# National Assessment Governing Board

## Ad Hoc Committee on Measures of Postsecondary Preparedness

**Thursday, May 17, 2018**

3:00 – 5:00 pm

**Research Question #3:**  
*Measures of Preparedness—Measures for What?*

## AGENDA

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**Informational Items:**

- Literature Review on Question 1: Work of the Future
- Final Report of Industry Expert Panel Meeting Notes

**Attachment E**
At the March 2018 meeting of the Ad Hoc Committee on Measures of Postsecondary Preparedness, the Governing Board staff were asked to research what actions were taken by states as a result of NAEP’s academic preparedness reporting. Executive Director Bill Bushaw agreed to explore this and noted that he expected limited findings on state behavior given the preparedness metric was reported at the national level only. He directed the Board’s communications contractor, Hatcher Group, to conduct a media scan to answer this question. What follows is the summary of their results.

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The Hatcher Group conducted a media scan using Google News and Vocus, and a general Google search, to determine whether there is evidence that states are making decisions about students’ readiness for college and careers based on NAEP’s academic preparedness measure.

**Media Results**

We searched using Google News from 2013 to the present and Vocus from 2016 to the present. The search terms all included “state” or “states” and the following:

- NAEP and academic preparedness measure (one result)
- NAEP and Grade 12 and college ready
- NAEP and Grade 12 and college preparedness
- NAEP and Grade 12 and college and careers
- NAEP and Grade 12 and proficient and college

The one article found under “NAEP and academic preparedness measure” was a June 24, 2014, Commentary in Education Week by David Driscoll, then-chair of the Governing Board discussing the 2013 released of the NAEP measure of academic preparedness.

“In early May, NAEP released new information on academic preparedness as well as the 12th grade NAEP results on reading and mathematics. The numbers show that 2013 performance in both of these critical subjects was unchanged from the last assessment year of 2009—in other words, there was academic stagnation.”

The other search terms, combined, turned up more than 1,000 articles. But we found no references to states using NAEP’s academic preparedness measure to make decisions about their own policies.

The Grade 12 NAEP scores received significant general media coverage, particularly after the release of the 2015 results.

We found a general National Public Radio blog post, “Most High School Seniors Aren’t College or Career Ready, Says ‘Nation’s Report Card’” from April 2016 on the 2015 NAEP results,
directly linking Grade 12 Proficient and college readiness. It quotes Governing Board member Andrew Ho. However, it doesn’t address whether states are using this measure.

We found an Atlanta Journal-Constitution article, “Disappointing 12th grade scores on Nation’s Report Card: Why aren’t reforms working?” from April 2016 that links the Grade 12 scores and college readiness to the effectiveness of past reform policies in Georgia. The article quotes Terry Mazany, then chair of the Governing Board. However, it does not address whether Georgia has used the measure to enact any new policies.

This article from the website FiveThirtyEight, “What We’re Missing In Measuring Who’s Ready For College,” questions the link between NAEP Grade 12 scores and college readiness. It presents different viewpoints about the best measures of college preparedness. The article does not address whether states are using this measure; it just discusses the validity of NAEP as a college preparedness measure.

One of the best overviews of the topic of how states are determining college preparedness was an Oct. 2, 2017, piece from Education Week, “A Guide to State ESSA Plans.” The guide makes no mention of NAEP Grade 12 results. This section is a quick overview of the types of “readiness measures” in various state plans:

“At least 35 states are incorporating some kind of postsecondary-readiness measure, whether that’s ACT scores, SAT scores, dual enrollment, Advanced Placement, career and technical education pathways, a mix of those factors, or something else. For instance, New York is looking at whether students enroll and pass advanced courses or earn college credit through dual enrollment. And Georgia is considering whether students earn credit through AP or International Baccalaureate courses, or a CTE certification.”

Policy-Related Reports

We also did a general Google search (non-media) of various key terms linking Grade 12 NAEP Proficiency and college readiness. This search turned up several academic papers that mention NAEP in this context, but no discussion of state-level activity to connect college preparedness and Grade 12 NAEP scores.

An additional Google search using “NAEP academic preparedness measure and states“ primarily returned links from NCES and the Governing Board itself.

The closest discussion of this issue was in a February 2017 report, “The College and Career Readiness of U.S. High School Graduates,” from Achieve, a Washington-based organization concerned with students’ academic preparation. Achieve does incorporate NAEP scores into its index for college and career readiness, but only state-level NAEP scores for students in grades 4 and 8.
We also looked for material from the Council of Chief School Officers, but a March 2017 report, “Destination Known: Valuing College AND Career Readiness in State Accountability Systems,” makes no mention of NAEP.

Another report, Science & Engineering Indicators 2018 from the National Science Board, incorporates a discussion of Grade 12 NAEP scores in relation to the ACT:

“Other measures of college readiness support the ACT findings. National Association of Educational Progress (NAEP) college-ready indicators provide readiness estimates based on a nationally representative sample of students. The National Assessment Governing Board (NAGB), which sets policy for NAEP, began using NAEP in 2013 to estimate the percentage of grade 12 students who possess the knowledge and skills in reading and mathematics that would make them academically prepared for first-year college coursework. NAGB conducted a decade of research to determine the NAEP scores students need to earn to demonstrate college readiness. According to results from the 2015 NAEP, an estimated 37% of twelfth graders were prepared for college-level coursework in mathematics (Kena et al. 2016), a finding similar to that of ACT and one that is echoed in Achieve Inc.’s 50-state analysis of student performance on college readiness indicators. Achieve found that, even in the highest performing state, only 42% of students were ready for college-level work in mathematics (Achieve Inc. 2016).”

Finally, the Thomas B. Fordham Institute’s Flypaper blog ran a post recently (Feb. 6, 2018) advocating for NAEP to begin regularly reporting state-by-state results at the twelfth-grade level. The post was authored by Chester E. Finn, Jr., Distinguished Senior Fellow and President Emeritus of the Thomas B. Fordham Institute. Finn writes:

“Now is the perfect time to resume reporting results for twelfth graders on a state-by-state basis and to do so on a regular cycle. ... Reading, writing, and math are the obvious subjects to do this with, but how great it would be also to report twelfth grade state results in other core subjects, particularly science and history!”

At this point, it seems that NAEP is part of the discussion of college readiness, but only to the degree that it’s linked to ACT scores or other more direct measures of readiness.
As part of meeting the charge of the Ad Hoc Committee on Measures of Postsecondary Preparedness, HumRRO organized and facilitated a meeting with a small number of higher education innovators. The purpose of this meeting was to elicit input from leaders and experts in higher education about (a) the jobs that will exist in 2030, (b) the skills that these jobs will require, and (c) the measures/indicators that would be needed to determine the status of elementary and secondary students with respect to these skills.

We were fortunate to assemble an exceptional panel of experts and leaders. The panel members included Dr. Sarah DeMark, Vice President of Academic Programs, Western Governors University; Dr. Pradeep Kotamraju, Bureau Chief, Career and Technical Education, Division of Community Colleges and Workforce Preparation, Iowa Department of Education; Mr. Michael Morsches, Dean of Learning Enrichment and College Readiness, Moraine Valley Community College; Dr. Yvette Mozie-Ross, Vice Provost for Enrollment Management and Planning, University of Maryland, Baltimore County; and Dr. Holly Zanville, Senior Advisor for Credentialing and Workforce Development, Lumina Foundation.

The meeting was held on April 19, 2018 in Chicago, Illinois. An overview of the National Assessment Governing Board and the charge of the Ad Hoc Committee on Measures of Postsecondary Preparedness, along with the agenda and logistical information for the meeting were sent to the panelists in advance of the meeting.

Thanos Patelis (HumRRO) opened the meeting and after quickly informing the group of some logistics, Terry Mazany, Ad Hoc Committee Chair, set the stage for the role of NAEP in the future, given the impact of technology on work as well as the economic and global context in which students enter the post-secondary world. He led the attendees through introductions. Thanos Patelis facilitated the meeting around the three areas of inquiry involving (a) the jobs of 2030, (b) the skills these jobs will require, and (c) the measures/indicators needed to measure these skills. Finally, Terry Mazany offered some concluding comments. The agenda and the list of all attendees is in Appendix A.

The purpose of this document is to summarize the themes and comments made by the panelists. The information in this report is meant to provide insight into the rich conversation and comments provided by the expert panelists.
The Future of the Workplace and Work

With experts representing higher education, the discussion of the future of the workplace and work focused on pathways to work, primarily through postsecondary education and training.

- **Strong partnerships are needed between 2- and 4-year institutions of higher education to facilitate students' transfer between schools.**
  - High school graduation projections show Hispanics are the fastest growing group\(^1\) and many of this group begin their postsecondary studies in community college.
  - Many students are graduating from high school with associate’s degrees obtained through early middle college programs and dual enrollment.

- **Colleges and universities must provide different, perhaps individualized, services to students who enter at different points on the pathway to a 4-year degree. Historically, 18-year-old high school graduates enter as freshmen with the services and support structure for the first year or two. Institutions are now called on to help a select group of high school graduates entering college with associate’s degrees, yet perhaps still needing wraparound services due to their youth. Other students may start and stop their education multiple times and attend several different institutions before graduating.**

- **More individualization in postsecondary education requires “policy by anomaly.”**
  - In developmental education, need to identify what students need and how to get it to them. Placing students on paths matching their goals raises retention rates.

- **Postsecondary institutions need to create pathways to develop agile employees who are open to lifelong learning.**

- **Postsecondary institutions need to partner with employers to identify education and training needs so that graduates possess the knowledge and skills needed for jobs.**
  - Look to information technology (IT) which is leading the way in defining job requirements and credentials for employees.
  - One of the panelists described a keynote presentation by the CEO from Chegg, Dan Rosensweig, describing the current disconnect between expectations and responsibilities of employers, higher education, and students. He illustrated this by placing each of the stakeholders at the vertices of a triangle with arrows facing outward indicating a lack of working together rather than arrows pointing inward, toward each other, signaling collaborative planning and working together toward similar goals.
  - Educators can be resistant to business models.

- **There are still barriers to postsecondary education. Although community colleges have an open policy (in some states students do not need a high school diploma to enroll in community college), students may find it difficult to pursue their desired major or to matriculate. Prerequisites and competitive admission in selected programs (e.g., healthcare) are barriers to entry.**
  - Similarly, some 4-year colleges guarantee admission to those with associate’s degrees, but cannot guarantee admission into specific programs due to enrollment capacity and accreditation requirements such as completion of specific coursework.
  - Some community college graduates are not prepared for 4-year colleges and universities because their 2-year institutions have limited qualifications for instructors and low standards for their graduates. Both of these factors could be a barrier to continued education.

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To prepare students for future jobs, we need vertical and horizontal articulation. For horizontal articulation, students need technical, academic, and employability skills (e.g., grit, self-understanding). For vertical articulation, the key is determining at what age/grade to start. High school staff say it needs to start in middle school; middle school staff say it needs to start in elementary school.

Lifetime or continuous learning will become the norm. Employees will need to continue to learn from different providers, from colleges/universities to specific training courses to experiential opportunities, throughout their lives. IT workers already face this with certifications in different technology and applications. Highly-regulated occupations will likely be the last ones to make changes.

Need a mechanism to validate training and experience as part of the pathway to a degree. More and more high school graduates are already working through the gig economy. Other students have jobs and families while attending college.

- Look to the military; they validate training as credits.
- Western Governors University (WGU) provides micro-credentials or badges as students achieve milestones to show the value of the program as students work toward their bachelor’s degree.
- Give students the ability to curate their work and educational experiences.

Expect the acquisition and use for knowledge and skills to flip. Currently, knowledge is the base foundation provided by formal education and we obtain skills as needed. In the future, skills will be the base and we will obtain knowledge as needed.

There is tension between an integrated approach providing a broad range of skills (academic, technical, and employment-oriented) and the business need for a narrow, specific set of skills to meet a skill shortage. One is too esoteric, the other too pragmatic.

Post-secondary institutions will not be the destination, but a vehicle for certifying student competencies.

Skills Needed in the Future

- Don’t teach students to do what a robot can do better.
  - Robots are better than humans at pattern recognition, repetitive tasks, etc. but they are not able to understand nuance of language, social relationships, or creativity.
  - It will be important for humans to connect domains.
  - McKinsey has developed a list of human skills such as empathy, planning, creativity, common sense, sense making, novel thinking, nuance of language, social relationships, etc. 2
- In addition to content or professional knowledge, students need:
  - practical transition skills
  - key learning skills and cognitive strategies
  - strong foundation of self-understanding and engagement strategies
  - critical thinking
  - affective mindset and skills
  - meta learning
  - financial literacy
  - information technology literacy
  - health and wellness literacy.

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Four-year institutions look for grit or persistence as a necessary skill for student success. Students with a solid foundation and grit should be able to succeed, whereas students with a strong foundation and no grit may not be able to handle the rigor of college.

Schools can provide learning and workplace skills.
- College experience courses for high school students.
- WGU offers eight synchronous online sessions with a small, facilitated cohort on skills such as self-efficacy, communication, and learning styles. In a pilot test with at-risk students, there were significant positive outcomes: performance on subsequent courses increased and retention went up. Some of the skills, including leadership and communication, were identified by the medical profession as ones missing in graduates. These skills not only make graduates better job candidates but also more resilient students.

Class attendance is the best predictor of success, as evidenced both by anecdote and research. Some colleges require attendance and initiate interventions if students do not attend class.
- There is a question of how to measure attendance for online courses. One approach is to look at student engagement using interaction data from Learning Management Systems (LMS).

Employers are looking for people who can work across left and right brains and are able to work with technology.

Consider where or why skills are needed to build awareness of how skills fit into work.

Students need to learn how to get “unstuck” when in a challenging situation.

**Measures of Skills in the Future**

Employers offer performance-based pay for high-value, high-priority credentials supporting ability to use skills.
- Students may demonstrate their skills through portfolios.
- Use blockchain\(^3\) to document achievements and portfolio.

Need new types of student assessment.
- Current ones focus too much on knowledge and not enough on skills, character, and meta learning.
- Most current assessments are unassisted, working alone. Need assisted assessments or hands-on performance assessments.

Create dashboards for parents and students to see skill attainment, including credentials.

Leading-edge assessments use simulation and are more applied, with problem solving scenarios that assess whether you can use knowledge.

Use micro credentials and then stack those credentials to meet employer-relevant needs.

There is a tension between broad versus specific measurement of skills.

Include all stakeholders in identifying what and how to measure skills.

Measuring college or postsecondary readiness is different than college or postsecondary success.

Some postsecondary institutions use transcripts, others don’t.
- Transcripts could provide an opportunity to leverage high school data for postsecondary instructors to know what students have done prior to college and to personalize postsecondary instruction.

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\(^3\) For information about blockchain: https://hbr.org/2017/01/the-truth-about-blockchain
o Expect seat time to be a less helpful measure from an industry perspective. They will be interested in a “transcript” with learning opportunities, perhaps using blockchain technology.
  o For transcripts to be useful to instructors, need a way to standardize them.
  o Need to include attendance on transcript.
  o Metrics of academic rigor exist with validity evidence provided to support their value in predicting college outcomes.

- Concern with the shelf life of measures such as SAT or ACT, course grades, etc. Are high school results as valid for older, returning students?
- Metrics should include student employment.
- Measures of service learning needed.

Reflections

Terry Mazany offered four reflections on the discussion:

1. We need to project all of the allied trends in society to 2030. Work is shifting to a gig economy. This will be the reality for 16- to 18-year-olds in 2030. We need to factor the expected changes in the economy of 2030 into the skills required to work in the future. Data is the new oil. Micro-credentialing and digital badges will more and more populate transcripts and portfolios.

2. Several paradigm shifts: (a) knowledge/skill flip, (b) everything has a developmental progression except technology, (c) the nontraditional student of today is the traditional student of tomorrow, (d) students as agents for themselves, and (e) a world where trust is collapsing in every venture except nonprofit ventures – blockchain as a key to build this trust.

3. We are in between systems. We need to maintain an ecological perspective of each part of the system and look at the reciprocal changing role of employers.

4. Role of NAEP: alignment of NAEP with Every Student Succeeds Act (ESSA) and its requirements, such as conditions of learning---we need to back-map this.
Appendix A: Meeting Agenda and Attendees

Expert Panel Meeting
National Assessment Governing Board
Ad Hoc Committee on Measures of Postsecondary Preparedness

April 19, 2018   |   Agenda

11:00 to 11:05 AM  Start Meeting
Thanos Patelis, Facilitator, HumRRO

11:05 to 11:15 AM  Welcome and Introductions
Terry Mazany, National Assessment Governing Board Member
Chair, Ad Hoc Committee on Measures of Postsecondary Preparedness

11:15 AM to 12:00 PM  Work of the Future
Thanos Patelis

Guiding Questions:
- What do you see as the postsecondary pathways that high school seniors graduating in 2030 will be choosing among? (11:15-11:40)
- Compared to now, what kind of trends do you see shaping postsecondary education in 2030? (11:40-12:00)

12:00 to 12:15 PM  Break to get lunch

12:15 to 1:00 PM  Skills for the Work of the Future
Thanos Patelis

Guiding Questions:
- How have postsecondary entrance expectations changed in recent years? (12:15-12:40)
- What types of competencies and content knowledge will graduating high school seniors need to be prepared for postsecondary pathways in 2030? (12:40-1:00)

1:00 to 1:45 PM  Measures of these Skills
Thanos Patelis

Guiding Questions:
- What measures do you see being used for these competencies?; What will require new or updated measurement tools? (1:00-1:20)
- What metrics would provide helpful information in the aggregate about the competencies of graduating high school seniors? (1:20-1:45)

1:45 to 2:00 PM  Final thoughts and concluding remarks
Terry Mazany
Attendees

Expert Panelists:
- Sarah DeMark, Vice President of Academic Programs, Western Governors University
- Pradeep Kotamraju, Bureau Chief, Career and Technical Education, Iowa Department of Education
- Michael Morsches, Dean of Learning Enrichment and College Readiness, Moraine Valley Community College
- Yvette Mozie-Ross, Vice Provost for Enrollment Management and Planning, University of Maryland, Baltimore County
- Holly Zanville, Senior Advisor for Credentialing and Workforce Development, Lumina Foundation

Governing Board Members:
- Terry Mazany, Chair, Ad Hoc Committee on Measures of Postsecondary Preparedness
- Dale Nowlin, Teacher and Mathematics Department Chair, Bartholomew Consolidated School Corporation, Columbus, Indiana
- Alice Peisch, Legislator, Massachusetts House of Representatives, Wellesley, Massachusetts
- Chasidy White, Director of Strategic Initiatives, Office of the Superintendent, Montgomery, Alabama

Governing Board Staff Members:
- Bill Bushaw, Executive Director
- Lisa Stooksberry, Deputy Executive Director
- Lily Clark, Assistant Director for Policy & Research

HumRRO Staff Members:
- Monica Gribben, Senior Staff Scientist
- Sunny Becker, Principal Staff Scientist
- Thanos Patelis, Principal Scientist
Expert Panelists

Sarah DeMark, Ph.D.
Vice President of Academic Programs
Western Governors University

Sarah DeMark joined nonprofit Western Governors University (WGU) in September 2014, and serves as the Vice President of Academic Programs, responsible for leading WGU's portfolio strategy as well as the design and development of the university's competency-based degrees, curriculum and assessments. This portfolio includes more than 50 programs, 600 courses, and nearly 1000 assessments.

Prior to joining WGU, DeMark spent more than 15 years at leading IT companies, serving in various leadership roles where she oversaw the strategy and execution of the design, development, and deployment of certification and curriculum-based assessment portfolios. Previously, she was an independent consultant working with state and local school districts, as well as working with The College Board on SAT and AP program evaluation.

DeMark is published in numerous journals and books and is a sought-after speaker. DeMark currently sits on ANSI's Personnel Certification Accreditation Committee, which serves to validate whether certification programs adhere to standards.

DeMark earned a Ph.D. in Educational Psychology (Measurement, Statistics, & Methodological Studies) from Arizona State University. DeMark earned B.S. degrees in both Elementary Education and Psychology from Vanderbilt University.
Pradeep Kotamraju, Ph.D.
Bureau Chief, Career and Technical Education
Division of Community Colleges and Workforce Preparation
Iowa Department of Education

Dr. Pradeep Kotamraju is currently the Bureau Chief, Career and Technical Education, Division of Community Colleges, Iowa Department of Education. As Iowa’s State Director for Career and Technical Education (CTE), he has leadership responsibility in managing those secondary and community college CTE programs that are funded through the Carl D. Perkins federal program. Previous to his current position as the Iowa CTE State Director, Dr. Pradeep Kotamraju has served the Deputy Director, National Research Center for Career and Technical Education (NRCCTE), University of Louisville, Louisville, Kentucky. Prior to that, he served as the System Director, Perkins, at the Minnesota State Colleges and Universities, Office of the Chancellor. Dr. Kotamraju has worked in several senior administrative positions in higher education and workforce development agencies in Minnesota.

Dr. Kotamraju has written several publications and monographs, and made numerous presentations, in the area of student success in career and technical education, workforce development in the United States, and, in the area of economic progress in the developing world. His research has included the examination of a variety of labor market information and workforce development issues that connect occupations, skills and careers, as individuals transitioned back and forth between employment and education. Dr. Kotamraju has been invited to participate on several statewide, regional and national committees that have focused on CTE programs, budget and finance, and accountability. Some of these committees have had even broader focus that places CTE right front and center when it comes to connecting education, workforce development, and economic development.

Before working in the public sector, Dr. Kotamraju taught college- and university-level Economics and Statistics at several higher education institutions in Minnesota and Kentucky. Dr. Kotamraju holds a Ph.D. in Economics from the University of Illinois. He received his Masters Degree in Economics from George Washington University, and his Bachelors in Economics from the University of Delhi, India.
Michael Morsches has worked in higher education for more than thirty years. His primary focus has been on developmental education and the transition from high school to college.

Michael currently serves as the Dean of Learning Enrichment and College Readiness at Moraine Valley Community College. He oversees the ABE/GED, ESL, developmental education, literacy volunteers, and tutoring programs. Michael has published numerous articles and handbooks on retention, student engagement, and teacher training in post-secondary institutions.
Yvette Mozie-Ross, Ph.D.
Vice Provost for Enrollment Management and Planning
University of Maryland, Baltimore County

Yvette Mozie-Ross, PhD, is Vice Provost for Enrollment Management and Planning at the University of Maryland, Baltimore County (UMBC). As Vice Provost, Dr. Mozie-Ross provides oversight and strategic planning for the areas of undergraduate admissions and orientation, financial aid and scholarships, academic and pre-professional advising, records and registration, and the student administration project (student information system). With a higher education career spanning over 25 years, she has served in numerous professional capacities including residence community director, coordinator of multicultural recruitment, assistant director for transfer recruitment and admissions, director of undergraduate admissions, and director of academic services (advising and registration). Dr. Mozie-Ross has served on various national and statewide committees and workgroups including the College Boards’ Commission for Transfer Policy and Practice, and the Maryland Higher Education Commission’s State Plan Writing Group on Access, Affordability and Completion. She has served on the university’s Strategic Planning Steering Committee and is currently serving as a member of the governing board for the Baltimore Collegetown Network, a consortium of 13 colleges in Baltimore, Maryland. Dr. Mozie-Ross frequently lends her expertise, both nationally and internationally, in the area of data analytics and leveraging analytics for institutional transformation. Dr. Mozie-Ross earned her bachelor’s degree from UMBC in 1988, her master’s degree from University of Maryland University College in 1994, and her doctorate in Education Policy and Leadership at the University of Maryland, College Park in 2011. Her dissertation research examined the academic and background characteristics of high school graduates who identified teachers as influential in their choice of college. Dr. Mozie-Ross enjoys spending time with her husband of 22 years and their 20-year old son. Her pass-time interests include family genealogical research and running.
Holly Zanville, Ph.D.
Senior Advisor for Credentialing and Workforce Development
at Lumina Foundation

Holly Zanville is Senior Advisor for Credentialing and Workforce Development at Lumina Foundation. She leads a new portfolio on Worker and Employer Engagement that focuses on building the capacity of educators and employers to scale and spread the best ideas in training, credentialing, and other workforce development strategies linked to postsecondary learning opportunities; and examining issues around the future of work and learning. Her work includes cultivation of networks and partnerships essential to the emerging new postsecondary learning system including Credential Engine, quality assurance efforts to ensure that credentials stand for high-quality learning, and networks for research and industry sector engagement. She previously led Lumina’s development of the national Connecting Credentials initiative, credential completion for returning adults with prior college/no credential, and statewide approaches to reverse-transfer degrees through the Credit When It’s Due initiative. Zanville received her Ph.D. in Educational Administration from the University of Minnesota; MA in English from the University of Wisconsin-Madison, and BA in English and Biology from Lindenwood University.
May 17, 2018 — Discussion of Measures of Preparedness

To explore the Strategic Vision priority to “Develop new approaches to measure the complex skills required for transition to postsecondary education and career,” (SV #10), the Ad Hoc Committee on Measures of Postsecondary Preparedness identified the following three research questions to guide its review of existing research and collection of expert testimony:

1. Work of the Future – Readiness for what?
2. Requisite Skills for Future Work – Skills for what?

At their March 2018 meeting, the ad hoc committee expressed the view that students graduating in 2030 will continue to need content knowledge in addition to the interpersonal and intrapersonal skills that are now considered critical for any postsecondary path. At the May meeting, the committee will continue to discuss what cognitive and non-cognitive skills students need, which will provide the foundation for addressing the third research question.

Following the committee’s discussion of the below topics, the Governing Board’s contractor HumRRO will prepare a report for the committee that identifies metrics from NCES, NAEP, and other sources which tap the skills the committee recommends capturing. This research may also help identify where there are no existing metrics for skills that the committee considers essential.

1. What subjects of knowledge are the most critical for postsecondary preparedness?
   - Reading
   - Mathematics
   - Science
   - Writing
   - US History
   - Civics
   - Geography
   - Economics
   - Technology and Engineering Literacy
   - Arts
   - Foreign Language
   - Financial Literacy
   - Other?

2. What interpersonal and intrapersonal skills are the most critical for postsecondary preparedness?
   - Collaboration
   - Creativity
   - Communication
   - Problem-solving
   - Adaptability
   - Perseverance
   - Critical thinking
   - Intellectual openness
   - Conflict Resolution
   - Inquiry
   - Self-efficacy
   - Leadership
   - Social and Emotional
   - Other?

3. Are there specific external data sources (beyond NAEP and NCES) that the Committee wants to include in its measure of postsecondary readiness (e.g. apprenticeships, workplace learning experiences, and industry recognized credentials)?
Preparedness Strategy: Working Draft for the Ad Hoc Committee’s Discussion on Next Steps

In August 2017 the National Assessment Governing Board commissioned the Ad Hoc Committee on Measures for Post-Secondary Preparedness to review existing research, collect expert testimony, and prepare recommendations for the Governing Board’s consideration to achieve Strategic Vision priority #10, which is to “Develop new approaches to measure the complex skills required for transition to postsecondary education and career.”

At the broadest level of policy, NAEP provides the platform to change the nation’s valuation of what is important in student learning and create a paradigm shift in what matters and gets measured. The National Assessment Governing Board has the opportunity to determine whether or not there is a compelling national interest that warrants changes in NAEP to signal such a shift. To effect such a change below are five proposed options that the committee can consider recommending, either singularly, or in combination (note that prior to finalizing any recommendation the committee will need to consult with NCES and gather information to determine feasibility):

1. **Career Preparedness Assessment**: Develop a new state and TUDA-level framework and assessment for career preparedness knowledge and skills that could be offered at 8th and/or 12th grade (possibly replacing the current NAEP grade 12 assessments with a single assessment to report a postsecondary preparedness measure at the state level).

2. **Assessment Alignment with Career Preparedness Indicators**: Restructure existing cognitive assessments to report results more aligned with a preparedness construct that considers economic demands and the numerous postsecondary pathways for students in the assessments of what 12th graders should know and be able to do.

3. **Contextual Variables**: Within the context of existing assessments, develop and include contextual questions that better capture dimensions of preparedness and contribute to changing the national narrative on what is important in student achievement by increasing the focus on contextual variables in reporting NAEP results.

4. **Special Studies of Career Preparedness Systems**: Much like NAEP’s transcript studies, conduct a special study of the provision of key policies and practices for career preparedness from a sample of schools, districts, and states (for example, partnering with New Skills for Youth to study the practices of the ten participating states).

5. **Other Data**: Serve as a vehicle to collect and report industry recognized credentials, workplace learning experiences, apprenticeships, etc. and broker data from various sources beyond NAEP to capture a wider range of achievement measures that are more reflective of, and customizable to, students’ learning ecosystems and pathways.
Work of the Future – 2030

Literature Review

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Work of the Future – 2030

Overview of Jobs of the Future

History shows major changes in the occupational landscape and pace of life with each of the four industrial revolutions (Vale, 2016). The first industrial revolution, characterized by the steam engine, led to greater dispersal of jobs as those requiring machine power were not restricted to locations with wind or flowing water to power mills. Electricity and mass production brought about the second industrial revolution, leading to a surge in manufacturing jobs and supporting industries such as transportation, sales, and business. The advent of the digtal age, the third industrial revolution, gave us the ability to collect and process massive amounts of data quickly and opened up new jobs related to computers and technology innovation. Now, we are entering the fourth industrial revolution, highlighted by the internet of things and artificial intelligence (Choi, 2017; Vale, 2016).

Throughout history, the introduction of new technologies has led to changes in jobs, from replacing workers with machines to changing how people perform their job to creating new occupations. According to futurists, this trend will continue. Policy analysts predict up to 47 percent of jobs in the United States could be automated between 2017–2037 (Bakhshi, Downing, Osborne, & Schneider, 2017; Houser, 2017). Opportunities will become limited in many industries, mostly in low- or medium-skill jobs, as automation reduces the number of humans needed to perform routine tasks. Further, business leaders and strategists predict that 50 percent of the occupations of 2014 will no longer exist in 2025 (Andrew, Ip, & Worthington, 2014). Technology, automation, artificial intelligence, and other innovations that have yet to be developed will lead to new occupations and jobs.

Atkinson and Wu (2017) take a different perspective of technological disruption, suggesting that others have based their doomsday predictions of rampant job loss on “faulty logic and erroneous empirical analysis.” Instead, they calculate, from 2010 to 2015, approximately six technology-related jobs were created for every 10 lost, the lowest share of jobs lost to technology of any period since 1950 to 1960.

While there will likely be changes in jobs and occupations of the future, what those changes will be, the extent and pace of changes, and the impact on employees entering or currently in the workforce are equivocal. In this report, we review the research related to potential changes in the workplace and highlight forecasts of jobs of the future.

Projections of Shifts in Jobs

Prediction of widespread unemployment due to technological advances is nothing new. For example, in the 1930’s, John Maynard Keynes predicted large-scale job loss associated with new technologies (as cited in Frey & Osborne, 2013). Recently in the United States, automation has been replacing jobs faster than it can create them (Atkinson & Wu, 2017; Brynjolfsson & McAfee, 2011), although perhaps not as quickly as some suggest. Autor, Levy, and Murnane (2003) found that as industries use automated technology to reduce the cost of performing routine cognitive and manual tasks, they hire more people to perform nonroutine cognitive tasks.

The occupations in which people are or will be employed are expected to shift, but this does not necessarily mean current jobs will be totally eliminated. As Manyika (2017a) reports, at least 30 percent of activities for most occupations could be automated using current technology.
Assuming in many current occupations certain activities or tasks will be automated, current jobs will change and more people will need to work with technology. Although some employees may lose their jobs because automation will drastically eliminate the need for human skills, integration of technology will help other workers perform their job better or enable them to be more efficient or productive. For still other workers, the demand for their skills may increase or the nature of what they do and how they accomplish tasks at work will change.

**O*NET Projections**

O*NET OnLine (National Center for O*NET Development, 2018) is a rich source of “detailed descriptions of the world of work.” There is a wealth of data available to those looking for work or interested in changing careers, as well as support for workforce development and human resources professionals, researchers, and policy analysts.

Using 2016–2026 employment projections from the Bureau of Labor Statistics, O*NET includes a set of Bright Outlook occupations. Twelve of the Bright Outlook occupation categories (including 20 distinct occupations) are expected to grow rapidly with an employment increase of 10% or more and are forecasted to have 100,000 or more job openings between 2016 and 2026 (see Table 1). O*NET identifies occupations linked to the green economy, focused on reducing environmental risks and initiating sustainable development without degrading the environment. Green jobs identified in O*NET are those where changes are expected in job demand, including work requirements such as tasks performed or worker qualifications such as knowledge, skills, and credentials needed for employment in these positions.

**Table 1. O*NET Bright Outlook Occupations with Rapid Growth and Numerous Job Openings**

<table>
<thead>
<tr>
<th>Major Occupation Group</th>
<th>Occupation Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and Financial Operations</td>
<td>Accountants and Auditors</td>
</tr>
<tr>
<td>Education, Training, and Library</td>
<td>Teachers and Instructors, All Other (includes Tutors)</td>
</tr>
<tr>
<td>Healthcare Practitioners</td>
<td>Registered Nurses (includes Acute Care Nurses, Advanced Practice Psychiatric Nurses, Critical Care Nurses, and Clinical Nurse Specialists)</td>
</tr>
<tr>
<td>Healthcare Support</td>
<td>Home Health Aides</td>
</tr>
<tr>
<td></td>
<td>Nursing Assistants</td>
</tr>
<tr>
<td>Personal Care and Service</td>
<td>Personal Care Aides</td>
</tr>
<tr>
<td>Food Preparation and Serving</td>
<td>Cooks, Restaurant</td>
</tr>
<tr>
<td></td>
<td>Combined Food Preparation and Servicing Workers, Including Fast Food</td>
</tr>
<tr>
<td>Building and Grounds Cleaning and Maintenance</td>
<td>Janitors and Cleaners, Except Maids and Housekeeping Cleaners</td>
</tr>
<tr>
<td>Sales</td>
<td>Landscaping and Groundskeeping Workers</td>
</tr>
<tr>
<td></td>
<td>Sales Representatives, Services, All Other (includes Energy Brokers)</td>
</tr>
<tr>
<td>Construction and Extraction</td>
<td>Construction Laborers</td>
</tr>
</tbody>
</table>

Source: O*NET OnLine

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Work of the Future – 2030
Several researchers have mined the O*NET data to make predictions about the future of jobs, identifying ones expected to increase and ones to decrease in the future. Bakhshi et al. (2017) used O*NET’s importance ratings in foresight exercises to generate input for a machine learning model, with the goal of mapping O*NET knowledge, skills, and abilities variables to future occupational demands. In the United States, the model predicts increased demand for teachers from pre-school through high school and post-secondary. Animal care workers, legal professionals, and engineers round out the top five occupations with expected increased demand.

**Jobs Expected to be Lost or to Decrease**

Job loss and decrease due to technology is evident all around us. Grocery stores offer multiple lanes where customers scan their own purchases, monitored by a single cashier. Only a few years ago there were multiple cashiers serving the customers. Financial institutions offer more and more automated functions such that their customers need to interface with a person less often than ever before. For example, customers can now use a mobile application to deposit a physical check without leaving home. Andrew, Ip, and Worthington (2014) predict customer work will disappear and many middle management positions will no longer exist in 2025. Frey and Osborne (2013) describe greater use of data and algorithms to computerize cognitive tasks such as fraud detection, health care diagnostics, legal document review, and financial advice. With automation expanding into more cognitively-advanced occupations, demand for individuals with certain professional skills, such as financial analysts and law clerks, are predicted to decline.

Frey and Osborne (2013) used O*NET data to study how susceptible jobs are to computerization. Using data for 702 occupations, they modeled the potential for jobs to be automated within 10–20 years. Their model predicted workers are most likely to be replaced with technology in occupations that involve transportation and logistics, office and administrative support, manufacturing, and service.

Bakhshi et al. (2017) did not use their model to predict decreased demand, but rather to predict low probability of increased demand. Those in skilled and semi-skilled trades, such as woodworkers, printing workers, metal and plastic workers, and other production occupations, were at the top of the future low demand list. Financial clerks received low ratings comparable to those in the trades.

**Jobs Expected to Increase**

Bakhshi et al. (2017) expect growth in professional occupations that require creative, digital, design, and engineering expertise. In addition to creativity, Osborne and Frey (n.d.) suggest growth in jobs that require social intelligence and manipulation, such as iOS and Android developers, social media interns, big data architects, data scientists, user interface/user experience (UI/UX) designers, Zumba instructors, and beachbody coaches. Further, strong interest in environmental sustainability is expected to benefit individuals employed in architectural and green occupations (Bakhshi et al.). Also, they foresee increased roles for people specializing in work reorganization, such as management analysts and training specialists.
New Jobs to be Created

Jobs requiring creative intelligence and social and emotional intelligence are predicted to be added to the economy, as are positions requiring the ability to leverage artificial intelligence (AI; Andrew, Ip, & Worthington, 2014). New jobs using creative or social and emotional intelligence or AI are expected to be more fulfilling than current jobs.

Generally, specific details about future jobs are scarce. Wagner (2011) discusses 70 jobs likely to exist in 2030. These jobs will be created through (a) retrofitting or adding new skills to existing jobs, (b) blending or combining functions from different jobs or industries, and (c) problem solving or creating new jobs to solve a problem. Types of jobs that might be added through retrofitting could support commercial space travel, such as space construction, space suit repair, space junk recyclers, astro-teachers, and exozooologists. By blending careers, the future might include environmental health nursing to treat patients exposed to toxins. To provide authoritative news in an era when anyone can publish online may lead to authority-journalists who specialize in an occupation and are cross-trained to report about their field. To solve future problems, we may hire digital footprint managers or digital archaeologists or future-guides. Wagner mentions occupations in the sustainability and green energy industries may be added, such as green career coach, autonomous vehicle operator, energy harvester, drone dispatcher, smart car interior designer, smart road designer/engineer, and smart road sensor control monitor/analyst. Gordon (2011) predicts there will be new careers inspired by nanotechnology, such as bio-botic physicians and bio-botist assistants to integrate biological functionalities and implanted nano-robotics to extend life.

Drivers of Change

The literature discusses three major drivers of projected shifts in jobs of the future—technology (Frey & Osborne, 2013), artificial intelligence (Manyika, 2017b), and social changes (Bakhshi et al., 2017; Manyika, 2017a). With changes in jobs come adjustments in the workplace. Experts predict that workplace culture and processes will shift as well as career paths and how people learn the necessary job skills needed to perform jobs of the future.

Impact of Technology

Literature is replete with observations of the accelerating impacts of technology in recent decades, including predictions this acceleration will continue. Baby boomers remember a world when communication required a phone call that was timed when both parties were available to speak or a letter that took days to be delivered; researching a topic involved going to the library or referencing a home copy of encyclopedia volumes; and getting a flat tire meant a hike to find a pay phone. Today's young people are digital natives. They cannot imagine a world before e-mail allowed asynchronous communication; the internet offered a wealth of instantaneous information at one’s fingertips; and cell phones connected individuals to worlds beyond measure. The explosion of technology is expanding in multiple directions—and quickly.

Bakhshi et al. (2017) employed an innovative approach to predicting job trends by first paneling experts in “foresight workshops” and then inputting their expert judgments into a machine learning system. Their analysis of the experts’ judgments identified three key trends in technological change. First, fears about the impact of automation on employment are enduring. Second, estimates of the impact of future automation range from 9–47 percent of U.S. employment. Third, technology can amplify human performance and bring about new occupations and sectors.
For its 21st annual survey of CEOs worldwide, PwC interviewed 1,293 CEOs in 85 countries, including 104 from the United States, in October and November 2017 (Ryan, Sapin, Rao, & Ampil, 2018).

Based on these interviews, U.S. CEOs were hiring for broadly relevant digital skills and collaborative, creative, and efficient work styles. About two-thirds (63%) of those who were hiring found it more difficult to identify qualified workers than before. Responses to this same survey indicated that artificial intelligence (AI) will be the innovation of the next two decades. CEOs predict that many workers will need AI literacy.

One of the challenges of a rapidly changing work environment is the ability of workers to keep pace. While new entrants into the workforce will grow up and attend school immersed in state-of-the-art technology, continued innovation ensures even these digital natives—those who have an advantage over older, digital immigrants who completed school before digital technology became omnipresent—will require ongoing training to stay current on technological knowledge, awareness, and skills. Employees who joined the job market prior to many of the current technological advances are already challenged with staying up to date. Two approaches to keeping tenured employees abreast of the latest technological developments are upskilling and reskilling.

**Upskilling**

When an employee upskills, that individual learns new skills to improve performance on the job or to adapt to new requirements of the job. Upskilling has the advantage of retaining experienced employees, a positive outcome as these employees are a known commodity to the employer, absent the risks of employing a new hire who may not be a good fit. Knowledge of corporate procedures, norms, and expectations eliminate the need for orientation and start-up time, and reduce the probability of missteps. Retaining seasoned employees also supports the maintenance of institutional memory, which can be crucial as an organization evolves and grows.

Training to upskill employees may be sought by the employee, imposed by the employer, or both. The PwC’s Workplace of the Future study found three-quarters of respondents expressed willingness to update their own skills. At the same time, most responding CEOs acknowledged an ongoing responsibility to upskill their employees (Ryan et al., 2018).

PwC’s Annual Global CEO Survey specifically investigated the employer’s perspective on upskilling. Nearly two-fifths (39%) of respondents reported initiating or using continuous learning initiatives to provide development paths for employees to gain skills.

**Reskilling**

When an occupation becomes obsolete or the changing nature of the position no longer suits an employee, reskilling may be in order. More disruptive than upskilling, reskilling is training an employee to perform an entirely different job.

Results from PwC’s annual survey of CEOs indicate companies that “reinvent their own talent” by reskilling their employees will have an edge by creating pathways for employees to better contribute to data-driven initiatives, which may lower costs and improve the customer experience among other impacts (Ryan et al., 2018). However, the U.S. lags other large economies (e.g., Germany, China, Japan) in assuming responsibility for retraining after
automation (i.e., robots and AI) has been introduced into a job. The authors conclude that, while automation will result in job losses, over time those will be generally offset by new jobs. They note that “retraining workers to work with the support of AI will be important to future economic success” (Ryan et al., 2018, p. 15).

**Working with Data**

Alec Ross, author of Industries of the Future, provides an historical perspective of the workplace. He describes land as the raw materials of the agricultural age, followed by iron in the industrial age, and data in the information age. He posits that whoever owns, controls, and/or can harvest meaning from data will define the future workplace. Ross (2016) emphasizes the sheer quantity of data being produced in recent history and the opportunity for data analytics to mine those data. For example, he notes that “90 percent of the world’s digital data has been generated over the last two years” (page 154). He opines that the sum of “all data from paintings on cave walls through 2003, we now produce every two days” (Ross, 2017).

PwC issued a report on the workforce of the future, using findings from a survey of 10,000 people in China, India, Germany, the United Kingdom, and the United States on how they think the workplace will evolve. From the survey findings, the authors developed four “Worlds of Work” for 2030 to describe hypothetical future scenarios defined along two continuums: collectivism and fragmentation. Authors concluded the increasing use of digital platforms and AI mean data are key. With augmented intelligence, humans and machines collaborate to make decisions. Uniquely human traits of emotional intelligence, creativity, persuasion, and innovation become more valuable. Adaptability will become increasingly important as work changes (PwC, 2017).

**Human-Technology Interactions**

Not only are data produced and stored at astounding rates, but individual access to such data through technology is expanding. Ross (2017) asserted that 20 billion networked devices were in circulation in 2017. He projected this number will reach 45 billion in 2020. This growth will likely not produce a steady expansion across all markets, but rather result in bursts of growth in traditional areas that have not been as impacted by the digital economy, such as transportation or mining.

PwC’s Annual Global CEO Survey predicts that businesses will initiate upskilling initiatives to teach employees the skills they need to augment their own work with the support of technology. The authors contend that companies will infuse AI into all aspects of their business, not just technology-related areas (Ryan et al., 2018).

**New Technology Jobs**

Technology jobs such as software engineers are on the rise, but two other trends may result in new technology jobs. First, the blending of AI technology with a human component, or augmented intelligence, may open opportunities for technology-enhanced versions of jobs that are available today (PwC, 2017).

Second, Ross (2016) points out an increasingly popular conviction that the opportunities of the future will no longer rigidly distinguish technical fields from liberal arts or humanities. He suggests hybrid studies will become more prevalent, such as a combination historian/electrical engineer or political scientist/computer scientist. He describes the thinking of Toomas Ives,
President of Estonia: “…domains previously occupied only by people with backgrounds in the liberal arts, like government, will become increasingly occupied by people with more background knowledge in science and technology” (page 246).

**Impact of Artificial Intelligence**

**Types of Artificial Intelligence**

Although people may mean different things when they refer to artificial intelligence (AI), they generally mean the use of computers to perform tasks that require cognition and learning without programming the steps of the task. Often, AI is used to refer to machine learning, “where computers are taught or self learn how to recognize things” (Shaw, 2017). Bughin et al. (2017) describe other types of AI, including computer vision, autonomous vehicles, natural language, smart robotics, and virtual agents.

Machine learning is intensive, for the humans who must provide the “training data” and for the computer to process the information. Shaw notes that machine learning has many applications, such as predicting nefarious behavior or mechanical breakdown and identifying possible disease in 3D radiology images. Research is underway to explore the use of AI to make machine learning more efficient and accurate.

Shaw expects computer vision, using cameras to infer what they are seeing, to become the most prevalent type of sensor. Computer vision will be integral for self-driving cars and other autonomous vehicles such as self-driving trucks, buses, trains, and ships. Autonomous flying drones, which may be used for package delivery or to aid in aerial search and rescue, also will benefit from computer vision.

Natural language processors are familiar to many as they ask Siri for directions or to settle a debate. Smart home devices such as Google Home or Alexa are natural language processors. Once these devices understand what a person has said or written, Shaw states that a virtual agent is the next step. The virtual agent can help the human, provide financial advice, perform basic health diagnosis, or guide an individual through steps of an activity or job. Smart robotics are in use today, especially in manufacturing. Shaw expects robotics to become more prevalent in medicine, cleaning, stocking, agriculture, and food service in the future.

Machine learning is but one way of many to categorize AI. Hintze (2016) defines AI using a hierarchy from type I-reactive machines (e.g., Deep Blue, IBM’s chess supercomputer) to type II-limited memory (e.g., self-driving cars monitor information over time) to type III-theory of mind (e.g., understanding that thoughts and emotions affect behavior) to type IV-self-awareness (e.g., being aware of oneself).

**New Artificial Intelligence Jobs**

Research continues to advance AI (Bughin et al., 2017; Hintze, 2016; Shaw, 2017), with the implication that jobs developing and studying AI will continue to grow as the technology is incorporated into more daily life routines. Research firm Gartner, as cited in Singh (2017), predicts by 2020 more jobs will be created by the expansion of AI than will be lost. They estimate, that although AI will be responsible for the loss of 1.8 million jobs between 2018 and 2020, AI will create 2.3 million jobs. Healthcare, the public sector, and education will lead the way in incorporating AI into their sectors.
Increasing use of digital platforms and AI mean data will be key to creating new AI jobs (PwC, 2017). With augmented intelligence, humans and machines must collaborate to make decisions. Singh (2017) expects one in five workers will rely on AI to assist them in their jobs by 2022. It will be important for people to learn to work with and alongside AI machines.

**Impact of Social Changes**

**Globalization**

Globalization refers to the increasing interconnectedness of the world, both economically and politically. Along with automation, globalization is viewed as one of the main factors shaping the future workforce (Bernstein, 2016; Simon, 2016).

Companies operating on an international scale may have financial incentive to move jobs from the U.S. to other countries. This has been demonstrated historically through the loss of low-skilled manufacturing jobs due to offshoring (Hatzichronoglou, 2005). Today, higher skilled jobs also run the risk of offshoring, including computer-oriented science, technology, engineering, and mathematics (STEM) jobs (Lim, 2016).

Technological advances are closely linked with globalization’s impacts on the workforce. “Labor-linking” technology allows geographically dispersed people to vie for the same job, creating a competitive environment that could potentially drive wages down (Basu, 2016). However, there remain numerous higher-skilled jobs that are less subject to this threat, particularly those in healthcare and service industries that require face-to-face interactions (Blinder, 2007).

The potential for interaction with clients, customers, and coworkers from across the globe has implications for the skills that are valuable as well as valued. For example, employees may find it easier to negotiate the workplace when they have the skills needed to communicate effectively with geographically dispersed people from a range of sociocultural backgrounds. Employers are increasingly recognizing the value of cultural competence and communication skills among new hires (Vozza, 2016), especially when those skills are needed to perform future jobs that involve interaction on a global scale.

**Environmental Sustainability**

Environmental policies have long been linked to the reduction of jobs in specific industries (e.g., coal), though a causal link is up for debate (Morgenstern, Pizer, and Shih, 2001). The availability of jobs in such industries in the U.S. may in fact be limited by a decreased demand for fossil fuels that has resulted from advances in energy efficiency technology (Magill, 2017). Regardless of the mechanism at work, there is reason to believe the jobs of the future will continue to be shaped by both policy and consumer behavior related to environmental sustainability.

Beyond contributing to the obsolescence of some jobs, the focus on environmental sustainability continues to create new jobs and to change jobs that currently exist. Job opportunities for innovation related to environmental sustainability may increase as individuals and corporations alike seek to reduce energy consumption and waste (Bakhshi, Downing, Osborne, & Schneider, 2017). Companies that are changing practices to reduce their environmental footprint may create jobs for “sustainability professionals” who will take on the role of managing company resources (Hamilton, 2012). The National Center for O*NET Development has identified green economic sectors, green increased demand occupations, green enhanced skills occupations,
and green new and emerging (N&E) occupations, many of which will likely boast increased job opportunities in coming years. Green enhanced skill jobs are those in the existing occupation that require significant changes due to the impact of the increased focus on environmental sustainability (O*NET, 2018).

**Demographic and Population Patterns**

As of 2016, foreign-born workers constituted nearly 17% of the U.S. labor force (Bureau of Labor Statistics, 2017). By 2060, approximately 20% of the total national population is expected to be foreign-born (Colby & Ortman, 2015). Some raise concerns about the potential loss of jobs by American-born workers to immigrants (Hoban, 2017). Others argue the rising immigrant population will increase opportunities for U.S.-born workers, as immigrants frequently perform low-skilled jobs that are complementary to, and increase the productivity of, work performed by other Americans (Greenstone & Looney, 2012). However, many immigrants also hold advanced degrees, particularly in STEM fields (Solis, 2011), and could therefore play a crucial role in meeting the demand for highly skilled workers.

As working Baby Boomers draw closer to retirement age, there is concern over the loss of the knowledge and skills of the overall labor pool (Burke & Ng, 2006). Globally, the ratio of non-working age people to working age people appears to be on the rise (Bakhshi, Downing, Osborne, & Schneider, 2017). This trend may be counterbalanced by policy changes that raise retirement ages or provide incentives for older workers to remain on the job (Lerman & Schmidt, 1999).

The overall aging of the population has implications for available jobs. Jobs in healthcare and the production of goods and services targeting the needs of older citizens are on the rise (Singh, 2015). However, the influx of highly-educated Millennials into the workforce has its own implications. These workers are anticipated to bring a new set of expectations of their employers, including demands for improved working conditions and human resources policies (National Academies of Sciences, Engineering, and Medicine, 2017). At the same time, there is rising concern regarding this full subpopulation’s preparedness with the skills required in the ever-changing world of work (KRC Research, 2014).

**Education and Training**

It has been estimated that most children entering primary schools today will work in job types and roles that don’t yet exist and that will be characterized by the need for not only technological, but also social and analytical skills (World Economic Forum, 2016). It is anticipated workers of the future will hold an increasing number of jobs over their lifetime (Pompa, 2015). These factors, coupled with increasingly rapid technological change, will necessitate a continuous process of education and training throughout these future workers’ careers (Karoly & Panis, 2004). This suggests the need for consideration of both the education and training offered to students prior to their entry into the paid labor force, as well as how systems for continued education and training will be implemented and sustained.

Numerous innovative approaches to preparing students with the in-demand middle level skills needed to perform jobs of the future are expanding in their implementation. Career and technical education (CTE) programs, apprenticeships, early college high schools, and career academies are among the approaches that seek to bolster the skill levels of Americans entering the workforce for the first time (Joint Economic Committee Democrats, 2018). On-the-job training (OJT) models are another innovative approach that provides incentives to employers to
hire lower-skilled workers and offer them targeted training while they engage in paid labor, as well as offer continued training to allow for career advancement (Kobes, 2013).

**Equity Issues**

Many anticipate the trends of globalization and automation will lead to increasing inequality, as wages for highly skilled workers rise while low- and unskilled workers will compete with both automation and workers located in other countries (The Foundation for Young Australians, 2017). Other areas of concern regarding equity in the workplace relate to gender and age. Women who seek to both parent and work continue to face potential wage reductions and loss of skill development when they take time off for family leave (O’Marah, 2018). Some anticipate women will be disproportionately impacted by job losses due to automation (Hayasaki, 2017). Aging workers may face threats to their continued employment over issues related to healthcare costs and age-related disabilities (National Bureau of Economic Research, 2018).

**New Social-Oriented Jobs**

Futurists envision new positions will be created to do work that has never been done before. Most of these jobs will develop in response to shifts in the marketplace or they will be created because of advancing technologies. Envisioned jobs include those that harness the power of social media to create tailored experiences for customers or clients (Wagner, 2010). With more companies using social media to connect with customers and to expand their presence in the market, employees’ experience with and understanding of social media will be increasingly valued by employers (Kumar, Bezawada, Rishika, Janakiraman, & Kannan, 2016). Companies and organizations will need to monitor, maintain, and improve their online presence, and new positions will likely be created for that purpose (University of Kent, 2018).

**Workplace of the Future**

When examining the workplace of the future, Frey and Osborne (2013) convened human experts in machine learning to classify a subset of jobs according to the likelihood of their “automatability.” Through analysis of O*NET variables as proxies for three irreplaceable attributes (i.e., perception and manipulation, creative intelligence, and social intelligence) they developed a model to predict the automatability of the full set of O*NET occupations. Results indicated that 47 percent of U.S. employment can be classified as high risk for automation within the next decade or so.

The Guardian’s Workplace Benefits Study (2017) defines four top trends impacting the workforce in 2018 and beyond. Each of these trends is related to technology:

- Technology is enabling an on-demand workforce;
- Automation is requiring an enhancement of workforce skillsets;
- Employers are reinventing talent recruitment; and
- Varying workplace demographics require different strategies for adoption.
Workplace Culture

Agile Workforce

As organizations are required to respond quickly to changes in an increasingly globalized and technologically advanced world, they seek an agile workforce that is similarly capable of responding to unanticipated change with speed and flexibility (Breu, Hemingway, Strathern & Bridger, 2001). Workers of the future may be expected to rotate among a variety of roles and tasks, as employers seek to find the skills needed for a specific task at a particular time (Wadors, 2018). As companies leverage a variety of work models (e.g., ad hoc teams, crowdsourcing, independent contractors) to meet their needs, workers may find themselves entering into many different types of nontraditional work arrangements (Green, 2014). Andrew, Ip, and Worthington (2014) expect an increase in distributed work places. Continual reskilling will be a key element in sustaining high levels of agility (Lyons, Blitz, & Whittall, 2017).

Less Structure and Predictability

Careers have been traditionally viewed as a progression of jobs, often upward through a predictable, hierarchical structure (Lyons, Schweitzer, & Ng, 2014). Careers of the future will likely unfold in less hierarchically structured environments, where there will be increased interconnectedness among departments and where individuals may assume different job roles depending on the context of the work at hand (Heerwagen, 2016). Job tasks themselves are expected to be less structured and predictable as new technologies replace once rote and predictable duties with ones that require abstract thinking and flexibility (National Academies of Sciences, Engineering, and Medicine, 2017).

Sharing Economy

More and more, modern day consumers and workers engage in short-term economic transactions around services that involve sharing some material good (e.g., car, living space) or skill for monetary compensation (Sundararajan, 2016). Also referred to as the gig economy, platform economy, access economy, or collaborative consumption, this sharing economy is anticipated to increase exponentially over the coming decades (Yaraghi & Ravi, 2016). Such work arrangements have both potential positive and negative consequences for workers of the future. It can be argued that individuals will be empowered by the sharing economy to go into business for themselves and gain returns on their assets. On the other hand, the sharing economy removes protections that workers have enjoyed under more traditional work arrangements (Lamberton & Rose, 2012).

Continuous Learning

McKinsey & Company (2017) recommend that workers of the future be prepared to be lifelong learners. McKinsey Global Institute (MGI) partner Susan Lund explained, “For young people today, what’s clear is that they’re going to need to continue to learn throughout their lifetime. The idea that you get an education when you’re young and then you stop and you go and work for 40 or 50 years with that educational training and that’s it—that’s over. All of us are going to have to continue to adapt, get new skills, and possibly go back for different types of training and credentials. What’s very clear is that what our kids need to do is learn how to learn and become very flexible and adaptable.”
Guardian (2017) recommends that employers address the need for continuous learning through experiential, retraining, and cross-training programs, as well as mentoring, e-learning opportunities, and tuition assistance.

Ross (2016) opines the U.S. adoption of free education until the age of 18 was appropriate as long as a high school graduate could get a job in a “port, factory, mine or mill—a middle class job.” However, in the information age, he suggests we know the pace of change demands that we be lifelong learners.

Flexible and Non-Traditional Career Paths

Predictions regarding future career paths are wide ranging. Popular “wisdom” has long asserted that younger generations no longer expect to join an employer after high school or college and stay with that same employer until retirement. Lyons, Schweitzer & Ng (2015) analyzed the career mobility patterns of four generations and found that job mobility increased with each successive generation. Specifically, “The magnitude of the differences was large, as Millennials [born 1980 or later] had almost twice as many job and organizational moves per year as the generation Xers [1965-1979], almost three times as many as the Boomers [1946-1964], and 4.5 times as many as the Matures [born prior to 1946]” (page 16). However, this change in job mobility does not reflect an increase in employee turnover from one employer to another, but rather increased movement through various positions within a company. They postulate that technology, among other factors, may make some positions obsolete. The authors conclude the traditional career model is still strong and the “oft-cited truisms about the ‘new’ or ‘modern’ careers may be exaggerated” (page 18).

Intuit & Emergent Research (2017) predict that by 2021, 9.2 million American workers will derive at least some of their income as independent contractors operating within a “gig economy”—situations in which organizations establish short-term contracts on an as-needed basis. This is a substantial growth projection relative to the 3.9 million in 2016. McKinsey Global Institute (2016) estimates that 20–30 percent of individuals of working age in the U.S. and the European Union conduct independent work.

This trend is facilitated by technology that allows a job incumbent to be geographically distant from the employer; the advantages to an organization of selecting the best candidates for a given project, without a long-term commitment; and the ability to increase and decrease staff levels as demand warrants. This is further enabled by current and planned features in job-employee matching software such as Monster.com, Aftercollege.com, and Taskrabbit and networking sites such as LinkedIn (Brynjolfsson & McAfee, 2016).

Interdisciplinary Teams

Based on research by Burkus (2016), some organizations encourage employees to engage in more face-to-face communication in an effort to increase problem solving and decision making efficiency (as cited in Colbert, Yee, & George, 2016). As a result, workplaces evolve to provide more flexible space for collaborating and working in teams (Giang, 2015). Experts from Unum Limited’s Futures100 network (2014) foresee more conversation and debate, either face-to-face or on conversation-based platforms. Employees will need to blend skills and disciplines when working with others. They will collaborate with each other rather than compete. Workers will need listening skills and to display empathy, and build relationships to enable collaborative and interdisciplinary ventures.
Summary of Themes of Work and Workplace of the Future

When it comes to work of the future, change is the only certainty. However, this review of relevant literature points to some overarching themes that provide a solid base for making predictions about the world of work that today’s kindergartners will need in 2030 when they graduate from high school. This world will likely look very different from the world of work their parents were prepared for, both in terms of the available jobs and the work environment in which those jobs are carried out.

Jobs of the future will undoubtedly involve technology. From searching job openings, to performing job tasks, to receiving professional development, interacting with new and emerging technologies will be a distinctive feature of future jobs. Fields that had previously been quite separate may be blended in new ways, and existing jobs may be blended with new technologies to create positions we’ve never seen (think: space junk recyclers!).

The high school graduates of 2030 will set out on a career pathway characterized by change. Whether they work independently through the gig economy, or move among multiple employers or across multiple departments or projects, workers of the future will likely find themselves part of an increasingly diverse and dispersed workforce. Jobs will be continually evolving to meet changing demands and to incorporate the latest innovations. Ongoing training will be a necessary component of future jobs. Employees will need to adapt and embrace life-long learning to be successful in the workplace.

With some sense of what the future holds for work and the workplace, it becomes clear expected changes in jobs and job environments will correspond to changes in associated skills. A key next step to ensuring that students graduate high school in 2030 prepared for the next step on their postsecondary pathway is to identify the skills and abilities needed to successfully perform the jobs of the future.
References


Notes of the Expert Panel Meeting Representing Industry
February 22, 2018
National Assessment Governing Board
Ad Hoc Committee on Measures of Postsecondary Preparedness

As part of meeting the charge of the Ad Hoc Committee on Measures of Postsecondary Preparedness, HumRRO organized and facilitated a meeting with industry experts. The purpose of this meeting was to get input from leaders and experts in industry about (a) the jobs that will exist in 2030, (b) the skills that these jobs will require, and (c) the measures/indicators that would be needed to provide a status of elementary and secondary students with respect to these skills.

We were fortunate to assemble an exceptional panel of experts and leaders. The panel members included Ms. Paula Collins, Texas Instruments, Mr. Marcelino Ford-Livene, Intel Corporation, Dr. Scott Heimlich, Amgen Foundation, Dr. Chauncy Lennon, JPMorgan Chase, and Mr. Reginald McGregor, Rolls-Royce Corporation.

The meeting was held on February 22, 2018 in Alexandria, Virginia. An overview of the National Assessment Governing Board and the charge of the Ad Hoc Committee on Measures of Postsecondary Preparedness, along with the agenda and logistical information for the meeting were sent to the panelists in advance.

Thanos Patelis (HumRRO) opened the meeting and after quickly informing the group of some logistics, Terry Mazany provided an overview and led the attendees through introductions. Then, Thanos Patelis facilitated the meeting around the three areas of inquiry involving (a) the jobs of 2030, (b) the skills that they will require, and (c) the measures/indicators that will be important to provide. Finally, Terry Mazany offered some concluding comments. The agenda and the list of all attendees is in Appendix A.

The purpose of this document is to provide information on the themes and comments made by the panelists. The information in this report is meant to provide insight into the rich conversation and comments provided by the expert panelists.

The Future of the Workplace and Work

- The titles of the jobs in 2030 cannot be predicted. However, the jobs of the future will require many skills and will be driven by globalization, artificial intelligence, and "big data".
  - Globalization will change the workplace, from the types of jobs available (i.e., global competition for jobs) to working on cross-cultural teams.
  - Workplace integration will increase (e.g., working across disciplines instead of in silos by discipline).
  - The pace of automation and existence of the internet enable rapid access to information which will affect what employees do on the job and their job descriptions. The use of the internet and automation will only increase.
Employers should embrace new methods of communication, driven by the next generation. For example, hiring managers may not be familiar or may be uncomfortable with the latest communication modes of those applying for jobs. Rather than allowing that to impact negatively on job applicants, employers should acknowledge the differences as innovation or trends to monitor. Job applicants may also need to be attuned to this dynamic.

Technology will be at the forefront. For example, JP Morgan Chase is a “tech company that also loans money”; they do not consider themselves primarily a financial institution.

Complicated tasks can be handled by automation (which will replace some jobs). Employees of the future will need to work with automated equipment and employees will be needed to design and service the automation.

Complex tasks will take human thought (and these types of jobs will remain and additional ones will be added in the future).

There is and likely there will continue to be a duality in the job descriptions of the future: academic skills and college degree required versus high school diploma and training and apprenticeship experience required. Panelists noted they come from the academic skills track and although they acknowledge the diploma-training track, they suggested consulting with experts in that area for a more detailed picture of what the future holds for those not following the 4-year college track.

Need to hire the person with the right skill set, not the person with the most qualifications (who may be overqualified and a poor fit for the work). This is sometimes a tendency when college-graduate hiring managers put more emphasis on college degree, the background they come from and perspective they bring to their job, than is warranted by the demands of the job being filled.

Most jobs that do not require a 4-year college degree, will require additional training, such as a 2-year college degree, technical training, or post-secondary education and/or training leading to certification.

Employer provides job skills (e.g., specific knowledge and procedures), while employee brings workplace competencies to the job (see competencies in the skills needed in the future). More job-related training will be provided by the employer, such as in-house mini-MBA programs provided by large corporations.

Continuous learning will be required to keep up with change. The employer will support or provide the training or education; the employee must participate to keep pace.

Panelists indicated the need for initiatives to empower students, especially those who are “at-risk” and do not have role models, with an understanding of the labor market and expose them to employment options. Suggestions for empowering students so they are ready for post-secondary steps to meet their goals:

Help them define pathways to jobs.

Assist in setting goals; define an individual’s “north star”.

Employer/employee relationships will change.

More contract work will emerge, which allows workers to dictate own schedule and/or workplace.

Office space will be different.
For example, if employees come to the office, they will use a laptop and choose a work space area plugging into the network. The exact location may vary and will be more fluid than today.

**Skills Needed in the Future**

- Panelists described the need for employees to be able to apply skills, which defines competencies. Having a skill is not sufficient. Must know how to apply the skill to real world problems.
- The skills that were highlighted were as follows:
  - Ability to collaborate with people and machines, as the workplace incorporates more technology and automation as well as more collaboration.
  - Ability to interact with technology in jobs at all levels. Career Technical Education (CTE) can provide skills and certification for certain jobs.
  - Data skills are in demand - data is the new oil.
  - Less focus on job-specific content skills and more on workplace competencies:
    - Critical thinking, effective communication, collaboration, adaptability, problem solving, creativity, integrity, community/workplace citizenship, agility, learning disposition, persistence, attitude, interest.
  - Able to handle failure – know what to do when the button fails.
- Need power skills and experience, especially for at-risk students, to navigate the job market and succeed in entry-level positions – resume writing, oral communication, working on teams, basic reading/writing and mathematics ability.

**Measures of Skills in the Future**

- Consider measuring post-secondary readiness skills in grade 8.
- Maintain traditional knowledge measures (i.e., reading, mathematics).
  - Some went as far as to say that these measures of academic skills should not be removed and any other measures should be added.
- Design-build skills can be measured by persistence. Do you persist until object is built?
- Measure application of skills at grade 12. Can students demonstrate their skills (versus showing their knowledge of skills)?
- Add new measures tapping workplace requirements. Be creative in measuring skills (e.g., use certificates or credentials). Leverage CTE curriculum and measures.
  - In the interview process for candidates, hiring managers will give a problem to solve. Therefore, such metrics that demonstrate process and results of solving problems would be helpful.
- Need measures on collaboration, empowerment, and creativity.
- Tie relevancy of measures to industry and align with education. Do this regionally so that measures of preparedness are informative to:
  - students (do they have the skills needed for jobs in their community?),
  - industry (do local job applicants have the skills needed for jobs being offered in their community?),
  - educators (are they preparing students for post-secondary opportunities in their community?), and
  - policy makers (does the local workforce have the skills that industry in their community require?).
• While this may not be the Governing Board’s responsibility, students should be given the ability to develop digital portfolios, including coursework and experiential activities, in school to demonstrate their skills and achievements. This would be helpful to employers.
• The measures must keep evolving as the type of work and required skills change over time.
• One interesting observation was that the panelists described job training interventions for at-risk youth with measures of program success embedded as artifacts of the experience. Did the participant build something? While the final product might not have been their initial design, the focus was on the creative process and the ability to troubleshoot problems as well as to persist in developing the final product.
Appendix A: Meeting Agenda and Attendees

Expert Panel Meeting
National Assessment Governing Board
Ad Hoc Committee on Measures of Postsecondary Preparedness

February 22, 2018 | Agenda

11:00 to 11:05 AM  Start Meeting
Thanos Patelis, Facilitator, HumRRO

11:05 to 11:15 AM  Welcome and Introductions
Terry Mazany, National Assessment Governing Board Member
Chair, Ad Hoc Committee on Measures of Postsecondary Preparedness

11:15 AM to 12:00 PM  Work of the Future
Thanos Patelis, Facilitator, HumRRO

Guiding Questions:
- What do you see as the type of jobs graduating high school seniors will have in 2030?
- Compared to jobs now, what kind of trends do you see emerging for jobs in 2030?
- Do you foresee any differences of jobs by industry or do you expect similar trends to occur for all jobs?
- What do you see as expectations of employers for these students?
- How do you envision the hiring process to be?
- What role will postsecondary institutions play in training and preparing students for these jobs?

12:00 to 12:15 PM  Break to get lunch

12:15 to 1:00 PM  Skills for the Work of the Future
Thanos Patelis, Facilitator, HumRRO

Guiding Questions:
- What types of skills will graduating high school seniors need to have in 2030 in order to get the jobs in 2030?
- What would you consider pre-requisite skills vs. skills that can be acquired on the job?
- What role will postsecondary institutions play in training these skills?
- What would a hiring manager in 2030 look for in prospective hires?

1:00 to 1:45 PM  Measures of these Skills Associated with Work of the Future
Thanos Patelis, Facilitator, HumRRO

Guiding Questions:
- What measures do you see being used to represent these skills?
- What metrics would provide helpful information in the aggregate about the skills of graduating high school seniors?

1:45 to 2:00 PM  Final thoughts and concluding remarks
Terry Mazany, National Assessment Governing Board Member
Chair, Ad Hoc Committee on Measures of Postsecondary Preparedness
Attendees

Expert Panelists:
- Paula Collins, Texas Instruments
- Marcelino Ford-Livene, Intel Corporation
- Scott Heimlich, Amgen Foundation
- Chauncy Lennon, JPMorgan Chase
- Reginald McGregor, Rolls-Royce Corporation

Governing Board Members:
- Terry Mazany, Chair, Ad Hoc Committee on Measures of Postsecondary Preparedness
- Honorable James E. Geringer, Former Governor of Wyoming, Cheyenne, Wyoming
- Carol Jago, Associate Director, California Reading & Literature Project at UCLA, Oak Park, Illinois
- Dale Nowlin, Teacher and Mathematics Department Chair, Bartholomew Consolidated School Corporation, Columbus, Indiana
- Honorable Beverly Perdue, Former Governor of North Carolina, New Bern, North Carolina
- Linda P. Rosen, Chief Executive Officer, Change the Equation, Washington, DC
- Chasidy White, Director of Strategic Initiatives, Office of the Superintendent, Montgomery, Alabama

Governing Board Staff Members:
- Bill Bushaw, Executive Director
- Lisa Stooksberry, Deputy Executive Director
- Lily Clark, Assistant Director for Policy & Research
- Laura LoGerfo, Assistant Director for Reporting & Analysis
- Munira Mwalimu, Executive Officer & Contracting Officer
- Sharyn Rosenberg, Assistant Director for Psychometrics
- Angela Scott, Management & Program Analyst

HumRRO Staff Members:
- Monica Gribben, Senior Staff Scientist
- Deirdre Knapp, Vice President, Assessment and Evaluation in Education and the Workplace
- Jackson Millard, Research Associate
- Thanos Patelis, Principal Scientist
Paula Collins
Vice President, Worldwide Government Relations
Texas Instruments

Paula J. Collins is vice president of Worldwide Government Relations for Texas Instruments where she leads the Company’s advocacy activities in the United States and abroad. She joined Texas Instruments in 1999 as Director of Government Relations and managed the Company’s legislative and public policy activities on a wide range of issues, including immigration, funding for basic research and education.

Ms. Collins came to Texas Instruments with extensive government, corporate and business association experience. After serving as a legislative assistant on Capitol Hill, she joined American Express Company, where for ten years she directed the Company’s legislative activities on a wide range of public policy issues including a number of trade initiatives. In 1993, she joined the Business Roundtable where she worked closely with corporate leaders to develop and implement public policy campaigns on international trade, budget and workforce initiatives. From 1995-1997, she directed international trade relations at Eastman Kodak Company and from 1997-1999 was a principal with The Fratelli Group, a strategic communications firm where she played an active role in the development and implementation of comprehensive public affairs strategies for several coalitions on trade and telecommunications issues.

Ms. Collins is a graduate of Yale University and attended the Program for Management Development at Harvard Business School. She is an active participant in her church and local civic organizations, and is a member of several professional organizations. She is a member of the Board of Directors and Executive Committee of the Information Technology Industry Council, and chairman of the Board of the Task Force on American Innovation.
Marcelino Ford-Livene
General Manager, Global Programs and Alliances
Intel Corporation

Marcelino Ford-Livene is the General Manager of Global Programs and Alliances for Intel's Worldwide Corporate Affairs Group. In this capacity, he leads the organization charged with designing the framework and strategic plan for identifying and prioritizing win-win strategic alliances, relationships and partnerships with various global industry, government and special interest groups that advance the strategic direction of Intel’s Diversity and Inclusion Initiative. Prior to this role, Ford-Livene was the General Manger of New Channels and Advanced Advertising for Intel Media, where he led the organization charged with programming, licensing and distributing new format television channels and advertising-supported video-on-demand programming. He was also responsible for advertising sales, advertising operations, audience research and data analytics for Intel Media’s OTT services. He also co-authored patents on TV viewership analytics and advanced advertising behavioral targeting. Prior to Intel, he was a senior member of TV Guide’s corporate development and planning team. He has also held senior positions with the U.S. Federal Communications Commission in Washington, DC. He served as Special Counsel for New Media Policy for Chairman William E. Kennard and as Senior Counsel and Director of Media Strategic Analysis for the FCC’s Office of Strategic Planning under Chairman Michael Powell. Ford-Livene was the Division Chairman of the Interactive Media Division for the American Bar Association’s Forum on the Entertainment and Sports Industries from 2006 to 2013. He also served for eight years on the board of the TV Academy, the organization that awards the prestigious Primetime Emmy for creative excellence in the television industry. He was also the TV Academy’s Board Secretary and a member of its Executive Committee from 2010 to 2013. He is currently the Co-Chairman of the TV Academy’s Diversity Committee and a founding board member of the Digital Diversity Network. Corporate boards that Ford-Livene has served on include Delivery Agent in San Francisco, CA and TRA Global, which was acquired by TiVo. Ford-Livene earned a B.A. in economics from UC San Diego, a J.D./M.B.A. from the University of Illinois and has completed an Executive Leadership Program at Harvard Business School.
Scott Heimlich
Vice President, Amgen Foundation

Scott M. Heimlich is vice president of the Amgen Foundation. He is responsible for the strategic management and direction of the Foundation’s science education portfolio, including the development and oversight of key initiatives at the K-12 and higher education levels. He was the principal architect and continues to lead the Amgen Scholars Program, the Foundation’s largest initiative providing undergraduates with access to research opportunities at premier educational and research institutions across the world. Under his leadership, the Amgen Biotech Experience transformed from a local program into a multi-site, international initiative bringing biotechnology lab experiences to over 80,000 secondary students a year. With these and many other initiatives, the Foundation’s commitment to science education recently surpassed the $125 million milestone.

Prior to joining Amgen in 2005, he served in positions at the University of California, Los Angeles, Los Angeles Pierce College, University of Southern California, and a junior high school in Japan. He holds a bachelor’s degree, master’s degree, and doctorate in education from the University of California, Los Angeles.

Chauncy Lennon
Managing Director and Head of Workforce Initiatives
Global Philanthropy
JPMorgan Chase & Co.

Chauncy Lennon leads JPMorgan Chase & Co.’s initiatives to promote economic opportunity through investments in workforce practice, innovation, and policy. These include New Skills at Work, a $250 million global initiative to support demand-driven workforce systems that promote prosperity for workers and industries; New Skills for Youth, a $75 million initiative to increase the number of young people who complete career pathways that begin in high school and end with postsecondary degrees or credentials aligned with good-paying, high-demand jobs; The Fellowship Initiative, a program providing young men of color with learning experiences that help them achieve their education and career potential; and a $17 million investment in Summer Youth Employment Programs in US cities to help underserved youth obtain the skills necessary to build lasting careers.

He serves on the New York City Workforce Development Board, the College Promise Campaign Advisory Board, and the Neighborhood Trust Financial Partners Board.
He joined JPMorgan Chase from the Ford Foundation, where his grant-making focused on promoting economic advancement for low-income workers by improving access to workforce development and work support programs. Prior to the Ford Foundation, he was senior vice president for Asset Building at Seedco, a national workforce development intermediary. He also has extensive experience researching the mobility patterns of the working poor. He earned his Ph.D. in anthropology from Columbia University, master's degree from the University of Chicago and bachelor's degree from Williams College. He has taught urban studies at Columbia's School of International and Public Affairs and Barnard College.

Reginald McGregor
Manager, Research & Technology Strategy Group
Rolls-Royce Corporation

Reginald McGregor, Manager of Engineering Employee Development and STEM Outreach at Rolls-Royce Corporation. He is a Mechanical Engineer with over 15 years’ experience in various engineering roles. He spent over 8 years in early career development managing the engineering co-op; high school internship and graduate development programs. Reginald holds BS in Mechanical Engineering, MBA and currently completing a MS in Technology Leadership and Innovation. He is very active in workforce development and STEM education and serving the community. Reginald enjoys reading, outdoor activities and spending time with family.

Reginald serves on several boards and committees including the Governor-appointed Region 5 Works Council, President of the Lawrence Township School Board, Indiana STEM Advisory Council, STEMx National Advisory Board, Purdue Engineering Education Industrial Advisory Council, Marion County Superintendents STEM Coalition, Indiana Chamber of Commerce K-12 and Workforce Committees, Million Women Mentor Steering Committee, Indiana Afterschool Network Board, and EmployIndy Youth Committee.
AGENDA

5:15 – 5:20 pm  Welcome and Agenda Overview  
   *Tonya Matthews, Vice Chair*

5:20 – 5:35 pm  Executive Director’s Report  
   *Bill Bushaw, Executive Director*

5:35 – 5:40 pm  Nomination Process for Board Vice Chair for the Term  
   October 1, 2018 – September 30, 2019  
   *Lisa Stooksberry, Deputy Executive Director*

5:40 – 6:00 pm  Executive Director Search  
   *Terry Mazany, Search Committee Chair*

*Information Item: Strategic Vision Activities Progress Report*  
*Attachment*
## National Assessment Governing Board
### Strategic Vision Implementation Activities Report*

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Start</th>
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<tr>
<td><strong>Strategic Vision</strong></td>
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<td>SV1 Develop and Sustain Partnerships</td>
<td>August 4, 2016</td>
<td>March 31, 2025</td>
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<td>Work with Partners to Increase Awareness and Use of NAEP</td>
<td>August 4, 2016</td>
<td>December 31, 2020</td>
<td>R&amp;D</td>
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<td>Maintain Database of Points of Contact</td>
<td>October 12, 2017</td>
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<td>Disseminate Content with/through Partners</td>
<td>October 1, 2016</td>
<td>December 31, 2020</td>
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<td>TUDA Task Force</td>
<td>January 3, 2018</td>
<td>November 18, 2020</td>
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<td>State Policy Task Force</td>
<td>August 8, 2016</td>
<td>August 31, 2020</td>
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<td><strong>SV2 Linking Data</strong></td>
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<td>Incorporate Ongoing Linking Studies and Consider Additional Work</td>
<td>November 18, 2016</td>
<td>December 31, 2020</td>
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<td>Expand NAEP Linkages to Administrative Data</td>
<td>September 8, 2017</td>
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<td>Board Considers What Federal Data Presented with NAEP</td>
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<td>Board Promotes Work Accomplished through NCES Secondary Research Grants</td>
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<td>December 27, 2019</td>
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<td>Learn from Reporting of International Assessments</td>
<td>November 17, 2017</td>
<td>November 18, 2017</td>
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<td><strong>SV3 Expand NAEP Resources</strong></td>
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<td>Create Tools for New Audiences (also SV4)</td>
<td>April 3, 2018</td>
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<td>Develop 'Menu of Engagement'</td>
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<td>Create 'Brief Case' Studies on NAEP Use (also SV4)</td>
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<td>Build Teacher Prep Toolkit</td>
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<td>Share Effective Uses of NAEP</td>
<td>March 1, 2018</td>
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<td>Research Uses of NAEP by Various Audiences</td>
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<td>Improve Understanding of NAEP Achievement Levels</td>
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<td>Develop Statement of Intended and Appropriate Uses of NAEP</td>
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<td>Host Stakeholder Panels at Board Meetings</td>
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<td>Disseminate Information on NAEP Technical Procedures to Share Expertise</td>
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<td><strong>SV4 Dissemination and Use of NAEP</strong></td>
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<td>Post-release Stakeholder Events to Extend Life of Results</td>
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<td>Update Governing Board Website</td>
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<td>Expand Capability for More Wide-ranging Communications Approaches and Products</td>
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<td>Identify Advanced and More User-friendly Approaches to Presenting NAEP Results</td>
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<td>August 2, 2018</td>
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<td>ADC</td>
</tr>
<tr>
<td>Explore New Approaches to Framework Update Processes (also SV8)</td>
<td>November 17, 2017</td>
<td>August 4, 2023</td>
<td>ADC</td>
</tr>
<tr>
<td>Review &amp; Update Reading Framework for 2025 Assessment</td>
<td>October 9, 2017</td>
<td>March 31, 2025</td>
<td>ADC</td>
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<tr>
<td>Review &amp; Update Civics, Geography, and U.S. History Frameworks (Depends on Assessment Schedule Decisions)</td>
<td>March 1, 2018</td>
<td>March 17, 2020</td>
<td>ADC</td>
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<tr>
<td>Review &amp; Update Economics Framework (Depends on Assessment Schedule Decisions)</td>
<td>March 6, 2020</td>
<td>August 6, 2021</td>
<td>ADC</td>
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<tr>
<td>Review &amp; Update Science and TEL Frameworks (Depends on Assessment Schedule Decisions)</td>
<td>September 1, 2020</td>
<td>November 18, 2022</td>
<td>ADC</td>
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<tr>
<td>Review &amp; Update Writing Framework (Depends on Assessment Schedule Decisions)</td>
<td>March 7, 2022</td>
<td>August 4, 2023</td>
<td>ADC</td>
</tr>
</tbody>
</table>

* Working Draft: Dates reflect tentative plans.
### National Assessment Governing Board

#### Strategic Vision Implementation Activities Report*

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Start</th>
<th>Finish</th>
<th>Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update Board Policy on Achievement Levels (Including New Approaches to ALDs)</td>
<td>January 2, 2017</td>
<td>November 17, 2018</td>
<td>COSDAM</td>
</tr>
<tr>
<td>SV6 Contextual Variables</td>
<td>November 18, 2016</td>
<td>December 31, 2020</td>
<td>COSDAM</td>
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<tr>
<td>R&amp;D Reviews and Gives Feedback on New Reporting of Contextual Data</td>
<td>February 1, 2018</td>
<td>October 10, 2019</td>
<td>R&amp;D</td>
</tr>
<tr>
<td>R&amp;D Monitors How New Core Contextual Indices Reported</td>
<td>February 1, 2018</td>
<td>October 10, 2019</td>
<td>R&amp;D</td>
</tr>
<tr>
<td>R&amp;D Receives Updates on Revised Household Composition Variables</td>
<td>April 5, 2018</td>
<td>December 31, 2020</td>
<td>NCES</td>
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<tr>
<td>R&amp;D Reviews 2021 Core Contextual Data</td>
<td>August 4, 2017</td>
<td>December 30, 2019</td>
<td>R&amp;D</td>
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<tr>
<td>Periodic ADC-R&amp;D Meetings on Core and Subject-Specific Variables (also SV6)</td>
<td>November 17, 2017</td>
<td>December 31, 2020</td>
<td>ADC, R&amp;D</td>
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<tr>
<td>ADC Identifies NAEP Resources for Educators (also SV3)</td>
<td>May 18, 2017</td>
<td>March 18, 2021</td>
<td>ADC, R&amp;D</td>
</tr>
<tr>
<td>SV7 Long-Term Trend</td>
<td>August 8, 2016</td>
<td>May 18, 2018</td>
<td>COSDAM</td>
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<td>Ed Haertel Overview Paper</td>
<td>August 8, 2016</td>
<td>December 9, 2016</td>
<td>COSDAM</td>
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<tr>
<td>Reaction Papers (4)</td>
<td>December 12, 2016</td>
<td>February 17, 2017</td>
<td>COSDAM</td>
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<td>Washington DC Symposium</td>
<td>March 2, 2017</td>
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<td>AERA Symposium</td>
<td>April 29, 2017</td>
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<td>Full Board</td>
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<tr>
<td>Governing Board Discussions</td>
<td>March 3, 2017</td>
<td>May 18, 2018</td>
<td>Full Board</td>
</tr>
<tr>
<td>Tasks Assigned to Committees</td>
<td>March 1, 2018</td>
<td>March 1, 2018</td>
<td>Executive Committee</td>
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<tr>
<td>International Assessment Expert Panel</td>
<td>November 17, 2017</td>
<td>November 17, 2017</td>
<td>Full Board</td>
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<tr>
<td>SV8 Other Countries</td>
<td>November 17, 2017</td>
<td>November 17, 2017</td>
<td>Full Board</td>
</tr>
<tr>
<td>SV9 Assessment Schedule</td>
<td>May 19, 2017</td>
<td>March 1, 2019</td>
<td>Executive Committee</td>
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<tr>
<td>Develop Policy Priorities</td>
<td>May 19, 2017</td>
<td>March 2, 2018</td>
<td>Executive Committee</td>
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<tr>
<td>Considerations of Consolidated Frameworks and Coordinated Administrations</td>
<td>November 17, 2017</td>
<td>November 17, 2018</td>
<td>Full Board</td>
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<tr>
<td>Revise NAEP Assessment Schedule</td>
<td>August 6, 2018</td>
<td>March 1, 2019</td>
<td>Full Board</td>
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<tr>
<td>SV10 Postsecondary Preparedness</td>
<td>August 6, 2016</td>
<td>August 31, 2020</td>
<td>Ad Hoc Committee</td>
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<tr>
<td>Ad Hoc Committee Develops Recommendations</td>
<td>August 3, 2017</td>
<td>November 17, 2018</td>
<td>Ad Hoc Committee</td>
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<tr>
<td>Ad Hoc Committee created</td>
<td>August 3, 2017</td>
<td>August 3, 2017</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Ad Hoc Committee meets to discuss approach &amp; discuss Q1: ready for what?</td>
<td>November 16, 2017</td>
<td>November 16, 2017</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Expert Panel - Industry Innovators</td>
<td>February 22, 2018</td>
<td>February 22, 2018</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Ad Hoc Committee meets to discuss Q2</td>
<td>March 1, 2018</td>
<td>March 1, 2018</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Expert Panel - Higher Ed Innovators</td>
<td>April 19, 2018</td>
<td>April 19, 2018</td>
<td>Ad Hoc Committee</td>
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<tr>
<td>Ad Hoc Committee meets to discuss Q3</td>
<td>May 17, 2018</td>
<td>May 17, 2018</td>
<td>Ad Hoc Committee</td>
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<tr>
<td>Expert Panel - Futurists</td>
<td>June 21, 2018</td>
<td>June 21, 2018</td>
<td>Ad Hoc Committee</td>
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<tr>
<td>Stakeholder input: State Assessment Experts @NCSA</td>
<td>June 28, 2018</td>
<td>June 28, 2018</td>
<td>Ad Hoc Committee</td>
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<tr>
<td>Ad Hoc Committee meets &amp; discusses draft recommendations</td>
<td>August 2, 2018</td>
<td>August 2, 2018</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Expert Panel - Students</td>
<td>September 27, 2018</td>
<td>September 27, 2018</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Ad Hoc Committee - ACTION on Recommendations Report</td>
<td>November 15, 2018</td>
<td>November 15, 2018</td>
<td>Ad Hoc Committee</td>
</tr>
<tr>
<td>Ad Hoc Committee presents Recommendations to the Board</td>
<td>November 16, 2018</td>
<td>November 16, 2018</td>
<td>Full Board</td>
</tr>
<tr>
<td>Board Action on Ad Hoc Committee Recommendations</td>
<td>November 17, 2018</td>
<td>November 17, 2018</td>
<td>Full Board</td>
</tr>
<tr>
<td>Implement Approved Recommendations of Ad Hoc Committee</td>
<td>November 19, 2018</td>
<td>August 31, 2020</td>
<td>Full Board</td>
</tr>
<tr>
<td>Continue Research to Gather Validity Evidence on Academic Preparedness for College</td>
<td>August 6, 2016</td>
<td>August 31, 2020</td>
<td>COSDAM</td>
</tr>
</tbody>
</table>

* Working Draft: Dates reflect tentative plans.
Welcome to Alabama

Two esteemed local leaders from Alabama will provide welcoming remarks to the National Assessment Governing Board. Alabama Secretary of State John Merrill and Montgomery Mayor Todd Strange will discuss their roles and relevant work, and answer questions from Board members. Biographies are below.

**John Merrill** is Alabama Secretary of State. Merrill has had an extensive career in public service. He represented District 62 in the Alabama House of Representatives from 2010-14. Previously he was director of community relations and community education for the Tuscaloosa County Board of Education, assistant director of the Tuscaloosa County Industrial Development Authority, director of business development for the Chamber of Commerce of West Alabama, and business development officer for First Federal Bank in Tuscaloosa.

**Todd Strange** is Mayor of the City of Montgomery. Prior to being elected in 2009, Strange served as chairman of the Montgomery County Commission for five years. He is the former president, CEO, and co-owner of Blount Strange Automotive Group. Strange was the director of the Alabama Development of Commerce and is former senior vice president of administration at Blount International, Ltd. and former president and CEO of Blount Development Corporation.
First Class Pre-K: Preparing Alabama's Children for School Success and Lifelong Learning

For 12 consecutive years, Alabama’s voluntary First Class Pre-K program has been recognized for providing the highest quality state-funded pre-kindergarten program in America. In its 2017 State of Preschool Yearbook—an annual report on the quality of state-funded early childhood education programs across the country—the National Institute for Early Education Research (NIEER) released those findings.

The program, overseen by the Alabama Department of Early Childhood Education, currently serves nearly 17,000 students, or 29 percent of all eligible four-year-olds, in 941 classrooms.

Alabama is one of only three states to meet or exceed all ten program review benchmarks, which include items such as class size, teacher training, and student-to-teacher ratio. Alabama was also recognized in the report as having the capacity to maintain quality while expanding.

The support of policymakers has been instrumental in the program’s success. In 2005, the program began with $4.3 million in funding and has tripled the percentage of eligible four-year-olds served since that time.

In addition to NIEER’s findings, a recent study of Alabama third graders found that students who participated in the state’s First Class Pre-K program are more likely to be proficient in reading and math than their peers. The study was conducted by a team of researchers from the Public Affairs Research Council of Alabama in conjunction with the University of Alabama at Birmingham.

Researchers found that First Class Pre-K:

- Narrowed the gap in reading proficiency by 28 percent for all children in poverty; 32 percent for white children in poverty; 31 percent for Hispanic children in poverty; and, 26 percent for black children in poverty.
- Narrowed the gap in math proficiency by 57 percent for all children in poverty; 71 percent for Hispanic children in poverty; and, 37 percent for black children in poverty.
- Increased reading proficiency for children in poverty by 12 percent overall; 25 percent for Hispanic children in poverty; 23 percent for black children in poverty; and, 3 percent for white children in poverty.
- Increased math proficiency for children in poverty by 13 percent overall; 17 percent for Hispanic children in poverty; 16 percent for black children in poverty; and, 10 percent for white children in poverty.
A panel of educators and policymakers will Alabama’s pre-K efforts in-depth. Biographies for panelists are below.

Panelists:

**Jeana Ross** is Alabama Secretary of Early Childhood Education. Appointed in 2012, Ross oversees initiatives such as the Children’s Policy Councils and Head Start Collaboration Office. Ross began her career in education as a school teacher, later working in several local school systems as a Title 1 specialist, grant writer, and federal programs coordinator. For three decades, Ross has worked to develop, organize, facilitate, and evaluate programs and initiatives that ensure quality educational services for children and support at-risk students and families.

**Del Marsh** is President Pro Tempore of the Alabama State Senate. Now in his fifth term, Marsh has served as a state senator since 1998. Marsh serves on the Agriculture, Conservation and Forestry; County and Municipal Government; and Education and Youth Affairs committees, among others. Marsh is also the owner of Aerospace Coatings International since 1991 and is the director of Southern States Bank.

**Tracye Strichik** is Director of School Readiness in the Alabama Department of Early Childhood Education. She took over that post just over a year ago. Prior to that, she spent nearly seven years as the director of the Office of Early Learning and Family Support. Strichik also served as the director of the Early Childhood Center at Auburn University. She began her career as a kindergarten teacher in Prattville, Alabama.
# National Assessment Governing Board

**Assessment Development Committee**

**May 18, 2017**

**AGENDA**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Information</th>
</tr>
</thead>
</table>
| 10:30 – 11:20 am  | Welcome and Introductions  
*Shannon Garrison, Chair*  
Review of Mathematics Curricular Standards *(SV #5)*  
*Will (Tad) Johnston, AIR*  
*Beth Ratway, AIR*  | Attachment A |
| 11:20 am – 12:45 pm | Panel Discussion:  
NAEP Assessment of Mathematics *(SV #5)*  
*Zalman Usiskin, Director, University of Chicago School Mathematics Project*  
*Kevin Dykema, Teacher, Mattawan (MI) Middle School*  
*Gladis Kersaint, Dean & Professor, University of Connecticut*  
*William McCallum, Professor, University of Arizona*  
*Diana Suddreth, Director of Teaching and Learning, Utah State Board of Education*  
*Moderator: Dale Nowlin, ADC Member*  | Attachment B |
| 12:45 – 1:00 pm   | Debrief: Next Steps for ADC Framework Activities  
*Shannon Garrison*  | Attachment C |
|                   | Information Items  
Item Review Schedule  | Attachment D |
REVIEW OF STATE CURRICULAR STANDARDS IN MATHEMATICS

OVERVIEW
In August 2017, the Governing Board awarded a contract to the American Institutes for Research (AIR) to conduct a Review of State Curricular Standards in Mathematics. The goal of the project was to develop a descriptive and detailed picture of how mathematics curricular content across states relates to what NAEP assesses in mathematics. This was accomplished by collecting the mathematics content standards for grades K through 8 across states, the District of Columbia, and the Department of Defense Education Activity (DoDEA), and comparing them to the assessment objectives in the 2017 NAEP Mathematics Framework for grades 4 and 8. At the May 2018 Governing Board meeting, the AIR project team will provide a results briefing for the Assessment Development Committee (ADC) and the full Board.

PROJECT TEAM
The project leaders include Project Director Maria Stephens, responsible for providing day-to-day leadership, and Task Leaders Tad Johnston and Beth Ratway, responsible for organizing and conducting the comparisons. Maria Stephens has over 15 years of experience in leading content comparison studies and reports, with a focus on NAEP and international assessments. Mr. Johnston has over 20 years of experience as a mathematics educator across all levels of education and has served as a content expert on numerous studies related to national and state mathematics standards. Ms. Ratway’s experience focuses on standards analysis, development, and implementation, including comparative reviews of mathematics standards and financial literacy standards in several states. In addition to three project leaders, the project team includes additional mathematics specialists, senior-level quality assurance reviewers, and research assistants.

PROJECT APPROACH
The work to compare state mathematics standards with NAEP was conducted using a combination of external experts and mathematics specialists within AIR. The Common Core State Standards in Mathematics (CCSS-M) were used as a proxy for the standards of the states that adopted the CCSS-M without changes, reducing the workload from what would otherwise be 52 individual comparisons. For the remaining states, AIR used either their comprehensive list of standards (for non-adopters of CCSS-M) or a partial list of standards encompassing those distinct from CCSS-M (for partial adopters of CCSS-M, i.e., states that adopted CCSS-M but changed or supplemented the standards).

The project approach involved AIR specialists conducting extensive preparatory work to identify preliminary groupings of NAEP objectives and state standards with overlapping content, which

1 Generally speaking, state standards for Grades K–4 were reviewed for possible groupings with NAEP grade 4, and state standards for Grades 5–8 were reviewed for possible groupings with NAEP grade 8—though the AIR
were then reviewed and rated for content alignment by a Content Review Committee (CRC) consisting of 15 external experts. The key research question for the CRC’s task was: **What is the degree of content alignment between grouped NAEP objectives and state standard(s)?** Put another way, the CRC addressed the question: Based on the state standards that were grouped with the NAEP objective, would students have had the opportunity to learn what is being assessed?

For each preliminary grouping of a NAEP objective with one or more state standards, the CRC rated the grouping as:

- **Extended**, to indicate the grouped state standard(s) aligns with all of the NAEP objective and also includes content that extends beyond the NAEP objective and is not found elsewhere in the NAEP grade. That is, students would have had the opportunity to learn all of what NAEP is assessing as well as extra content not found elsewhere in NAEP.

- **Complete**, to indicate the grouped state standard(s) aligns with the entire NAEP objective. That is, students would have had the opportunity to learn all of what NAEP is assessing.

- **Partial**, to indicate the grouped state standard(s) aligns with part of the NAEP objective. That is, students would have had the opportunity to learn part of what NAEP is assessing but something is missing from the state standard that is covered in NAEP (and there may also be extra content in the state standard).

- **Not aligned**, to indicate no state standard aligns with any part of the NAEP objective. That is, students would not have had the opportunity to learn what NAEP is assessing.

In addition to the ratings, the process captured **Missing Content**, content covered in NAEP objectives but not covered in the grouped state standard(s), and **Extra Content**, content that state standards included but were not included in NAEP objectives. Missing and Extra Content were identified through comments collected alongside the ratings and the state standards that could not be grouped with any NAEP objective (i.e., were unique).

A sampling plan assigned CRC members to subsets of states (three reviewers each to five subsets) to manage the volume of states. The CRC received training by webinar and provided ratings independently. They then met in person to come to consensus on aggregate ratings for each preliminary grouping of state standards, discuss alternative groupings, and come to consensus on state standards identified as unique. From these discussions, AIR specialists summarized the Extra Content in state standards and the NAEP content missing from state standards. The specialists then searched for the Missing Content in states’ standards in mandated subjects outside of mathematics.

Altogether, the comparison activities resulted in a detailed picture of content overlap relative to three types of standards documents: NAEP mathematics objectives, state mathematics specialists documented whether any of the state standards at grades K–4 that were deemed unique from NAEP grade 4 have content overlap with NAEP grade 8 (and vice versa). Comparisons focus on the conceptual match in mathematics content between the NAEP objectives and state standards, excluding consideration of the level of cognitive complexity represented in the content.
standards, and state standards in mandated subject areas outside of mathematics, as noted in the following figure.

### Comparing NAEP Mathematics Objectives and State Standards

- **State standards in other subjects**
- **NAEP mathematics objectives**
- **State mathematics standards**

- **Coverage of NAEP**
  - Missing NAEP content that was in other subjects
  - NAEP objectives not aligned and other content that was missing in state standards
  - Overlap (when objectives and standards could be grouped and rated partial, complete, or extended)

**Recent Activity: CRC Consensus Meeting, Analysis, and TAC Meeting**

The CRC Consensus Meeting was held on February 6-8, 2018 in Washington, DC, with all 15 CRC members. The meeting was conducted primarily in subgroups facilitated by AIR specialists. To prepare for the meeting, the AIR project team compiled individual ratings in a consensus document for each state reflecting preliminary aggregate ratings (thresholds below). Discussions at the meeting focused on coming to consensus on final aggregate ratings for the groupings classified as “not determined” in the consensus documents.

<table>
<thead>
<tr>
<th>Preliminary Aggregate Rating</th>
<th>Threshold for Assigning Preliminary Aggregate Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended</td>
<td>if all reviewers rated the grouping as extended</td>
</tr>
<tr>
<td>Complete</td>
<td>if at least two-thirds of reviewers rated the grouping as complete and the remainder as partial</td>
</tr>
<tr>
<td>Partial</td>
<td>if at least two-thirds of reviewers rated the grouping as partial and the remainder as complete</td>
</tr>
<tr>
<td>Not aligned</td>
<td>if all reviewers agreed that the NAEP objective could not be grouped with any state standard</td>
</tr>
<tr>
<td>Unique</td>
<td>if all reviewers agreed that the state standard could not be grouped with any NAEP objective</td>
</tr>
<tr>
<td>Not determined</td>
<td>for any other combination of ratings</td>
</tr>
</tbody>
</table>

*Day 1* focused on the comparisons of NAEP with [CCSS-M](#). Based on observed discrepancies in individual ratings, a select group of NAEP objectives that required clarification were reviewed in
plenary with all 15 reviewers. Subsequently, three groups of five reviewers each discussed the remaining “not determined” objectives by content area.

**Day 2** focused on the comparisons of NAEP with the subset of 9 states that were treated as *non-adopters* of CCSS-M. For these discussions, the CRC was split into five groups of three raters each.

**Day 3** focused on comparisons of NAEP with the subset of 23 states that were treated as *partial adopters* of CCSS-M, using the three groups of five reviewers each from Day 1. Addressing these states on Day 3 allowed Day 1’s CCSS-M decisions to be compiled and reflected in the consensus documents for the partial adopters, thereby ensuring consistency in ratings for objectives and groupings that were similar in CCSS-M and the partial adopter states. Highlighting within these updated consensus documents noted objectives with wording differences relative to the relevant CCSS-M standard(s), and these state-specific differences were the focus of discussion. CRC members were asked: “Do the differences present in the grouped state standards warrant a change in the rating the CRC had earlier assigned to the analogous NAEP/CCSS-M grouping?” If the answer was no, then the CCSS-M rating was assigned as the final aggregate rating. If the answer was yes, then the subgroup discussed which alternative rating was appropriate as the final aggregate rating.

Across all states and groups, *discussions aimed for consensus but allowed a final aggregate rating with two-thirds in agreement*, when necessary. Following the CRC Consensus Meeting, the mathematics comparisons data were cleaned and compiled for preliminary analysis around the three areas of interest:

- a state-by-state picture of the coverage of NAEP objectives by state mathematics standards
- NAEP content that is not covered in state mathematics standards (Missing Content) and the extent to which it may be covered in the curricula of states’ other mandated subjects
- a set of consolidated state mathematics content standards that are not reflected in the NAEP framework and the extent to which these are covered across states (Extra Content)

Analyses included both quantitative analyses (such as identifying modal ratings for each objective, counting objective-level coverage ratings across states, counting modal ratings across objectives, weighting state counts by student population) and qualitative analyses (such as identifying Missing and Extra Content through examination of reviewers’ comments).

The project’s five-member **Technical Advisory Committee (TAC)** was convened on March 21, 2018 to review preliminary results and provided guidance on further analysis and reporting, which was then incorporated into analyses. Work following the TAC meeting has also included completing analyses that were still underway, including searching other subjects’ standards for Missing Content and completing reliability analyses.
**NEXT STEPS**

The next step of the project is to finalize the project reports, including a content coverage narrative and a methodological narrative. The content coverage narrative overlaps greatly with the presentation of key findings at the May 2018 Governing Board meeting.

**MILESTONES**

The major milestones of the project are summarized below.

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Estimated Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain and verify mathematics standards</td>
<td>8/25/17 – 11/1/17</td>
</tr>
<tr>
<td>Convene TAC for guidance on draft analysis and reporting plan</td>
<td>10/5/17</td>
</tr>
<tr>
<td>Draft and finalize analysis and reporting plan</td>
<td>8/25/17 – 10/31/17</td>
</tr>
<tr>
<td>Prepare initial comparison documents</td>
<td>10/13/17 – 12/31/17</td>
</tr>
<tr>
<td>Train the CRC</td>
<td>12/6/17</td>
</tr>
<tr>
<td>Independent rating/review by CRC</td>
<td>12/7/17 – 1/15/18</td>
</tr>
<tr>
<td>Aggregate and compile ratings</td>
<td>1/8/18 – 1/31/18</td>
</tr>
<tr>
<td>In-person consensus meeting</td>
<td>2/6/18 – 2/8/18</td>
</tr>
<tr>
<td>Consolidate state standards and identify “missing” content</td>
<td>2/9/18 – 3/5/18</td>
</tr>
<tr>
<td>Obtain other subjects’ standards and search for “missing” content</td>
<td>1/20/18 – 4/15/18</td>
</tr>
<tr>
<td>Analyze data for preliminary results</td>
<td>2/9/18 – 3/5/18</td>
</tr>
<tr>
<td>Convene TAC for analysis and reporting based on preliminary results</td>
<td>3/21/18</td>
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<tr>
<td>Complete data analyses</td>
<td>3/22/18 – 4/15/18</td>
</tr>
<tr>
<td>Prepare report of findings</td>
<td>3/22/18 – 5/30/18</td>
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<tr>
<td>Present findings at quarterly Board meeting</td>
<td>5/18/18</td>
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NAEP ASSESSMENT OF MATHEMATICS

The Assessment Development Committee (ADC) welcomes distinguished mathematics experts for a discussion about the NAEP Mathematics Framework. Their expertise represents teachers, scholars, and state curriculum directors as leading voices. Each expert will summarize whether NAEP assessment of mathematics as outlined in the NAEP Mathematics Framework should be changed, before inviting questions from the Committee. Board member and resident mathematics expert Dale Nowlin will moderate. Panelists’ bios are below, followed by milestones for the framework. Papers from each expert are attached, summarizing their perspectives.

Dale Nowlin
Moderator & ADC Member
Teacher & Mathematics Department Chair, Bartholomew Consolidated School Corporation

Zalman Usiskin
Professor Emeritus
University of Chicago
Director, University of Chicago School Mathematics Project

Kevin Dykema via video
Teacher
Mattawan (MI) Middle School

Gladis Kersaint via video
Dean & Professor
University of Connecticut

William McCallum via video
Professor
University of Arizona

Diana Suddreth via video
Director of Teaching and Learning
Utah State Board of Education
Zalman Usiskin is a Professor emeritus of education at the University of Chicago. He continues at the university as director of the University of Chicago School Mathematics Project (UCSMP), a position he has held since 1987. His research has focused on the teaching and learning of arithmetic, algebra, and geometry, with particular attention to applications of mathematics at all levels and the use of transformations and related concepts in geometry, algebra, and statistics. His interests are broader, covering all aspects of mathematics education, with particular emphasis on matters related to curriculum, instruction, and testing; the selection and organization of content; comparison studies of students using different curricula; international mathematics education; the history of mathematics education; and educational policy.

Zalman has authored or co-authored over 150 articles and papers on mathematics and mathematics education, and dozens of books, including textbooks for grades 6 through 12. In developing these books, he taught mathematics in nine secondary schools. He also co-authored a mathematics text for graduate students on high school mathematics. From 2004 to 2015, he was a co-PI of the Center for the Study of Mathematics Curriculum. In 2014, the National Council of Teachers of Mathematics (NCTM) published a book of 38 of his papers.

Zalman’s service includes terms on the Mathematical Sciences Education Board of the National Research Council, the Board of Directors of NCTM, and the United States National Commission on Mathematics Instruction, which he chaired from 1998 to 2001. From 1995 through 2005, he was on various NAEP committees associated with development and evaluation of NAEP items, including development of the NAEP Mathematics Framework.

Zalman has received a national leadership award from the National Council of Supervisors of Mathematics and lifetime achievement awards from NCTM and the International Society for the Design and Development of Education. He holds bachelor’s degrees in mathematics and education from the University of Illinois, an M.A. in teaching from Harvard University, and a Ph.D. from the University of Michigan in curriculum and instruction.

Kevin Dykema is an energetic teacher and presenter who has a passion for mathematics. He has taught 8th grade math for the past 22 years and is currently teaching at Mattawan (MI) Middle School. He also conducts many professional development sessions throughout the United States on the use of manipulatives in the math classroom. Kevin believes that manipulatives are a great way for students to develop conceptual understanding of the math. He has written several how-to books on teaching mathematics using manipulatives, and has served as editor and referee for the journal Mathematics Teaching in the Middle School.

Kevin was awarded the Michigan Council of Teachers of Mathematics Regional Director’s Award in 2007 for outstanding contribution and leadership in mathematics education as
well as the Service Award in 2014. He has served as a regional director for the organization and was the annual conference chair from 2011-2016. He also co-founded a conference focused on mathematics for students with disabilities, which he has co-chaired since 2015. Kevin is honored to serve a 3-year term on the National Council of Teachers of Mathematics Board of Directors, which began in 2016.

Kevin has a B.A in Mathematics from Calvin College and a M.A. in Mathematics Education from Western Michigan University.

**Gladis Kersaint** is Dean and Professor of Mathematics Education at the University of Connecticut, Neag School of Education. Gladis previously served as the associate dean of academic affairs and research and professor of mathematics education for the College of Education at the University of South Florida (USF). There, she served as director of the David C. Anchin Center and held the David C. Anchin Endowed Chair in Education Innovation. She also served as coordinator of USF Undergraduate Education and chair of the General Education Council. Prior to her academic post at USF, Gladis taught high school mathematics for the Miami Dade County Public Schools.

Gladis has an extensive publication and national and local service record. She has published four books and numerous refereed journal articles related to factors that influence mathematics teacher education and effective mathematics teaching, the mathematical teaching and learning of at-risk students, and the use of technology in teaching and learning mathematics. During her tenure at USF, she served as the principal or co-principal investigator of approximately $30 million of National Science Foundation, U.S. Department of Education, and Florida Department of Education grants.

Gladis has led a number of collaborative STEM education projects involving school district personnel along with university faculty in Arts and Sciences and Engineering. Her national service includes being a member of the Board of Directors for the National Council of Teachers of Mathematics and the Association of Mathematics Teacher Educators. Gladis holds a B.S. in Mathematics and an M.S. in Education from the University of Miami, as well as a Ph.D. in Mathematics Education from Illinois State University.

**William McCallum** is a University Distinguished Professor of Mathematics at the University of Arizona. Born in Sydney, Australia in 1956, he received his Ph.D. in Mathematics from Harvard University in 1984, under the supervision of Barry Mazur. After spending two years at the University of California, Berkeley, and one at the Mathematical Sciences Research Institute in Berkeley, he joined the faculty at the University of Arizona in 1987. In 1989 he joined the Harvard calculus consortium, and is the lead author of the consortium’s multivariable calculus and college algebra texts. In 1993–94 he spent a year at the Institut des Hautes Etudes Scientifiques, and in 1995–96 he spent a year at the Institute for Advanced Study on a Centennial Fellowship from the American Mathematical Society. In 2005 he received the Director’s Award for Distinguished Teaching Scholars from the National Science Foundation. In 2006 he founded the Institute for Mathematics and Education at the University of Arizona, and is currently
its director. In 2009–2010 he was one of the lead writers for the Common Core State Standards in Mathematics. His professional interests include arithmetical algebraic geometry and mathematics education. He has received grants and written articles, essays, and books in both areas.

**Diana Suddreth** is the Director of Teaching and Learning at the Utah State Board of Education where she currently leads the Utah Teacher Effectiveness Team, The Standards Implementation Teams, the Digital Teaching and Learning Team, and Utah Educator Licensing. Although her professional role has grown to encompass all academic content areas, her passion remains for high quality mathematics education for all students.

Diana began her 25-year teaching career in Las Vegas, Nevada, and ended it in Southern Utah with stops in California and Northern Utah along the way. Diana was the 2000 Presidential Awardee in Secondary Mathematics for Utah and earned her National Board Teaching Certificate in Adolescent and Young Adult Mathematics in 2002. While teaching, Diana was the recipient of several grants, including the Toyota TIME grant which she focused on building a statistics library and resources for her high school.

Diana joined the Utah State Board of Education in 2006 as Secondary Mathematic Specialist and was also the STEM Coordinator for five years before becoming director. She led the state in transition to an integrated pathway of the Utah State Core based on the Common Core. Her activities in the mathematics education community include serving two years as the President of the Association of State Supervisors for Mathematics and working with the Mathematics Teacher Education Partnership.
**NAEP Mathematics Framework Milestones: Past & Future**

- **2000.** Panels were convened to update the NAEP Mathematics Framework. Outreach before the project launch suggested that needed revisions did not require an entirely new framework to replace the previous framework. Therefore, no disruption to NAEP trend reporting was anticipated.

- **2001.** Board adopted the current NAEP Mathematics Framework.

- **2006.** Board adopted modifications for the 12th grade to pave the way for NAEP reporting on academic preparedness for college and job training. 2005 results were reported with continued student achievement trends for grades 4 and 8 extending back to 1990. A new trend line for grade 12 began, extending from 2005 onward.

- **August 2017.** ADC completed Framework Development Policy revision, and commissions comparison study to review mathematics standards across the country.

- **November 2017.** ADC discussed strategies for upcoming framework update projects.

- **May 18, 2018.** ADC is briefed on the mathematics standards review results addressing all 50 states and invites mathematics experts to share comments and recommendations on the NAEP Mathematics Framework. These will be used to assist the Committee in preparing a content recommendation to the Board regarding the framework.

- **June – July 2018.** ADC deliberates next steps for the NAEP Mathematics Framework and develops a recommendation to the full Board regarding the scope of the framework update that shall be conducted.

- **August 2018.** The Board takes action on the Charge to the Visioning and Framework Development Panels that will be convened. The NAEP Mathematics Framework Update project launches with a Fall 2018 Visioning Panel Meeting.
External Reviews of

The Mathematics Framework for the 2017 National Assessment of Educational Progress

Prepared by:
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Gladis Kersaint
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April 2018
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Extrinsic Reviews of

The Mathematics Framework for the 2017 National Assessment of Educational Progress

The National Assessment Governing Board recruited five experts in mathematics to review The 2017 Mathematics Framework and provide recommendations regarding revisions needed for the NAEP Mathematics Framework to reflect current research and knowledge in mathematics, mathematics instruction, learning mathematics, and assessment of mathematic concepts. The experts are:

- Kevin Dykema, Eighth Grade Mathematics Teacher, Mattawan Middle School (Michigan) and National Council of Teachers of Mathematics Board Member
- Gladis Kersaint, Dean and Professor, University of Connecticut, Neag School of Education
- William McCallum, Professor, University of Arizona and President, Illustrative Mathematics
- Diana Suddreth, Director of Teaching and Learning, Utah State Board of Education
- Zalman Usiskin, Professor, Emeritus, The University of Chicago and Director, The University of Chicago School Mathematics Project

The experts submitted their recommendations in writing. Those recommendation papers are included in the following pages. They will present their recommendations and participate in a discussion with members of the Assessment Development Committee (ADC) on Friday, May 18, 2018 during a Panel Discussion: NAEP Assessment of Mathematics at the National Assessment Governing Board’s May quarterly meeting in Montgomery, AL. Dale Nowlin (ADC Member) will facilitate the discussion.
Time for Revision: Updating the Framework to Stay Current

Kevin Dykema

The time has come for the *Mathematics Framework for the 2017 National Assessment of Educational Progress* (NAEP) to be updated. Regardless of how one feels about the value of the Common Core State Standards (CCSS), there is little doubt that most states either use those standards or have created their own standards that very closely model the CCSS. With the overwhelming majority of American students now learning the same mathematical content in the same grades, it is time for the NAEP framework to better reflect this.

When I was an early career teacher, I remember an administrator talking about three types of curriculum- the written, the implemented, and the assessed (English, 1992). When all three match, true progress can be made. These three don’t currently match and it is time to make some changes to the assessed curriculum. This paper will elaborate on why changes should be made to the mathematics framework and what types of changes should be made.

There are several instances where content is tested before most state standards have it taught. The first is **fourth grade statistics and probability**. Work with measures of center (mean, median, mode) is found in 6th grade standards. While work with this topic is likely begun informally in prior grades (Cohen, 2012), the formal language occurs in 6th grade state standards and it seems quite unfair to test language in 4th grade that the students haven’t yet formalized. The same concern occurs for the concept of range. It is definitely addressed in earlier grades, but in the context of number operations. For example, students are asked to find the difference between the highest and lowest dots in a line plot with fractions in the 4th grade CCSS (4.MD.4),
without formally calling it the range. A greater area of concern is probability, which should not be tested in 4th grade. In state standards, formal work with probability now begins in 6th grade. Students have little exposure to formal probability language in prior grades.

A second major area that includes content taught in later grades is fourth grade algebra. In the existing framework, 4th grade students are asked to recognize and describe proportional relationships. However, this is a topic that isn’t formally addressed with the proportional language until 6th grade. The notion of a variable, which is a letter used to represent a number, begins in 6th grade in most state standards. However, there are several places where variables appear in the 4th grade in the NAEP Mathematics Framework. As an eighth-grade teacher, I still have a few students who struggle with the concept of a variable after several years of working with them; it definitely shouldn’t be tested in 4th grade with no prior exposure to the concept.

There are also instances of content included in state standards that are not in the existing framework. As Hughes, Daro, Holtzman, and Middleton (2013) have argued, not including content that is taught can result in NAEP underestimating student growth. Because of this, major content that is taught should be assessed on NAEP.

The biggest example of this omission occurs in 8th grade. Solving systems of equations, both graphically and algebraically, are included in 8th grade state standards, but don’t get assessed until 12th grade on NAEP. In fact, solving systems of equations (as well as work with linear equations) is one of the three major focal areas for the 8th-grade CCSS. Not including this topic that eighth graders spend a significant amount of time learning should be changed.
These examples of content mismatches between what is being taught and what is being assessed highlight the necessity of a mathematics framework update. In addition, consideration needs to be given to how the existing framework standards are written and assessed.

Current state standards put a heavier emphasis on a balance between conceptual understanding, procedural fluency, and applications than did prior sets of standards; this balance is often referred to as “rigor.” It is no longer good enough that students can memorize a procedure (algorithm) for solving a problem; they now need to understand why it works and be flexible in their reasoning. When many teachers were in school, they learned to add multi-digit numbers or multiply two 2-digit numbers by memorizing the steps and then repeatedly practicing them to gain procedural fluency. Current state standards call for solving such problems based on strategies and algorithms based on place value understanding and on properties of operations to gain conceptual understanding. This major shift should be reflected in an updated mathematics framework as the existing framework focuses more heavily on the procedural fluency. As the National Council of Teachers of Mathematics (NCTM) advocates, procedural fluency should be built from conceptual understanding (NCTM, 2014).

Changes to the formats and types of questions should also be considered. A major change with the adoption of CCSS and other state standards is the inclusion of the Standards for Mathematical Practice, a set of eight (some states have a different amount) “habits of mind” that students should develop. One of these practices, “Construct viable arguments and critique the reasoning of others” should be reflected in an updated mathematics framework. There should be questions on future NAEP assessments that ask students to demonstrate this important skill; this could be done with either selected response or constructed response items.
With the transition to digital NAEP, consideration should be given to including selected response items with multiple correct answers. This is already occurring in many states and should be included on NAEP. Students can no longer guess on an item and randomly select the one correct answer; they need to reason through each of the items and determine which ones apply. These multiple correct response items would be a great way to assess the conceptual understanding of students as well as allowing them to critique the reasoning of others.

The above suggested changes illustrate the necessity of revising the mathematics framework. The framework needs to be revised, but creating an entirely new framework is unnecessary. The work to be done can be accomplished within the existing framework as the vast majority of the existing framework is still relevant. Determining the actual changes should, as in the past, include input from a variety of constituents, including classroom teachers.

Ideally these changes could be made while maintaining the existing trend line, so that student performance can be compared to past years. This ability to compare with past years is a strength of NAEP. However, assessment experts would have to be consulted to determine the feasibility of maintaining trend following changes to the framework.
References


Review of the NAEP Mathematics Framework

Gladis Kersaint

I was asked to review the Mathematics Framework of the 2017 National Assessment of Educational Progress (referred to as Mathematics Framework, hereafter) and answer the following questions: Does the NAEP Mathematics Framework need to be revised? If so, why and how? As stated in the document, the framework “lays out the basic design of the assessment by describing the mathematics content that should be tested and the types of assessment questions that should be included” (p. 2). Although the NAEP Mathematics Framework is not intended to represent any particular curriculum or what is taught, I reviewed the content of the Common Core Standards for Mathematics and the Guidelines for Assessment and Instruction in Statistics to ground my thinking in current expectations for K-12 students. I believe the anticipated review of curriculum standards across the nation conducted by the Governing Board will provide additional insights from the field, represented by state curriculum documents, about what students should know and be able to do by grades 4, 8, and 12. Information from this review is not yet available, and as a result, was not taken into consideration.

As I read each of the chapters of the Mathematics Framework, I asked myself the following questions: Does this chapter do what it is intended to do? Are clarifications needed? If so, what? Is anything missing? Does it reflect current understandings/interpretations in the field? In what ways might the field benefit from a revision of the document? As I attempted to answer these questions, I maintained focus on the intent of the assessment framework as described earlier. Below I provide conclusions drawn after reading each chapter of the NAEP Mathematics Framework. In some cases, I provide examples to illustrate what is meant.
Chapter One: Overview

Chapter 1 provides a historical overview of the development of the framework and the changes that were made overtime. It outlines the intent of the assessment framework, clarifies what it is and what it is not; provides context for the changes that were made; and provides an advance organizer for the types of information to be provided in the remainder of the document. I wondered if the first chapter could include summary information about the administration of the test and the tools available to test takers during its administration (e.g., manipulatives and calculators, etc.). Although this information is discussed in Chapter 5, it might be helpful to have this information as one reads some of the objectives discussed in Chapter 2. For example, when I read “…use appropriate measurement instrument…” for Grade 4, I wondered how that objective would be addressed as part of the assessment. Because this is clarified in Chapter 5, I present it here as something to consider rather than a change that must be made.

Chapter 2: Framework for the Assessment

“This chapter presents the content areas, distribution of items by content, a description of the matrix format, and a detailed description of each content area followed by the specific objectives of the mathematics framework for that area” (p. 5). Overall, the broad areas of mathematics content (Number Properties and Operations; Measurement; Geometry; Data Analysis, Statistics, and Probability; and Algebra) continue to be relevant and the objectives identified for grades 4, 8, 12 are clear and account for expected growth of knowledge across the grade levels. I believe the addition of mathematical reasoning that first appeared in the 2005 framework is an important one. I did not note any gaps or missed content for consideration. Therefore, I am not recommending any changes to the subject matter content addressed in the Mathematics Framework.
Chapter 3: Mathematical Complexity of Items

Chapter 3 describes the three levels of mathematical complexity of items (e.g., low, moderate, or high), which describes the cognitive demand associated with specific test items. This section includes sufficient information to understand the intent and focus of each of the complexity levels and includes examples to clarify why items are labeled as they are. I have no recommended major changes to this section. However, I highlight a minor editorial suggestion for a sentence in the rationale section of Example 11 (p. 44).

- Current statement: “At grade 8, students have not learned a procedure for answering this type of question.”
- Proposed revisions bolded: “At grade 8, students might not have not learned a procedure for answering this type of question.”

I am noting this statement because I found it to be substantively unlike the other statements made in this section because it implied definitive knowledge about what students at a particular grade have not learned. I am suggesting the use of tentative language to acknowledge the increasing number of students who are enrolled in the equivalent of a high-school Algebra 1 course in grade 8 who may have greater exposure to this type of reasoning.

Chapter 4: Item Formats

Chapter 4 describes the item formats (multiple choice, short constructed response, and extended constructed response) that continue to be appropriate for the assessment. However, it is important to acknowledge that the use of a digital platform may provide different options for item formats, which include multi-select items, grid items, table items, or equations as is used in other digital assessment platforms such as those used by Smarter Balanced Assessment.
Consortium (SBAC) or Partnership for Assessment of Readiness for College and Career (PARCC).

The examples and the scoring guide adequately clarify the intent of each type of format and how assessment items are scored. However, all examples illustrated in this section reflect the types of questions found on a paper-pencil type of exam. Because the NAEP assessment will be administered in a digital environment with dynamic capabilities, it should include examples that highlight the assessment tools and the dynamic options that will be available as well as the various ways available to provide a response. For example, the grade 4 and grade 8 sample items from SBAC shown in Figure 1 provide some indication of the features that will be available during the example.

![Sample Items from Smarter Balance Assessment](image)

At the beginning of June, a bean plant was \(3\frac{4}{5}\) inches tall.

By the beginning of July, the plant was \(6\frac{2}{5}\) inches tall.

How many inches did the plant grow during June? Enter your answer in the response box.

Figure 1. Sample Items from Smarter Balance Assessment.
Chapter 5: Design of Test and Items

Chapter 5 describes the guidelines for balancing a number of factors, “including content, level of complexity, and format” (p. 4). Overall, I found the balance of content, mathematical complexity and item formats to be appropriate, therefore I am not recommending changes in those areas.

Calculators and Manipulatives. If the digital assessment will permit students to use virtual tools (e.g., calculator, manipulatives), it will be important to include examples to show the types of online calculators that will be available as was suggested in the previous section (see Figure 1).

Accessibility. This section currently states that the “exam provides accommodations for students with special needs” (p. 66). I believe this is a limited perspective given the use of a digital platform, which may permit different options for making the exam accessible. I
recommend the use of a universal design, which allows accommodations that are typically made available for a specific group to be available to all test takers. Then, accommodations can be identified for specific situations that cannot be addressed within the digital platform (e.g., the need to administer the test in an alternative location). For example, screen readers (i.e., text to speech) can be made available to all students, including students who are not identified with specials needs such low-ability readers, without compromising the integrity of the mathematics content to being assessed. Also, with the availability of online translators, it might be possible to offer primary or home language translations of the test content beyond the focus on Spanish.

Overall, this section should reflect the nature of the technological tools that are available on the digital platform and highlight how these features provide access to all students, including those with specific special needs. This shifts the focus to the accessibility of the exam for all students and away from the types of students who might receive particular accommodations.
Shifts in state standards since 2005

The content expectations in the NAEP framework at grades 4 and 8 have remained essentially unchanged since 2005, and at grade 12 since 2006. During that time there has been significant change in state standards, starting with Achieve’s *American Diploma Project*, through the 2010 Common Core State Standards in Mathematics (CCSS-M), and continuing today.

*From confusion to consensus.* In 2005, the distribution of grade levels at which a given topic was addressed across different state standards was extremely wide. For example, the grade in different state standards at which students begin to add and subtract fractions ranged from 1 to 7, with solid pluralities in grades 3, 4, and 5 (Reys, 2006). Today, the approximately 40 states that have adopted CCSS-M or similar standards place this expectation at grade 4, the same grade as NAEP. In 2006, states had standards on proportions ranging from grades 3 to 8 (Reys, 2006). Now there is solid agreement that proportions start in grade 6 or 7, whereas in NAEP they are on the grade 4 assessment (Achieve, 2016). The state consensus has led to focus on the most important mathematics for each grade level.

*From strands to structure.* Most standards in the mid 2000s were organized by strands that spanned all grades from kindergarten to grade 12, such as number, measurement, geometry, and algebra. This arrangement, allowing for algebra all the way back to kindergarten and number all the way to grade 12, gave license to the mile-wide-inch-deep curriculum in which we “introduce topics early and then repeat them year after year” (Schmidt, Houang, & Cogan, 2002). In contrast, most state standards today follow progressions in which one topic leads to another,
with, for example, a focus on arithmetic in grades K–5 leading to a focus on algebra in grades 6–8. Furthermore, standards within a topic are often arranged in conceptually-related clusters, which “helps to maintain coherence, ensures that standards are related, and discourages the inclusion of disconnected skills” (Achieve, 2016).

**Balance of procedural fluency, conceptual understanding, and applications.** During the 90s and early 00s, debate raged about which of these three was the appropriate foundation for a sound mathematics education, contributing to sudden swings in state standards. In its final 2008 report, the National Mathematics Advisory Panel (NMAP) called for an end to this false trichotomy: “To prepare students for Algebra, the curriculum must simultaneously develop conceptual understanding, computational fluency, and problem solving skills. Debates regarding the relative importance of these aspects of mathematical knowledge are misguided” (NMAP, 2008). CCSS-M embraced this balance, which persists to this day in state standards.

**Implications for NAEP**

Because NAEP is constrained by what is actually happening in classrooms, the previous confusion of state standards necessarily showed up in the NAEP assessment framework. The current consensus makes possible a more focused assessment than was possible in 2005. Furthermore, it allows for greater specificity for item developers. Hughes, Daro, Holtzman, and Middleton (2013) noted the lack of specificity in certain areas as a problem.

The shift to more focused and coherent standards has caused some misalignment between NAEP and the states, both in testing things that are not taught, and in not testing things that are taught. For example, the number line, an important tool for understanding fractions, is underemphasized in grade 4 NAEP relative to state standards (Hughes et al., 2013). In grade 8 NAEP, solving
systems of linear equations is absent, whereas it is an important topic at grade 8 in current state standards (Hughes et al., 2015). On the other hand, NAEP, following the strand model, tests many topics inappropriately early, for example patterns, medians, and proportional relationships in grade 4. For a comprehensive list, see Zimba (2015). As a result of these misalignments, NAEP may not be capturing educational progress accurately.

An important dimension of NAEP is the classification of items into low, medium, and high mathematical complexity. Placing too many topics early could confound this classification. To quote the 2017 NAEP framework, “The demands on thinking that an item expects—what it asks the student to recall, understand, reason about, and do—assume that students are familiar with the mathematics of the task.”

The approach to algebra in NAEP does not reflect the current approach in CCSS-M, and is therefore at odds with standards in most states. Compared to these standards, grade 4 NAEP pays less attention to conceptual basis for algebra in properties of operations; no attention to number line interpretation of fractions or understanding fractions as quantities; and no attention to the role of place value in ordering and comparing whole numbers, or to the importance of attending to the whole in ordering and comparing fractions (Hughes et al., 2013). At grade 8, the balance found in CCSS-M between expressions, equations, and functions is not well reflected in NAEP (Hughes et al., 2013).

Finally, we note that the level of modeling complexity in current state standards for high school is not reflected on grade 12 NAEP.
Recommendations

From the point of view of content alignment there is a clear case for revising the NAEP framework. We recommend:

1. A move away from the strand model to an organization that takes account of the progression of domains in K–12 mathematics and that groups standards in conceptually-related clusters. The corresponding change in reporting could give more specific information than currently available, for example on students’ skills in multi-digit computation in grade 4.

2. Address obvious topic mismatches as noted in recent alignment studies.

3. Increase the specificity of the framework in areas where overly broad standards provide insufficient guidance to item developers, for example in grade 8 algebra.

4. Raise the level of modeling complexity in the high school standards.
References


NAEP Framework Response

Diana Suddreth

The 2017 NAEP Mathematics Framework lays a respected foundation for assessing student knowledge in mathematics at grades 4, 8, and 12 and is a useful portrait of trends in student abilities; however, there are considerations that should be addressed in the revision of the framework to better represent current research and practice regarding student learning.

The NAEP assessment is highly valued in many states to measure progress over time and assess local standards, programs, and student achievement. As the National Assessment Governing Board considers changes to the framework, they should also assess how the continuity of reporting can be maintained so that researchers and policy-makers can make connections to previous years, policies, and practices.

A primary consideration for change must be linking the framework to current research and practice while eliminating anachronistic material. Citations in the 2017 NAEP framework are mostly from the turn of the 21st Century, ignoring advancements such as the Common Core State Standards (CCSS), the Guidelines for Assessment and Instruction in Statistic Education (GAISE), the Guidelines for Assessment and Instruction in Mathematical Modeling Education (GAIMME), and the national focus on Science, Technology, Engineering, and Mathematics (STEM). These advancements, along with research about how children learn mathematics must be attended to in the next revision of the NAEP framework.

Even though every state has not adopted the CCSS, the development of the standards and their widespread implementation, coupled with agreement about learning trajectories, have resulted in
an era where states agree regarding placement of most topics in mathematics. Even states who have not adopted the CCSS have adjusted timelines so that students across the United States experience many of the same topics at the same grade level. Furthermore, state standards across the United States have placed ever more emphasis on reasoning and modeling with mathematics to solve problems. Although this paper is too short to give a comprehensive accounting of potential issues with the current framework, a few examples will illustrate the point.

The current NAEP framework recognizes geometry as an essential topic in mathematics; however, it does not capture the academic importance of transformational geometry at the appropriate ages. Transformations are an important facet of developing concepts of congruence and similarity so that students can not only identify aspects of geometry, but also justify them. No more are transformations the “flips,” “turns,” and “slides” in the current framework, but rather the building blocks of “reflections,” “rotations,” and “translations.” As such, what could previously be assessed in 4th grade, must now be assessed in 8th grade where these concepts are established. The precise language of mathematics supported in the CCSS and in state standards can and should be used in eighth grade where these ideas are developmentally appropriate.

Statistics is another area where framework writers must look at new research. The GAISE Standards informed the CCSS and as a result there has been considerable movement in the study of statistics. Probability and measures of central tendency are no longer topics in elementary school. Fourth grade items should be limited to bar and picture graphs while eighth grade may include more sophisticated data displays.

As a final illustration, authors should consider learning trajectories for proper placement in the framework. The current framework assesses proportionality in 4th grade, yet 4th grade students
are just solidifying their knowledge of rational number and will not fully understand proportionality until 8th grade. The topics in the framework are important, but the result of states aligning expectations to research is that not all topics are placed at the appropriate level.

No doubt placement of specific mathematics topics will be a challenge. Despite the CCSS and state efforts at alignment, there are still regional differences. One potential answer to this challenge is to provide students with more opportunities for modeling and problem solving throughout the assessment which will result in multiple entry points and multiple paths to solutions. State standards now emphasize reasoning, precision, and justification through communication. Ideally, NAEP would capture the results of efforts in these areas. Such items have been a strength of NAEP in the past and might be an area for further focus in the future.

In 2009, the NAEP Framework added a new topic of mathematical reasoning at grades 4, 8, and 12. While it is commendable that the NAEP assessment attends to mathematical reasoning, separating it from the content of mathematics gives a false sense that reasoning is somehow separate from number, data analysis, algebra or geometry. Mathematical reasoning is not a mathematical topic to be segregated from more traditional aspects of mathematics but is a tool to be used whenever approaching an unfamiliar mathematics problem. There may be some value in reporting on student abilities in mathematical reasoning, yet it is more important that reasoning permeate the assessment. Currently, important opportunities are lost. There should be many occasions for students to justify thinking in multiple areas not limited to geometry, and certainly not limited to recall of definitions or theorems. Students should be expected to justify their thinking in algebra, number, and probability and can do so either formally or informally if given a chance.
In addition to the content issues, the NAEP Framework authors could consider revision as an opportunity for other improvements. In writing introductory paragraphs regarding the history of mathematics, authors should take care to represent more than a Western approach. One cannot help but notice that Descartes is mentioned by name, yet Muhammad ibn Musa-al-Khwarizmi, the father of Algebra, is not. This omission leads one to wonder how equity issues are considered in the development of the assessment. A statement in the framework regarding the selection of contexts for mathematics that ensure equitable access would give notice that equity is attended to.

For the NAEP assessment to equitably assess student learning, the framework should also address current accommodations. While Spanish is the most common non-English language spoken by children in the United States and Spanish forms are helpful, there are many more languages spoken in schools today. In some states, languages other than Spanish are more common such as Ilokano in Hawaii. Accessible dictionaries in other languages could be a first step towards providing access for English Language Learners.

In addition, students with disabilities now have many more accommodations available to them than are included in the NAEP framework. Braille and assistive technology communication devices should be considered to accommodate access for more students. As equity is a priority for all of us, it is an area that NAEP could address more completely in the framework.

Another opportunity for increasing student access and interest in the assessment would be making more connections with other STEM fields. This could be explained in the introductory paragraphs where it could be clear that STEM contexts are an important way for students to show their ability to use mathematics in purposeful settings. This would result in a more
authentic assessment not only of mathematics itself but also as a tool to be used in many disciplines.

Many improvements could be realized by making a thorough analysis of the verbs used in the framework. Verbs such as “solve,” “perform,” and “evaluate” are important and should be balanced with verbs such as “construct,” “model,” and “justify.” Use of technology, somewhat new to NAEP, enables the design of more robust items where students create quick constructions and models that bridge the world between selected and constructed response.

One further non-content suggestion would be to consider adding a “Below Basic” reporting category. This would align much better with how states typically assess students and recognizes the unfortunate reality that there are students who are not able to do what is expected of them, especially considering the increased rigor of the CCSS and newly adopted state standards. NAEP can help uncover pockets where these deficiencies are most profound and give states much needed data to inform resource acquisition and allocation.

There are many considerations for the Board in revising the NAEP framework, ranging from grade alignment, to research, to connections to other disciplines (STEM). If the NAEP framework is rewritten to consider content alignment with commonly accepted standards and trajectories, equitable access and equity in presentation, and attention to the practices of mathematics, it will continue to be the trusted report card that it currently is.
References


Utah State Board of Education. (2016c). *Utah core state standards for mathematics middle/junior high school grades 6-8*. Retrieved from

http://www.schools.utah.gov/curr/mathsecondary
Should the Current NAEP Mathematics Framework Be Changed - And, If So, Why and How?

Zalman Usiskin

To answer the question in the title of this essay, I consider five current major trends of mathematics in society in general, and in education in particular (numbered [1] through [5] below), and the implications of these for the current NAEP frameworks at grades 4, 8, and 12.

(1) The increasing importance of statistics and financial mathematics to the citizen and in careers. From understanding the variability of results of polls to the probabilities inherent in medical diagnoses, lotteries, and investments, today’s citizen needs to be able to make decisions based on statistical information. Today’s citizen needs to be familiar with the mathematics of loans and mortgages and long-term financial planning and, if the citizen is an investor, to understand the relationship between risks and rewards. The current NAEP framework creators had the foresight to allot 10% of the items at grade 4, 15% at grade 8, and 25% at grade 12 to data analysis, statistics, and probability.

Implication 1: The current percents allocated to data analysis, statistics, and probability seem appropriate at all three grade levels. For what might be taught 10 or 15 years in the future, an argument might be made for increasing the grade 12 (and perhaps even the grade 8) allocations to 30% and 20%, respectively, but no greater.

(2) The increasing breadth of college-level applications of mathematics. A report of the National Research Council (NRC) describes this growth as follows: “Mathematical sciences work is becoming an increasingly integral and essential component of a growing array of areas of
investigation in biology, medicine, social sciences, business, advanced design, climate, finance, advanced materials, and much more” (NRC, 2013).

**Implication 2:** K-12 mathematics, and thus future NAEP assessments need to cover groundwork not only for traditional calculus but also for important mathematics apart from calculus.

(3) The increasing availability of technology (computer, calculator, smartphone) that can *do* mathematics. Smartphones everywhere are equipped to do arithmetic computations. As a result, outside of school, paper-and-pencil computation has become virtually obsolete. In its place, on the job and in the marketplace, there is general recognition that mental arithmetic and estimation of reasonableness of answers are critical skills. Free or inexpensive dynamic geometry software can manipulate geometric figures; computer algebra systems can do all the symbolic algebraic manipulations that students have historically been expected to do by hand. Based on the current NAEP frameworks, in the 2017 NAEP assessment there exist items at all grade levels for which a student was expected to use a calculator: 4-function at grade 4, scientific at grade 8, and graphing calculators at grade 12. Also, estimation is one of the six components of the “number properties and operations” content area at all three tested grade levels.

**Implication 3:** The current calculator policies should be maintained. More sophisticated technologies have not gained enough traction in classrooms to definitively warrant inclusion in NAEP, but a future-looking assessment – particularly because students are already taking NAEP on computers – might include items at grades 8 and 12 to test student ability to use and interpret results found by more sophisticated technology that does algebraic manipulations.
The existence of the international studies Trends in International Mathematics and Science Study (TIMSS, since 1995) and Program for International Student Assessment (PISA, since 2003). TIMSS involves 4th, 8th, and 12th-graders in the U.S. and is generally viewed as testing academic content much like NAEP. In contrast, PISA measures 15-year-olds on applying mathematics to real-world problems in real-world contexts. In 2015, 72 countries participated in PISA, 49 at 4th-grade TIMSS, 38 at 8th-grade TIMSS, and 9 at advanced TIMSS. The international studies have provided interesting benchmarks for U.S. student performance, but the reasons for the scores of the highest-performing countries involve far more than curriculum (Usiskin, 2012).

Implication 4: The growing breadth and importance of mathematical applications, as mentioned in (1) and (2) above, bolstered by the international popularity of PISA, suggests that adding a PISA-like domain of mathematical literacy to domains in the current NAEP 12th-grade framework should be considered.

The widespread use of the CCSS-M (CCSSI, 2010) and state-level variants, state tests, and guidelines for publishers (www.corestandards.org, 2012, 2013). Although U.S. Secretary of Education Betsy DeVos declared that the Common Core is dead (U.S. Department of Education, 2018) and will receive no funding at the national level, the CCSS-M remain powerful determiners of what is taught in almost all states. With only a few exceptions, all states have curricula that follow or closely emulate the Common Core, and the “state-specific editions” of popular textbook series in grades K-8 are typically the “Common Core edition” modified to handle discrepancies in individual states and without identification of standards in non-Common Core states. However,

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1 A history of U.S. participation in international studies can be found in Dossey, McCrone, & Halvorsen (2016), pp. 67-86.
Secretary DeVos’s declaration reflects significant dissatisfaction with the Common Core on many fronts, and not just from political conservatives. As Behuniak (2015) noted in a NAEP validity study, “The reduction of state participation in SBAC and PARCC, combined with the increasing discontent with the CCSS, significantly increases the likelihood that NAEP will continue to serve as the nation’s report card for the foreseeable future.”

**Implication 5a:** The Common Core has a questionable future, and for this reason any move of NAEP towards the CCSS-M should be minor.

The CCSS-M standards are by individual grade for each of the grades K-8, because the CCSS-M were designed with the goal of testing at each grade from grades 3-8 in mind. So, the CCSS-M provides a year-by-year sequence of instruction in each area of its standards. Because the NAEP tests are given only at grades 4 and 8, the NAEP frameworks should not focus on the sequence of instruction but continue to focus on the final product.

**Implication 5b:** The greater detail of the CCSS-M is necessary in part due to testing at each grade and does not constitute a significant consideration for changing anything in the NAEP frameworks at either grade 4 or grade 8.

The intent of the CCSS-M authors was to deliver a “more focused and coherent curriculum” (CCSSI, 2010). Consequently, the guidelines for publishers to strip their programs of content not directly associated with a Common Core standard at that grade. Teachers and teaching materials are judged by their adherence to the CCSS-M with reluctance to include anything that is not a recognizable standard (for criteria, see www.corestandards.org, 2012, 2013, https://www.edreports.org/about/index.html). Furthermore, the CCSS-M discourage putting students in algebra in grade 8 and calculus in grade 12. The result is that students receive a
curriculum that is purposely deeper but narrower in breadth. This is particularly true in grades K-4, where the CCSS-M have no statistics, less algebra, and less geometry; in all of K-8, where there is no mention of calculators (and there is an increase in paper-and-pencil computation with decimals from what most states had in their earlier standards); and in grades 9-12, where the CCSS-M identify a curriculum that is aimed at calculus and does not cover those students (likely a majority, even in the future) who will not need calculus for their careers, whereas NAEP frameworks are designed for the mathematics needed by all students.

Implication 5c: The NAEP frameworks should remain broader than CCSS-M at all levels.

Although Daro, Hughes, and Stancavage (2015) suggested that the Governing Board add content to the grade 8 NAEP framework to bring it in agreement with the CCSS-M, there are reasons that would be unwise. Fundamental among these is that there exists little data to indicate that the CCSS-M have improved mathematics performance – even on tests designed specifically to cover the Common Core (Loveless, 2018; SBAC, 2018). Moving the NAEP Frameworks towards the Common Core would constitute an endorsement of a curriculum that has not proved itself even with ample opportunities throughout the nation for such proof. In each of the states, data exist to indicate whether the Common Core or other standards are being reached in that state, and to determine whether student performance has improved or not; in each state an independent broader-based assessment is exactly what is needed to counter the narrowness of the CCSS-M. NAEP presents the only ongoing national evaluation that can compare current performance with performance before 2010 (see, e.g., Loveless, 2018).

Implication 5d: Bending NAEP frameworks to the CCSS-M Standards would cause unnecessary redundancy in testing, lessen opportunities for historical comparisons, and
serve to stifle attempts to update the mathematics curriculum in the U.S. to reflect the changes in mathematics noted at the top of this essay.

“Historically the NAEP frameworks have aspired to represent the union of all the various state curricula while reaching beyond these curricula to lead as well as reflect. As a result, NAEP often has pushed on the leading edge of what the nation’s children know and should be able to do” (Hughes, Daro, Holtzman, & Middleton, 2013, emphasis mine). I hope that the Governing Board enables NAEP to continue this fine and valuable tradition.

References


https://www.air.org/sites/default/files/downloads/report/NVS_combined_study_1_NAEP_alignment_with_CCSS_0.pdf


NEXT STEPS FOR ADC FRAMEWORK ACTIVITIES

The ADC develops recommendations for what NAEP should assess. By engaging a wide array of stakeholders, each NAEP framework details these recommendations, describing what students should know and be able to do in a subject area and what will be tested on NAEP. Framework panels review assessment trends internationally. The panels also make recommendations for what should be included in NAEP questionnaires to provide context on student achievement.

In balancing the factors that determine the content that is most important to assess, recent ADC discussions have focused on several issues that will inform recommendations for Board deliberation and action, which include:

- Optimal role of NAEP for each content area.
- Expected gains and losses for each framework decision.
- Extent to which current frameworks are flexible enough to adapt as needed to changes in the field.
- Whether to more deeply assess an existing content area or add new content areas.
- Whether streamlining of NAEP frameworks is an appropriate goal.
- How to be intentional about content overlap between different assessments, while fulfilling statutory requirements, e.g., biennial reading and mathematics assessment.
- Level of specificity most useful to policymakers, researchers, and educators.
- How to establish and maintain partnerships that highlight actionable aspects of results, e.g., teacher access to released NAEP items and contextual information.
- Consideration of how other countries think about changing what they assess.
- How future NAEP items will be a resource for the field.
- How Board and Committee priorities should be reflected in upcoming framework updates.

The Strategic Vision Implementation Activities Report across all Board committees is presented in the Executive Committee tab. A working draft of ADC’s plan for future work is attached, reflecting overarching projects for informing educators, updating policies, and exploring new approaches. More detailed timelines are presented for the NAEP Mathematics and Reading frameworks, the first two framework projects planned. A summary of common elements for each framework project follows.

Next Steps

At the March 2018 Board meeting, the ADC will have an opportunity to discuss next steps to support upcoming activities and policy decisions, with particular emphasis on the NAEP Mathematics Framework and the ADC recommendation to be presented for Board action in August 2018.
### WORKING DRAFT PLAN: ALL ADC STRATEGIC VISION (SV) ACTIVITIES

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>START</th>
<th>FINISH</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify NAEP Resources &amp; Information for Educators (SV #3 Expanding NAEP Resources and SV #6 Contextual Variables)</td>
<td>May 2017</td>
<td>Nov 2021</td>
<td>ADC discussed NAEP Questions Tool and contextual variables in 2017. Suggestions for new or refined NAEP resources can be shared with R&amp;D for Board outreach. To be determined: when/how to develop ADC recommendations.</td>
</tr>
<tr>
<td>Explore New Approaches to Framework Update Processes (also SV #8 International Assessments)</td>
<td>Nov 2017</td>
<td>Aug 2023</td>
<td>The Board’s Technical Services contractor is an opportunity for analyses exploring innovations in how NAEP assessment updates are implemented. Framework Update Projects will review other countries’ assessment programs to inform frameworks, framework processes, contextual data, and reporting.</td>
</tr>
<tr>
<td>Review &amp; Update Civics, Geography, and U.S. History Frameworks (Depends on NAEP Schedule)</td>
<td>Mar 2018</td>
<td>May 2020</td>
<td>Discussion of outreach began in March 2018, with suggestions to develop options for the ADC to consider. Review of current NAEP item pools will also inform ADC recommendations.</td>
</tr>
<tr>
<td>Review &amp; Update Economics Framework (Depends on NAEP Schedule)</td>
<td>Mar 2020</td>
<td>Aug 2021</td>
<td>Depending on ADC recommendations and Board Assessment Schedule decisions, Economics may or may not be a standalone project.</td>
</tr>
<tr>
<td>Review &amp; Update Science and Technology &amp; Engineering Literacy (TEL) Frameworks (Depends on NAEP Schedule)</td>
<td>Sep 2020</td>
<td>Nov 2022</td>
<td>Discussion of outreach began in March 2018, Tentative next steps: learn more about standards in NGSS non-adopter states and learn whether stakeholders view that some or all of the TEL subarea on Technology &amp; Society addresses student achievement goals in Civics, Geography, U.S. History, or Economics.</td>
</tr>
<tr>
<td>Develop Content Descriptions for the Long-Term Trend Mathematics and Reading Assessments (SV #7Long-Term Trend)</td>
<td>TBD</td>
<td>TBD</td>
<td>March 2018 discussion called for content outlines to be useful for LTT deliberations and efforts to describe the knowledge and skills of lower performing students. Staff is preparing an implementation plan regarding how content outlines can be developed.</td>
</tr>
</tbody>
</table>

¹ All timelines are estimated. This draft will be updated based on Board policy decisions. All activities address Strategic Vision Priority #5 Updating Frameworks, unless otherwise noted.

¹ Timeline includes administering the assessment.
## MATHEMATICS Framework: Expected Milestones

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Mathematics Standards&lt;sup&gt;3&lt;/sup&gt;</td>
<td>To be completed in May 2018.</td>
</tr>
<tr>
<td>ADC Discussion with External Experts in Mathematics</td>
<td>Scheduled for May 2018, allowing the ADC to simultaneously review the Mathematics Standards report and engage mathematics experts.</td>
</tr>
<tr>
<td>ADC Recommendation for Updating Assessment</td>
<td>Based on May 2018 ADC discussion, the ADC will prepare a recommendation on the type of framework update needed, including a draft charge for the Visioning and Development Panels that will be convened. The recommendation would be presented for Board action in August 2018.</td>
</tr>
<tr>
<td>Board Action on Charge</td>
<td>A contractor will be selected by Summer 2018 to begin preparing and compiling resources for the Visioning and Development Panel meetings.</td>
</tr>
<tr>
<td>Framework Contractor Selection</td>
<td></td>
</tr>
<tr>
<td>Trend Scan &amp; Resource Compilation</td>
<td></td>
</tr>
<tr>
<td>Panel Meetings (3 to 6)</td>
<td>After Board action on the charge in 2018, the Visioning Panel will be convened to begin the series of Visioning and Framework Development Panel meetings to prepare a draft framework. ADC will receive ongoing updates. The full Board will review the draft when public comment is being collected. The Development Panel will use Board and public feedback to finalize the draft for Board action.</td>
</tr>
<tr>
<td>Full Board Review &amp; Public Comment</td>
<td></td>
</tr>
<tr>
<td>Framework Draft Finalized</td>
<td></td>
</tr>
<tr>
<td>ADC Final Review of Framework</td>
<td></td>
</tr>
<tr>
<td>Board Action</td>
<td>Summer/Fall 2019.</td>
</tr>
<tr>
<td>Assessment Administered</td>
<td>The Board-adopted framework will be provided to NCES by 2019. After item development, the newly updated assessment would be administered in 2025.</td>
</tr>
</tbody>
</table>

<sup>2</sup> The mathematics framework project will be implemented by the same contractor as the reading framework project, with some staggering in the schedule.

<sup>3</sup> See Attachment F for a project update.
### Reading Framework: Expected Milestones

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC Discussion with External Experts in Reading</td>
<td>Scheduled for March 2018.</td>
</tr>
<tr>
<td>ADC Continues Outreach and Prepares Recommendation for Board Deliberation</td>
<td>Summer 2018 through Spring 2019.</td>
</tr>
<tr>
<td>Board/ADC Decision on Reading Framework Update</td>
<td>This includes anticipated Board adoption of a newly extended NAEP schedule of assessments, which is slated for Board action in March 2019.</td>
</tr>
<tr>
<td>ADC Recommendation for Updating Assessment</td>
<td>Based on ADC outreach and framework reviews, the ADC will prepare a recommendation on the type of framework update needed, including a draft charge for the Visioning and Development Panels that will be convened. Board action is slated for Spring 2019.</td>
</tr>
<tr>
<td>Board Action on Charge</td>
<td>A contractor will be selected by Summer 2018 to begin preparing and compiling resources for the Visioning and Development Panel meetings.</td>
</tr>
<tr>
<td>Framework Contractor Selection</td>
<td>After Board action on the charge, the Visioning Panel will be convened in Fall 2019 to begin the series of Visioning and Framework Development Panel meetings to prepare a draft framework. ADC will receive ongoing updates. The full Board will review the draft when public comment is being collected. The Development Panel will use Board and public feedback to finalize the draft for Board action.</td>
</tr>
<tr>
<td>Trend Scan &amp; Resource Compilation</td>
<td>Summer / Fall 2020.</td>
</tr>
<tr>
<td>Panel Meetings (3 to 6)</td>
<td>The Board-adopted framework will be provided to NCES by 2020. After item development, the newly updated assessment would be administered in 2025.</td>
</tr>
</tbody>
</table>

### Common Elements of Each Framework Update Project

Based on the revised Framework Development Policy, several milestones address all NAEP assessment framework projects. Framework update projects engage stakeholders and content experts to identify needed revisions, via subject-specific factors including:

- Evolution of discipline and implications for NAEP frameworks
- Relevance to students’ postsecondary endeavors
- Student achievement trends in terms of contextual factors
- Digital-based assessment issues
- International content and measurement trends

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4 The reading framework project will be implemented by the same contractor as the mathematics framework project, with some staggering in the schedule.
MILESTONES: ALL FRAMEWORK PROJECTS

<table>
<thead>
<tr>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC Discussion with External Experts in the Subject Area(s)</td>
</tr>
<tr>
<td>ADC Recommendation for Updating Assessment</td>
</tr>
<tr>
<td>Board Action on Charge</td>
</tr>
<tr>
<td>Framework Contractor Selection</td>
</tr>
<tr>
<td>Trend Scan &amp; Resource Compilation</td>
</tr>
<tr>
<td>Panel Meetings (3 to 6)</td>
</tr>
<tr>
<td>Full Board Review &amp; Public Comment</td>
</tr>
<tr>
<td>Framework Draft Finalized</td>
</tr>
<tr>
<td>ADC Final Review of Framework</td>
</tr>
<tr>
<td>Board Action</td>
</tr>
<tr>
<td>Assessment Administered</td>
</tr>
</tbody>
</table>

As a first step, the ADC conducts a framework review, where content experts are invited to a Committee session to provide reflections on the state of the discipline and the extent to which the relevant NAEP framework should be updated. Studies and additional outreach is pursued, as needed, to inform the ADC’s recommendation about the type of framework update that is required. Next, the ADC brings its recommendation to the full Board for approval. In the case of an anticipated framework update, the recommendation includes a charge to stakeholders who will serve on the panels convened to draft recommendations for the ADC's consideration.

After Board discussion of the ADC recommendation, the Board will take action on the charge. Concurrently, Board staff will identify a contractor to execute the framework update process.

The framework contractor will launch the project by identifying individuals to serve on the framework panels and by compiling and developing resources to support the meetings of these stakeholders. A subset of these resources will include the Governing Board’s charge to the framework panels as well as documents used to inform the Board’s development of the charge. The first meeting of stakeholders will be for the Visioning Panel to discuss the major issues to be addressed in the framework. A subset of the Visioning Panel will continue on as the Development Panel to develop an updated framework. This panel will also develop the recommended updates to the Test and Item Specifications, as well as the Contextual Variables.

The ADC monitors the framework contractor’s work via regular project updates. A draft of the panels’ recommended framework will be shared for full Board review and public comment, as well as review by the Board’s Committee on Standards, Design and Methodology. This feedback will allow the Development Panel to address concerns and finalize the draft framework, specifications, and contextual variables for the ADC’s final review and Board action. The adopted framework, specifications, and contextual variables are given to NCES to begin assessment development, piloting, and finally administration of the operational assessment based on the new framework.
## Assessment Development Committee
### Item Review Schedule
**March 2018 – August 2018**  
**Updated April 9, 2018**

<table>
<thead>
<tr>
<th>Review Package to Board</th>
<th>Board Comments to NCES</th>
<th>Survey/ Cognitive</th>
<th>Review Task</th>
<th>Approx. Number Items</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/16/18</td>
<td>5/2/18</td>
<td>Cognitive</td>
<td>2019 Mathematics (4, 8) Operational (DI)</td>
<td>5-10</td>
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<tr>
<td>5/2/2018</td>
<td>5/25/2018</td>
<td>Survey</td>
<td>2019 Science (4, 8, 12) Operational</td>
<td>30-40</td>
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<tr>
<td>5/2/2018</td>
<td>5/25/2018</td>
<td>Survey</td>
<td>2019 Reading (12) Operational</td>
<td>15-25</td>
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<tr>
<td>5/2/2018</td>
<td>5/25/2018</td>
<td>Survey</td>
<td>2019 Mathematics (12) Operational</td>
<td>30-40</td>
<td></td>
</tr>
<tr>
<td>5/2/2018</td>
<td>5/25/2018</td>
<td>Survey</td>
<td>2021 Reading (4, 8) Pilot</td>
<td>30-35</td>
<td></td>
</tr>
<tr>
<td>5/2/2018</td>
<td>5/25/2018</td>
<td>Survey</td>
<td>2021 Mathematics (4, 8) Pilot</td>
<td>35-40</td>
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<tr>
<td>6/13/2018</td>
<td>7/2/2018</td>
<td>Cognitive</td>
<td>2021 Reading (4, 8) Pilot (DI)</td>
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<td>7/18/2018</td>
<td>8/10/18</td>
<td>Cognitive</td>
<td>2019 Mathematics (12) Operational (DI)</td>
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<tr>
<td>7/18/2018</td>
<td>8/10/18</td>
<td>Cognitive</td>
<td>2019 Reading (12) Operational (DI)</td>
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<tr>
<td>Date</td>
<td>End Date</td>
<td>Type</td>
<td>2019 Reading (12) Operational (SBT)</td>
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<tr>
<td>------------</td>
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</tr>
<tr>
<td>7/18/2018</td>
<td>8/10/18</td>
<td>Cognitive</td>
<td>2021 Writing (4, 8, 12) Pilot</td>
<td>70-90</td>
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</tr>
<tr>
<td>7/18/2018</td>
<td>8/10/2018</td>
<td>Survey</td>
<td>2021 Writing (4, 8) Pilot (Di)</td>
<td>18</td>
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</tr>
<tr>
<td>7/25/2018</td>
<td>8/10/18</td>
<td>Cognitive</td>
<td>2019 Science (4, 8, 12) Operational (Di)</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>7/25/2018</td>
<td>8/10/18</td>
<td>Cognitive</td>
<td>2019 Science (4, 8, 12) Operational (ICTs and hHOTs)</td>
<td>TBD</td>
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</table>

NOTE: “SBT” indicates Scenario-Based Task
“Di” indicates Discrete Item
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 am – 10:35 am</td>
<td>Welcome and Review of Agenda</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Andrew Ho, COSDAM Chair</em></td>
<td></td>
</tr>
<tr>
<td>10:35 am – 11:50 am</td>
<td>Discussion of Revised Draft Policy on Achievement Levels Setting (SV #5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Andrew Ho</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Sharyn Rosenberg, Assistant Director for Psychometrics</em></td>
<td></td>
</tr>
<tr>
<td>11:50 am – 12:00 pm</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>12:00 – 1:00 pm</td>
<td>Joint Session with Reporting &amp; Dissemination Committee: Communication and Interpretation of Achievement Levels (SV #3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Andrew Ho</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Rebecca Gagnon, R&amp;D Chair</em></td>
<td></td>
</tr>
<tr>
<td>Information Item</td>
<td>Update on Implementing the Strategic Vision (SV#2-10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Attachment C</em></td>
<td></td>
</tr>
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</table>
Discussion of Revised Draft Policy on Achievement Level Setting (SV #5)

Background

Over the past year, COSDAM members discussed the need to revise the 1995 Governing Board policy on Developing Student Performance Levels for NAEP. The Board’s formal response to the November 2016 evaluation of the NAEP achievement levels (attached) noted that several of the report recommendations would be addressed through a revision of the Board policy. In particular, the Board’s response stated that the updated policy will specify a process and timeline for conducting regularly recurring reviews of the achievement level descriptions (ALDs) and will be explicit about the conditions that necessitate consideration of a new standard setting. In addition, one of the planned activities for the implementation of the Strategic Vision is to consider new approaches to creating and updating the achievement level descriptions in the revision of the Board policy on achievement levels.

Given that the policy is over 20 years old, there is also a need to revisit the policy more generally to ensure that it reflects current best practices in standard setting. COSDAM members have acknowledged the need to seek input from multiple stakeholders throughout the process of revising the policy. To get an initial sense of the potential scope of recommended revisions to the policy, Assistant Director for Psychometrics Sharyn Rosenberg conducted informal conversations with several standard setting experts in spring 2017. Feedback from those conversations was shared with COSDAM in May 2017 and informed the additional work that has been performed since then.

As part of its Technical Support contract, the Governing Board requested that the Human Resources Research Organization (HumRRO) undertake several activities to inform the revision of the Board policy on setting achievement levels for NAEP. These activities were discussed during the March 2018 COSDAM meeting, and the Committee report is excerpted below:

Excerpt of March 2018 COSDAM Report

Best Practices in Achievement Levels Setting

Thanos Patelis of the Human Resources Research Organization (HumRRO), the project director for the Technical Support contract, described several recommendations from a 2-day, in-person meeting of experts in achievement levels setting. Mr. Patelis highlighted the following suggestions: 1) the policy should be a statement of high level guidance, and procedural details should be relegated to a new “processes and procedures” manual; 2) NAEP should develop publicly accessible interpretative guides for using achievement level results; 3) the NAEP policy definitions for Basic, Proficient, and Advanced should not be changed; and 4) the Board should provide clarification on the meaning of “general public” standard setting panelists and consider reducing their number. Mr. Patelis noted that this is not an exhaustive list of feedback, and the
Attachment A

Next, Karla Egan of EdMetric presented her review of the literature on achievement level descriptions (ALDs). She suggested that the Board consider: 1) developing multiple types of ALDs for different purposes, including item writing, standard setting, and reporting; 2) using “can” statements for reporting instead of the “should” statements that are in the current NAEP ALDs; and 3) writing descriptors for the lowest category (below Basic) which does not currently have a policy definition.

Finally, Art Thacker of HumRRO provided a brief description of his technical memo about developing a validity argument for the NAEP achievement levels, with the following suggested steps: 1) make intended inferences explicit; 2) investigate how stakeholders typically use the achievement levels; 3) create an interpretative guide; 4) craft claims necessary to support expected inferences; and 5) organize evidence for each claim into a validity argument.

**Identifying Revision Goals for the Board Policy on Achievement Levels Setting**

During and following the short presentations, COSDAM members engaged in a rich discussion about various aspects of the policy. There was general agreement with the expert panel that there is too much detail in the current policy. It was suggested that the Board balance stability and flexibility in the policy revision. That is, aspects of the standard setting that are most important, such as representation of panelists, should not vary too much across different standard settings. On the other hand, it is possible to make a statement to that effect rather than specifying exact percentages or numbers of different types of panelists. As the committee moves forward with the policy revision, it will be important to determine what should be codified for stability while allowing for flexibility to incorporate new developments in standard setting.

In terms of the standard setting participants, there was extensive discussion about the category of “general public” panelists. The current policy specifies, “one-third will represent the public, non-educator sector, for example, scholars, employers, parents, and professionals in occupations related to the content area” (p. 6). In practice, subject-matter expertise has been a requirement and these panelists have had some professional experience in the content area. COSDAM members discussed whether there should be general public panelists who do not possess subject matter expertise, and whether the number of general public panelists should be reduced. Some raised concerns that non-educators may have trouble making informed judgments about the knowledge and skills necessary for performance in a content area domain. Others noted that the general public was already represented on the Board itself, which is ultimately responsible for setting achievement levels. However, members acknowledged that it could be problematic to reduce perceived or actual general public participation in the development of the Nation’s Report Card. Sharyn Rosenberg, the Assistant Director for Psychometrics, will consult documentation from previous NAEP standard settings to provide additional information about how the
background of general public panelists may have affected their participation in the process. COSDAM members generally agreed that the policy should better clarify what is meant by “general public,” and that if the current practice is maintained, there may not be a compelling reason to reduce the number of panelists in this category.

COSDAM members discussed whether or not the Board should consider developing a policy definition and content ALDs for performance below the Basic achievement level. In the current policy, only Basic, Proficient, and Advanced are considered achievement levels. The percentage of students whose performance is below the Basic level is reported but not described. COSDAM members did not see a compelling reason to develop a description for below Basic. They noted that it is difficult to develop an informative description when the bottom of the category starts at zero; any statements would need to be in terms of what students sometimes or may be able to do. The NAEP item maps do include items below Basic and therefore provide some information about performance in this range.

Some COSDAM members raised questions about whether it is appropriate for the NAEP ALDs to be written as what students “should” do rather than what they “can” do. Prior to conducting the standard setting, “should” statements indicate the performance that is expected at each level; but after the cut scores are established, “should” statements indicate that not every student has demonstrated every skill in a given category. It may be more informative to develop separate reporting ALDs that are written in terms of “can” statements, but this would need to be based on data produced following a standard setting. That is, panels of content experts could use an item mapping approach to summarize the knowledge and skills that are typical of students in each achievement level and produce reporting ALDs for NAEP.

COSDAM members agreed that it would be helpful to develop interpretative guides and noted that strong communication and clear reporting are keys to guarding against unintended inferences. There was a suggestion to provide both examples and non-examples; that is, both appropriate and inappropriate examples of interpreting NAEP achievement levels. It is important to explain what evidence there is to justify a given use, rather than only focusing on score meaning and interpretation. A research study that is currently underway by HumRRO as part of the Technical Support contract should help to inform this effort. It would be helpful to engage in discussion with the Reporting and Dissemination (R&D) Committee on some of these issues.

Finally, COSDAM members agreed that the policy should not require gathering public comment on the cut scores, since it is not feasible to release those data prior to the official release of the Nation’s Report Card. Public comment on the ALDs and the Design Document should be sufficient throughout the standard setting process. Multiple stakeholders are engaged in the process through the standard setting panels and by representation on the Governing Board, which has the ultimate responsibility for establishing NAEP achievement levels.
May 2018 COSDAM discussion

Sharyn Rosenberg worked with COSDAM Chair Andrew Ho and COSDAM Vice Chair Joe Willhoft to produce a draft revised policy for COSDAM discussion (attached). Compared to the current policy on Developing Student Performance Levels for NAEP, the attached version reflects:

- Reorganization of principles, streamlining of language, minimization of redundancies
- Removal of details on implementation directed to staff and contractors
- Clarification on the standard setting participants, in particular the non-educator group
- Additional details about the achievement level setting process, including some practices that have become institutionalized over time (e.g., the use of “impact data”)
- The possibility of using multiple types of achievement level descriptions (ALDs), including reporting ALDs that would be created using empirical data and written in terms of what students do know and can do
- Reference to an interpretative guide that would accompany the release of NAEP results and explain how the achievement levels should (and should not) be used
- A new principle on periodic review of achievement level descriptions and cut scores, prompted by the Board’s response to the evaluation of NAEP achievement levels
- A new principle to clarify participation of multiple stakeholders at various points throughout process
- A new principle to summarize the role of the Board

During the May 2018 Committee meeting, COSDAM members will discuss the draft policy and provide feedback on the revision.

Additional planned next steps are described below:

- June 2018: COSDAM teleconference to discuss revised draft policy
- August 2018: Revised policy statement for full Board discussion
- September 2018: Seek external feedback and public comment
- October 2018: Full Board (optional) call to discuss revised draft policy
- November 2018: Board action on revised policy statement
Developing Student Achievement Levels for the National Assessment of Educational Progress

Policy Statement

It is the policy of the National Assessment Governing Board to conduct a comprehensive, inclusive, and deliberative process to develop and review student achievement levels for the National Assessment of Educational Progress (NAEP). Achievement levels consist of general policy definitions for the Basic, Proficient, and Advanced levels, specific achievement level descriptions (ALDs) for each subject and grade, cut scores that demarcate adjacent levels, and exemplar items or tasks that illustrate performance at each level. This process shall be conducted according to widely accepted professional standards, to produce results that are reasonable, appropriate, and informative to the public.

The Governing Board, through its Committee on Standards, Design and Methodology (COSDAM), shall monitor the development and review of student achievement levels to ensure that the final Governing Board-adopted achievement level descriptions, cut scores, and exemplars comply with all principles and guidelines of the Governing Board Student Achievement Levels policy.

The achievement level setting process shall be carried out by contractors selected through a competitive bidding process. The process shall be managed in a technically sound, efficient, cost-effective manner, and shall be completed in a timely fashion.

Introduction

Since its creation by Congress in 1988, the Governing Board has been responsible for developing appropriate student achievement levels for NAEP assessments. The Governing Board has carried out this important statutory responsibility by engaging with a broad spectrum of stakeholders to develop student achievement levels.

Under provisions of the National Assessment of Educational Progress Authorization Act of 2002 (P.L. 107-279), Congress authorized the Governing Board to continue its mandate for developing appropriate student achievement levels for NAEP, consistent with relevant widely accepted professional assessment standards, based on the
appropriate level of subject matter knowledge for grade levels assessed, and using a national consensus approach.

Given this mandate, the Governing Board must ensure that all achievement level setting processes align with current best practices in standard setting, and that appropriate validity evidence is collected and documented to support the intended uses and interpretations of NAEP achievement levels.

To develop student achievement levels for Board adoption, the Governing Board engages multiple stakeholders throughout the process, including:

- Teachers
- Policymakers
- Curriculum Experts
- Business Representatives
- Content Experts
- Parents
- Assessment Specialists
- Users of Assessment Data
- State Administrators
- Researchers and Technical Experts
- Local School Administrators
- Members of the Public

This policy complies with the National Assessment of Educational Progress Authorization Act of 2002 (P.L. 107-279) and the documents listed below which express widely accepted technical and professional standards for achievement level setting. These standards reflect the agreement of recognized experts in the field, as well as the policy positions of major professional and technical associations concerned with educational testing. A procedures manual shall provide additional details about how this policy is implemented. As professional standards evolve and new consensus documents are released, this policy and the procedures manual shall be updated to the extent that new professional standards require.


Principles for Setting Achievement Levels

Principle 1: Elements of Achievement Levels

Principle 2: Development of Achievement Level Recommendations

Principle 3: Validation and Reporting of Achievement Level Results

Principle 4: Periodic Review of Achievement Levels

Principle 5: Stakeholder Input

Principle 6: Role of the Governing Board
Principle 1: Elements of Achievement Levels

The Governing Board is responsible for developing student achievement levels for each NAEP assessment. Achievement levels consist of general policy definitions for the Basic, Proficient, and Advanced levels, specific achievement level descriptions (ALDs) for each subject and grade, cut scores that demarcate adjacent levels, and exemplar items or tasks that illustrate performance at each level.

Guidelines

a) The following policy definitions will be applied to all subject areas and grades in which achievement levels are set. It is the Board’s view that the level of performance referred to in the policy definitions is what students should know and be able to do, not simply the current academic achievement of students or that which today’s U.S. schools expect.

**Proficient.** This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real world situations, and analytical skills appropriate to the subject matter.

**Basic.** This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for Proficient work at each grade.

**Advanced.** This level signifies superior performance beyond Proficient.

b) Content achievement level descriptions (ALDs) translate the general policy definitions into specific expectations about student knowledge and skills in a particular content area, at each achievement level, for each subject and grade. Content ALDs provide descriptions of the expected knowledge, skills, or abilities of students performing at a particular achievement level. Content ALDs reflect the range of performance that items and tasks should measure. During the achievement level setting process, the purpose of content ALDs is to provide consistency and specificity for panelist interpretations of policy definitions for a given subject and grade. During reporting, content ALDs communicate the specific knowledge and skills represented by Basic, Proficient, and Advanced for a given subject and grade.

c) Cut scores mark the minimum threshold score, the lower bound, for each achievement level. Performance within a given achievement level begins at the cut score for that level and ends just below the cut score for the successive achievement level.

d) Exemplar items and student responses illustrate student performance within each of the achievement levels. They provide specific examples to help the public better understand what students in each achievement level can do.
Principle 2: Development of Achievement Level Recommendations

The Governing Board shall develop appropriate student achievement levels for NAEP, consistent with relevant widely accepted professional assessment standards, based on the appropriate level of subject matter knowledge for grade levels assessed, and using a national consensus approach.

Guidelines

a) A Design Document shall be developed at the beginning of the achievement level setting process, to describe in detail all planned materials, procedures, and analyses for the project. The Design Document shall be posted for public review with sufficient time to allow for a response from those who wish to provide one.

b) The development of content achievement level descriptions (ALDs) will be completed initially through the process that develops the assessment frameworks. (See the Governing Board Policy on Framework Development for additional details). The Board may then review and possibly revise content ALDs to advance the purposes they serve, whether that is guiding an achievement level setting or informing the public about the meaning of achievement levels. Whether revised or not, the ALDs that guide achievement level setting will be articulated in terms of what students should know and be able to do. There will be no content ALDs developed for performance below the Basic level.

c) An achievement-level setting panel of subject matter experts shall be convened to recommend achievement level cut scores and exemplars.

   i. To ensure that they are qualified to make the judgments required by the achievement level setting process, individual panel members shall have expertise and experience in the specific content area in which the levels are being developed, expertise and experience in the education of students at the grade under consideration, and a general knowledge of assessment, curriculum, and student performance. Each panel shall reflect diversity in terms of gender, race/ethnicity, region of the country, urbanicity, and experience with students with disabilities and English language learners.

   ii. This panel shall include both educators and non-educators who are considered outstanding in their field. The educator group shall include both teachers and other educators (e.g., curriculum directors, academic coaches, principals). Teachers shall comprise the majority of the panel, with non-teacher educators accounting for no more than half the number of teachers. The remaining panelists shall be non-educators who represent the perspectives of additional stakeholders, including parents, researchers, employers, and other members of the general public.

   iii. The size of the panels should be responsive to what current research demonstrates is best practice and operationally feasible, but should be
large enough to allow for split panels. Most NAEP achievement level settings have included approximately 20-30 panelists per grade, divided into two comparable groups with a subset of shared items.

iv. The size and specific composition of the panels may be adjusted within these general guidelines if professional standards in the field evolve.

d) Panelists shall receive training on all aspects of the achievement levels setting process to ensure that panelists are well-prepared to perform the achievement level setting tasks required of them. Training must include: the purpose and significance of setting achievement levels for NAEP; the NAEP assessment framework for the given subject area; and administration of a sample assessment under NAEP-like conditions that students experience. It is important for panelists to arrive at a common conceptualization of Basic, Proficient, and Advanced based on the content ALDs. Panelists shall be trained on each element of the judgmental task they perform, including the selection of exemplar items. They should be led by capable content facilitators (who are content experts and have previous experience with achievement level setting) and process facilitators (who have background in standard setting and experience leading panelists through the achievement level setting process). Facilitators shall take a neutral stance and not attempt to influence panelist judgments.

e) The achievement level setting method that generates cut score recommendations may differ depending upon the specific assessment. The method must have a solid research base and be appropriate for the content area, item types, number of items, scoring rubrics, and mode, as applicable.

f) Evaluations shall be administered to panelists throughout the achievement level setting process, in accordance with current best practices. Evaluations shall be part of every major component of the process, and panelists shall be asked to confirm their readiness for performing their tasks. Evaluation data may be used for formative purposes (to improve training and procedures in future meetings); summative purposes (to evaluate how well the process was conducted and provide procedural validity evidence); and to inform the Governing Board of any relevant information that could be useful when considering cut score recommendations. The panelists shall have an opportunity to indicate to the Board whether they believe the recommended cut scores are appropriate and reasonable.

g) In accordance with current best practices, feedback shall be provided to panelists, including “impact data” (i.e., the implications of their selected cut scores on the reported percentages of students at or above each achievement level).

h) The process shall consist of at least two achievement level setting meetings with distinct groups of panelists, a pilot study, and an operational meeting. The purpose of the pilot study is to conduct a full “dress rehearsal” of the operational meeting, including an opportunity to test out materials, training procedures, collection of panelist judgments, feedback given to panelists through the process, software used to conduct analyses, meeting logistics, and other essential elements of the process.
The pilot study may result in minor changes to the procedures, as well as major changes that would need additional study before being implemented in an operational meeting. The pilot study provides an opportunity for procedural validity evidence and to improve the operational meeting. At the discretion of the Governing Board, other smaller-scale studies may be conducted prior to the pilot study or in response to issues raised by the pilot study. The criteria in Guideline a apply to panelists of both meetings.

i) The Governing Board or its contractor shall convene a Technical Advisory Committee on Standard Setting (TACSS) to provide technical advice on all achievement level setting activities. Technical advice provided by standard setting experts throughout the project is intended to ensure that all procedures, materials, and reports are carried out in accordance with current best practices, providing additional validity evidence for the process and results. The Board or its contractor may also seek technical advice from other groups as appropriate, including the National Center for Education Statistics (NCES) and the larger measurement community (e.g., the National Council on Measurement in Education).

j) All aspects of the procedures shall have documentation as evidence of the appropriateness of the procedures and results. This evidence will be made available to the Board at the time of deliberations about the achievement levels. A summary of the evidence shall be available to the public when the achievement level results are reported.

k) The exemplars chosen from the pool of released items for the current NAEP assessment shall reflect performance in the Basic, Proficient, and Advanced regions of the scale. The use of exemplars is intended to help the public better understand what students who are in each achievement levels actually know and are able to do for each subject and grade. When possible, exemplars may also be chosen that reflect performance at threshold scores. The collection of exemplars shall reflect the content found in the achievement level descriptions and the range of item formats on the assessment.

l) The outcomes from the achievement level setting panel meetings (cut scores, exemplars, and ALDs for use in reporting) shall be forwarded to the Board for their consideration.

Principle 3: Validation and Reporting of Achievement Level Results

The achievement level setting process shall produce results that have appropriate validity evidence for the intended uses and interpretations, are reasonable, and are informative to the public.

Guidelines

a) Professional testing standards define validity as the degree to which evidence supports intended interpretations and uses of test scores. The validity of
achievement level results is a property of their intended interpretations and uses. Standard setting is necessarily judgmental. There are no “true” or “correct” cut scores. Instead, there is a legitimizing process that results in an authoritative consensus. In making a policy judgment to set achievement levels, the Board will examine and consider available evidence about due process and the reasonableness of results, in order to support intended uses and interpretations.

b) NAEP achievement levels are intended to estimate the percentage of students (overall and for selected student groups) in each achievement level category, for the nation, and for states and trial urban districts (TUDAs) for some subjects and grades. NAEP is prohibited by law from reporting any results for individual students or schools, so achievement levels do not apply to individual students or schools.

c) To facilitate valid uses of ALDs for reporting, the Board shall ensure that the descriptions of performance for the achievement levels reflect what the empirical data reveal about the knowledge and skills of students in that score range. The Board shall revisit and may revise content ALDs following the achievement level setting to ensure that they are consistent with empirical evidence of student performance. These revised content ALDs shall be written in terms of what students do know and empirically can do rather than what they should know and should be able to do.

d) The Board will examine and consider all evidence related to reliability and validity of the achievement level setting activities. These data shall include but need not be limited to: procedural evidence such as training, materials and panelist evaluation data; reliability evidence such as consistency across panelist type, subpanels, rounds, and meetings, if appropriate; and external comparisons to other similar assessments, if appropriate, with necessary caveats. The results from validation efforts shall be made available to the Board in a timely manner so that the Board has access to as much validation data as possible as it considers the recommendations regarding the final levels.

e) In describing student performance using the achievement levels, terms such as students performing at the Basic level or students performing at the Proficient level are preferred over Basic students or Proficient students. The former implies that students have mastery of particular content represented by the achievement levels, while the latter implies an inherent characteristic of individual students.

f) In reporting the results of NAEP, the three achievement levels of Basic, Proficient, and Advanced refer to the three regions of the NAEP scale at and above each respective cut score. The remaining region that falls below the Basic cut score will be identified as “below Basic” when a descriptor is necessary.

g) In describing the NAEP Proficient level, reports shall emphasize that the policy definition is not intended to reflect “grade level” performance expectations, which are typically defined normatively and can vary widely by state and over time. Proficient on NAEP may convey a different meaning from other uses of the term.
“proficient” in common terminology or in reference to other assessments.

h) When interpreting student performance using achievement levels, it is important to discourage incorrect comparisons and interpretations. For example, a *Proficient* cut score of 235 in reading should not be interpreted to have the same meaning as a *Proficient* cut score of 235 in U.S. history.

i) An interpretative guide shall accompany NAEP reports, including specific examples of appropriate and inappropriate interpretations and uses of the results.

**Principle 4: Periodic Review of Achievement Levels**

Periodic reviews of existing achievement levels shall determine whether new achievement level descriptions and/or cut scores are needed to continue valid and reliable measurement of student performance.

**Guidelines**

a) At least once every 10 years or 3 administrations of an assessment, whichever comes later, the Governing Board, through its Committee on Standards, Design and Methodology (COSDAM), shall review the alignment between the content ALDs and items, based on empirical data from past and recent administrations of the assessment. In its review, COSDAM (in consultation with ADC) shall solicit input from technical and subject matter experts to determine whether changes to the content ALDs and/or cut scores are warranted, making clear the potential risk of changing cut scores to trends and assessment of educational progress. Relevant factors may include but not be limited to: substantive changes in the item types; changes in the mode of administering assessments; advances in standard setting methodologies; and changes in the policy environment for using NAEP results.

b) Within the period for a review of achievement level descriptions and cut scores, changes may occur to a NAEP framework. If a framework is replaced or revised for a major update, a new achievement level setting process may be implemented automatically, except in circumstances where scale score trends are maintained. In this latter instance, COSDAM will determine how to revise the ALDs and review the cut scores to ensure that they remain appropriate and meaningful.

c) If there are major updates to a NAEP framework, the ALDs will be updated by the Framework Visioning and Development Panel. (See the Governing Board Policy on Framework Development for additional details). Following an assessment administration under the revised framework, COSDAM may decide to use empirical data to revise content ALDs to align with the revised framework.

d) As additional validation evidence becomes available, the Board shall review it and make a determination about whether the achievement levels should be reviewed and potentially redone.
Principle 5: Stakeholder Input

The process of developing student achievement levels is a widely inclusive activity. There are many opportunities to engage multiple stakeholders throughout the achievement level setting process.

Guidelines

a) The content achievement level descriptions are developed through the framework development process, using a panel that represents all major constituents in the various NAEP audiences, as listed in the introduction above. If it is necessary to revise the ALDs for use in achievement level setting and/or reporting, a similar group of content experts will be convened, and public comment will be sought on the resulting achievement level descriptions.

b) The process of seeking nominations for the achievement level setting panels shall include extensive outreach to multiple constituencies, such as: state and local educators; curriculum specialists; business representatives; and professional associations in a given content area.

c) As noted in Principle 2, Guideline a, the Design Document (describing in detail all planned procedures for the project) shall be distributed for review by a broad constituency and shall be disseminated in sufficient time to allow for a thoughtful response from those who wish to provide one. All interested stakeholders shall have an opportunity to provide public comment.

d) As noted in Principle 2, Guideline c, achievement level setting panelists shall include teachers, non-teacher educators, and other interested members of the general public with relevant educational background and experience, including parents, researchers, and employers. Each panel shall reflect diversity in terms of gender, race/ethnicity, region of the country, urbanicity, and experience with students with disabilities and English language learners.

e) As noted in Principle 2, Guideline i, all achievement level setting activities shall be informed by technical advice throughout the process. The Technical Advisory Committee on Standard Setting shall provide ongoing technical input from standard setting and assessment experts, and other groups with relevant technical expertise may be consulted periodically as needed.

f) Ongoing input and coordination with staff and contractors from the NCES will ensure that all achievement level setting activities are carried out in a manner that is consistent with the design, analysis, and reporting of NAEP assessments.

g) The Governing Board may ask its standing groups representing various constituencies to provide input on the achievement level setting process.
Principle 6: Role of the Governing Board

The Governing Board, through its Committee on Standards, Design and Methodology (COSDAM), shall monitor the development and review of student achievement levels to ensure that the final Governing Board-adopted achievement level descriptions, cut scores, and exemplars comply with all principles and guidelines of the Governing Board Student Achievement Levels policy.

Guidelines

a) The Committee on Standards, Design and Methodology (COSDAM) shall be responsible for monitoring the development and review of achievement levels that result in recommendations to the Governing Board for any NAEP assessment under consideration. COSDAM will provide direction to the achievement level setting contractor, via Governing Board staff. This guidance shall ensure compliance with the NAEP legislation, Governing Board policies, Department of Education and government-wide regulations, and requirements of the contract(s) used to implement the achievement level setting project.

b) If there is a need to revise the initial achievement level descriptions (ALDs) created at the time of framework development for use in achievement level setting and/or reporting, the Governing Board shall take final action on revised ALDs.

c) COSDAM shall receive regular reports on the progress of achievement level setting projects.

d) COSDAM shall review and formally approve the Design Document that describes all planned procedures for an achievement level setting project.

e) A COSDAM member may elect to attend any achievement level setting panel meeting(s) as an observer at the discretion of the COSDAM Chair.

f) At the conclusion of the achievement level setting project, the Governing Board shall take final action on the recommended cut scores, exemplars, and ALDs for use in reporting. The Governing Board shall make the final determination on the NAEP achievement levels. In addition to the panel recommendations, the Board may consider other pertinent information to assess reasonableness of the results, such as comparisons to other similar assessments.

g) Following adoption by the Governing Board, the final ALDs, cut scores, and exemplars shall be provided to the National Center for Education Statistics (NCES) for reporting the results of the NAEP assessment(s) under consideration.

h) Consistent with Principle 4 above, COSDAM shall periodically review existing achievement levels to determine whether new achievement level descriptions and/or cut scores are needed to continue valid and reliable measurement of student performance, while recognizing the value of stability and the value that is accrued by using achievement levels over time.
National Assessment Governing Board’s Response to the National Academies of Sciences, Engineering, and Medicine 2016 Evaluation of NAEP Achievement Levels

Legislative Authority

Pursuant to the National Assessment of Educational Progress (NAEP) legislation (Public Law 107-279), the National Assessment Governing Board (hereafter the Governing Board) is pleased to have this opportunity to apprise the Secretary of Education and the Congress of the Governing Board response to the recommendations of the National Academies of Sciences, Engineering, and Medicine evaluation of the NAEP achievement levels for mathematics and reading (Edley & Koenig, 2016).

The cited legislation charges the Governing Board with the authority and responsibility to “develop appropriate student achievement levels for each grade or age in each subject area to be tested.” The legislation also states that “such levels shall be determined by... a national consensus approach; used on a trial basis until the Commissioner for Education Statistics determines, as a result of an evaluation under subsection (f), that such levels are reasonable, valid, and informative to the public; ... [and] shall be updated as appropriate by the National Assessment Governing Board in consultation with the Commissioner for Education Statistics” (Public Law 107-279).

Background

NAEP is the largest nationally representative and continuing assessment of what our nation’s elementary and secondary students know and can do. Since 1969, NAEP has been the country’s foremost resource for measuring student progress and identifying differences in student achievement across student subgroups. In a time of changing state standards and assessments, NAEP serves as a trusted resource for parents, teachers, principals, policymakers, and researchers to compare student achievement across states and select large urban districts. NAEP results allow the nation to understand where more work must be done to improve learning among all students.

For 25 years, the NAEP achievement levels (Basic, Proficient, and Advanced) have been a signature feature of NAEP results. While scale scores provide information about student achievement over time and across student groups, achievement levels reflect the extent to which student performance is “good enough,” in each subject and grade, relative to aspirational goals.
Since the Governing Board began setting standards in the early 1990s, achievement levels have become a standard part of score reporting for many other assessment programs in the US and abroad.

Governing Board Response

Overview

The Governing Board appreciates the thorough, deliberative process undertaken over the past two years by the National Academies of Science, Engineering, and Medicine and the expert members of the Committee on the Evaluation of NAEP Achievement Levels for Mathematics and Reading. The Governing Board is pleased that the report concludes that the achievement levels are a meaningful and important part of NAEP reporting. The report states that, “during their 24 years [the achievement levels] have acquired meaning for NAEP’s various audiences and stakeholders; they serve as stable benchmarks for monitoring achievement trends, and they are widely used to inform public discourse and policy decisions. Users regard them as a regular, permanent feature of the NAEP reports” (Edley & Koenig, 2016; page Sum-8). The Governing Board has reviewed the seven recommendations presented in the report and finds them reasonable and thoughtful. The report will inform the Board’s future efforts to set achievement levels and communicate the meaning of NAEP Basic, Proficient, and Advanced. The recommendations intersect with two Governing Board documents, the Strategic Vision and the achievement levels policy, described here.

On November 18, 2016, the Governing Board adopted a Strategic Vision (https://www.nagb.org/content/nagb/assets/documents/newsroom/press-releases/2016/nagb-strategic-vision.pdf) to guide the work of the Board through 2020, with an emphasis on innovating to enhance NAEP’s form and content and expanding NAEP’s dissemination and use. The Strategic Vision answers the question, “How can NAEP provide information about how our students are doing in the most innovative, informative, and impactful ways?” The Governing Board is pleased that several of the report recommendations are consistent with the Board’s own vision. The Governing Board is committed to measuring the progress of our nation’s students toward their acquisition of academic knowledge, skills, and abilities relevant to this contemporary era.

The Governing Board’s approach to setting achievement levels is articulated in a policy statement, “Developing Student Performance Levels for the National Assessment of Educational Progress” (https://www.nagb.org/content/nagb/assets/documents/policies/developing-student-performance.pdf). The policy was first adopted in 1990 and was subsequently revised in 1995,
with minor wording changes made in 2007. The report motivates the revision of this policy, to add clarity and intentionality to the setting and communication of NAEP achievement levels.

The seven recommendations and the Governing Board response comprise a significant research and outreach trajectory that the Governing Board can pursue over several years in conjunction with key partners. The Governing Board will implement these responses within resource constraints and in conjunction with the priorities of the Strategic Vision.

Evaluating the Alignment of NAEP Achievement Level Descriptors

Recommendation #1: Alignment among the frameworks, the item pools, the achievement-level descriptors, and the cut scores is fundamental to the validity of inferences about student achievement. In 2009, alignment was evaluated for all grades in reading and for grade 12 in mathematics, and changes were made to the achievement-level descriptors, as needed. Similar research is needed to evaluate alignment for the grade 4 and grade 8 mathematics assessments and to revise them as needed to ensure that they represent the knowledge and skills of students at each achievement level. Moreover, additional work to verify alignment for grade 4 reading and grade 12 mathematics is needed.

The report’s primary recommendation is to evaluate the alignment, and revise if needed, the achievement level descriptors for NAEP mathematics and reading assessments in grades 4, 8, and 12. The Governing Board intends to issue a procurement for conducting studies to achieve this goal. The Governing Board has periodically conducted studies to evaluate whether the achievement level descriptors in a given subject should be revised, based on their alignment with the NAEP framework, item pool, and cut scores. The Governing Board agrees that this is a good time to ensure that current NAEP mathematics and reading achievement level descriptors align with the knowledge and skills of students in each achievement level category. In conjunction with the response to Recommendation #3, the updated Board policy on NAEP achievement levels will address the larger issue of specifying a process and timeline for conducting regular recurring reviews of the achievement level descriptions in all subjects and grades.

The Governing Board agrees strongly with the recommendation that, while evaluating alignment of achievement level descriptors is timely, it is not necessary to consider changing the cut scores or beginning a new trend line at this time. The NAEP assessments are transitioning from paper-based to digital assessments in 2017, and current efforts are focused on ensuring comparability between 2015 and 2017 scores. The Governing Board articulated this in the 2015 Resolution on Maintaining NAEP Trends with the Transition to Digital-Based Assessments (https://www.nagb.org/content/nagb/assets/documents/policies/resolution-on-trend-and-dba.pdf).

Recommendation #2: Once satisfactory alignment among the frameworks, the item pools, the achievement-level descriptors, and the cut scores in NAEP mathematics and reading has been
demonstrated, their designation as trial should be discontinued. This work should be completed and the results evaluated as stipulated by law: (20 U.S. Code 9622: National Assessment of Educational Progress: https://www.law.cornell.edu/uscode/text/20/9622 [September 2016]).

Ultimately, the Commissioner of Education Statistics is responsible for determining whether the “trial” designation is removed. The Governing Board is committed to providing the Commissioner with the information needed to make this determination in an expedient manner.

**Regular Recurring Reviews of the Achievement Level Descriptors**

**Recommendation #3:** To maintain the validity and usefulness of achievement levels, there should be regular recurring reviews of the achievement-level descriptors, with updates as needed, to ensure they reflect both the frameworks and the incorporation of those frameworks in NAEP assessments.

The Board’s current policy on NAEP achievement levels contains several principles and guidelines for setting achievement levels but does not address issues related to the continued use or reporting of achievement levels many years after they were established. The revised policy will seek to address this gap by including a statement of periodicity for conducting regular recurring reviews of the achievement level descriptors, with updates as needed, as called for in this recommendation. The Governing Board agrees that it is important to articulate a process and timeline for conducting regular reviews of the achievement level descriptors rather than performing such reviews on an ad hoc basis.

**Relationships Between NAEP Achievement Levels and External Measures**

**Recommendation #4:** Research is needed on the relationships between the NAEP achievement levels and concurrent or future performance on measures external to NAEP. Like the research that led to setting scale scores that represent academic preparedness for college, new research should focus on other measures of future performance, such as being on track for a college-ready high school diploma for 8th-grade students and readiness for middle school for 4th-grade students.

In addition to the extensive work that the Governing Board has conducted at grade 12 to relate NAEP mathematics and reading results to academic preparedness for college, the Governing Board has begun research at grade 8 with statistical linking studies of NAEP mathematics and reading and the ACT Explore assessments in those subjects. This work was published while the evaluation was in process and was not included in the Committee’s deliberations. Additional studies in NAEP mathematics and reading at grades 4 and 8 are beginning under contract to the National Center for Education Statistics (NCES). The Governing Board’s Strategic Vision includes an explicit goal to increase opportunities for connecting NAEP to other national and
international assessments and data. Just as the Board’s previous research related grade 12 NAEP results in mathematics and reading to students’ academic preparedness for college, the Governing Board anticipates that additional linkages with external measures will help connect the NAEP achievement levels and scale scores to other meaningful real-world indicators of current and future performance.

**Interpretations and Uses of NAEP Achievement Levels**

*Recommendation #5: Research is needed to articulate the intended interpretations and uses of the achievement levels and collect validity evidence to support these interpretations and uses. In addition, research to identify the actual interpretations and uses commonly made by NAEP’s various audiences and evaluate the validity of each of them. This information should be communicated to users with clear guidance on substantiated and unsubstantiated interpretations.*

The Governing Board’s Strategic Vision emphasizes improving the use and dissemination of NAEP results, and the Board’s work in this area will include achievement levels. The Governing Board recognizes that clarity and meaning of NAEP achievement levels (and scale scores) are of utmost importance. The Governing Board will issue a procurement to conduct research to better understand how various audiences have used and interpreted NAEP results (including achievement levels). The Governing Board will work collaboratively with NCES to provide further guidance and outreach about appropriate and inappropriate uses of NAEP achievement levels.

**Guidance for Inferences Made with Achievement Levels versus Scale Scores**

*Recommendation #6: Guidance is needed to help users determine inferences that are best made with achievement levels and those best made with scale score statistics. Such guidance should be incorporated in every report that includes achievement levels.*

The Governing Board understands that improper uses of achievement level statistics are widespread in the public domain and extend far beyond the use of NAEP data. Reports by the Governing Board and NCES have modeled appropriate use of NAEP data and will continue to do so. This recommendation is also consistent with the goal of the Strategic Vision to improve the dissemination and use of NAEP results. The Governing Board will continue to work with NCES and follow current research to provide guidance about inferences that are best made with achievement levels and those best made with scale score statistics.
Regular Cycle for Considering Desirability of Conducting a New Standard Setting

Recommendation #7: NAEP should implement a regular cycle for considering the desirability of conducting a new standard setting. Factors to consider include, but are not limited to: substantive changes in the constructs, item types, or frameworks; innovations in the modality for administering assessments; advances in standard setting methodologies; and changes in the policy environment for using NAEP results. These factors should be weighed against the downsides of interrupting the trend data and information.

When the Board’s achievement levels policy was first created and revised in the 1990s, the Board was setting standards in each subject and grade for the first time and had not yet considered the need or timeline for re-setting standards. To address this recommendation, the Governing Board will update the policy to be more explicit about conditions that require a new standard setting.

Board’s Commitment

The Governing Board remains committed to its congressional mandate to set “appropriate student achievement levels” for the National Assessment of Educational Progress. The Board appreciates the report’s affirmation that NAEP achievement levels have been set thoughtfully and carefully, consistent with professional guidelines for standard setting, and based on extensive technical advice from respected psychometricians and measurement specialists. The Board also takes seriously the charge to develop the current achievement levels through a national consensus approach, involving large numbers of knowledgeable teachers, curriculum specialists, business leaders, and members of the general public throughout the process. This is only fitting given the Governing Board’s own congressionally mandated membership that explicitly includes representatives from these stakeholder groups.

The Governing Board remains committed to improving the process of setting and communicating achievement levels. The Governing Board is grateful for the report recommendations that will advance these aims.

Reference

Communication and Interpretation of Achievement Levels

At the May 2018 Governing Board meeting in Montgomery, Alabama, COSDAM will hold a joint meeting with the Reporting and Dissemination Committee (R&D). The purpose of this joint meeting is to discuss the intersection of the two committees’ work on achievement levels for the National Assessment of Educational Progress (NAEP).

Background

From 2014 to 2016, the National Academies of Sciences, Engineering, and Medicine evaluated the NAEP achievement levels in mathematics and reading, which are the responsibility of the Governing Board. In their evaluation, the National Academies noted eight common uses of NAEP achievement levels, specifically:

- Trends or comparisons of successive cohorts, e.g., the percentage of students at or above Proficient in reading has increased over time;
- Comparison to a state assessment;
- Point-in-time comparisons across states, districts, or population groups, e.g., more students in state A who are at or above Proficient in reading compared to state B;
- Rank ordering states or districts;
- Comparison across population groups to examine performance gaps;
- Comparison across subject areas, e.g., more students perform at or above Proficient on mathematics than in reading;
- Comparison of before and after an action or policy implementation; and
- Relationships among achievement results and contextual data.

The evaluation recognized the usefulness and value of the achievement levels but made several important recommendations, most of which focus on the work of COSDAM as well as two that also address the work of the R&D Committee:

RECOMMENDATION 5: Research is needed to articulate the intended interpretations and uses of the achievement levels and collect validity evidence to support these interpretations and uses. In addition, research to identify the actual interpretations and uses commonly made by NAEP’s various audiences and evaluate the validity of each of them. This information should be communicated to users with clear guidance on substantiated and unsubstantiated interpretations.

RECOMMENDATION 6: Guidance is needed to help users determine inferences that are best made with achievement levels and those best made with scale score statistics. Such guidance should be incorporated in every report that includes achievement levels.
Since the release of these recommendations in November 2016, Governing Board staff and COSDAM members have started working to fulfill these recommendations. The draft revision of the Board policy on developing student achievement levels (scheduled for full Board discussion in August 2018 and action in November 2018) establishes an

“interpretative guide [which] shall accompany NAEP reports, including specific examples of appropriate and inappropriate interpretations and uses of the results” (Principle 3i).

COSDAM will develop the content of this interpretative guide, but the responsibility to include and disseminate such a guide in reporting will fall to the R&D Committee and NCES. This joint meeting between R&D and COSDAM will focus, in part, on the development and use of an interpretative guide to facilitate the understanding of achievement levels.

As part of the Governing Board’s contract on Technical Support in Psychometrics, Assessment Development, and Preparedness for Postsecondary Endeavors, the Human Resources Research Organization (HumRRO) is conducting research to understand the various actual uses of NAEP data, including achievement levels. Information taken from published documents and interviews will guide development of a Board policy statement on appropriate uses of NAEP and development of an interpretative guide.

Within this task, HumRRO started work by providing advice on building a validity argument for the NAEP achievement levels. An excerpt of that memo, which focuses on how various audiences use NAEP achievement levels, is attached.

Finally, with the April release of the 2017 Nation’s Report Card in Mathematics and Reading, issues in understanding achievement levels re-emerged. During pre-release briefings with media, a reporter asked how the Proficient level on NAEP differs from what proficient means on a given state assessment. Material presented at the same time as the data release explicates what achievement levels mean (see attached) in hope of avoiding confusion, but misuses still appeared. During this joint meeting, R&D will seek a more concise and more comprehensible way of explaining the achievement levels and of distinguishing them from other uses of the term proficient.

**Guiding Questions**

With this background, the members of both committees will address the following questions in the course of the hour-long discussion:

- Does the revised achievement levels policy (Principle 3 in particular) capture the components critical to communicating the achievement levels effectively?
• How and to whom should an interpretative guide to the inappropriate and appropriate uses of NAEP achievement levels be presented and disseminated? Knowing the intended outcome and audience will inform the content development.

• How should the Governing Board highlight exemplary uses of NAEP achievement levels and address misuses of NAEP achievement levels?

• How can the Governing Board clearly and concisely explain achievement levels accurately? How can these explanations most effectively avoid misinterpretation? How can these explanations cleanly distinguish what NAEP means from what states mean by terms such as Basic and Proficient and Advanced?
Excerpt of Technical Memo: Uses of NAEP Achievement Levels

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Tonya Longabach, Ph.D.
Human Resources Research Organization (HumRRO)

Introduction

The National Assessment Governing Board’s (Governing Board) recent Strategic Vision identifies policymakers, educators, researchers and business leaders, the media, and the general public as stakeholders who are expected to use National Assessment of Educational Progress (NAEP) results. The Strategic Vision is not so specific as to describe how each group is expected to use NAEP results, but it does indicate that they should be informed “about what America’s students know and can do in various subject areas and compare achievement data over time and among student demographic groups.” The Strategic Vision also states that NAEP should “inform education policy and practice.”

The Governing Board is working towards developing a statement of intended and appropriate uses for both scale scores and achievement levels. HumRRO is currently conducting a research study to determine how various audiences have used and interpreted NAEP results. However, the current lack of specificity in the inferences each group might make represents a substantial challenge for validation. We will seek out inferences the identified groups have actually made from NAEP results.

Note that this memorandum is not comprehensive. Our goal is to provide guidance on how NAEP achievement levels might be validated for making specific inferences. The number of potential inferences that might be made and the amount of documentation available to potentially support those inferences is well beyond the scope of this memorandum. The examples we include in this memorandum, while important, do not necessarily represent the most important validation issues or interpretations of NAEP achievement levels rather, they were chosen to be illustrative of the range of inferences. Where possible, we summarize the literature related to common claims, but these summaries do not represent an exhaustive literature review.

Inferences from Various Stakeholders

Policymakers

For purposes of this memorandum, we define policymakers as national and state legislators, board and committee members at the federal, state, and district level who make policy and/or recommendations for policy in education, and other individuals who make or influence educational policy (e.g., congressional staffers, lobbyists). These individuals are responsible for policy across educational institutions and have considerable power to influence curriculum,
instruction, assessment, teacher professional development, and other factors. They must address information regarding what students know and can do, and whether students are prepared for their next experiences, as policymakers strive to improve the state of American education.

Policymakers use NAEP scores and performance level descriptors for the following purposes:

- making comparisons to other districts, states, and the nation;
- making within-state subgroup comparisons;
- analyzing state achievement trends;
- suggesting changes to state assessments and to aid in defining levels of student performance;
- validating state standards and building the case for educational reform and change in their states (Zenisky, Hambleton, & Sireci, 2009); and
- building arguments for new or amended legislation and for requesting funding related to education (Edley & Koenig, 2017).

NAEP is well-structured in many ways for policymakers, who tend to be most interested in aggregate reports of student performance rather than individual student scores. NAEP is designed to generate comparable results across states and demographic groups. NAEP maintains a scale across years and allows for tracking of trends. However, when policymakers use NAEP to justify changes to state assessments or state performance definitions, build a case for educational reforms, or for requesting funding, they must support those uses based on their own understanding of NAEP and their judgements about NAEP’s suitability for those purposes.

**Educators**

For purposes of this memorandum, we define educators as those persons who work most directly with students. They are responsible for instruction and for implementing curriculum and assessments. Educators include teachers, teachers’ support personnel, content area specialists, academic coaches, etc. We also include school principals in this category, although there is some overlap with policymakers, since principals greatly influence policy within their particular schools.

Because NAEP does not produce results for individual students or at the school level, score interpretations are of limited use for educators. The achievement level descriptions (ALDs) and the frameworks, however, may provide considerable useful information. The frameworks indicate the content that students are expected to know in specific subjects at specific grades. The ALDs indicate how students will be categorized based on the level of their knowledge and skill related to that content. The ALDs help educators better understand how student performance is differentiated.

Educators receive their information about NAEP from various sources, including three main NAEP websites. They receive much of their information from their state education agency’s website and the media. NCES also supports a NAEP state coordinator in each state who serves as a liaison between the state department of education and the NAEP programs. They are available to assist in the interpretation of NAEP results. We reviewed a sample of state websites as part of preparing this memorandum. We selected websites to reflect either high or low performance on NAEP to highlight any qualitative differences in the information presented to educators.
The three lowest performing states on NAEP 4th and 8th grade reading and mathematics and the three highest performing states based on 2015 results are shown in Table 1. The state Department of Education (DOE) websites and state education agency websites were searched to determine whether and how the states use NAEP data. We specifically searched for information on using NAEP for standard setting purposes.

Table 1. Highest and Lowest Performing States on 2015 NAEP Reading and Mathematics, Grades 4 and 8

<table>
<thead>
<tr>
<th>Subject/Grade</th>
<th>High Performing</th>
<th>Low Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 4</td>
<td>MA MN NH</td>
<td>AL NM MS</td>
</tr>
<tr>
<td>Grade 8</td>
<td>MA MN NH</td>
<td>AL CA MS</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 4</td>
<td>MA NH VT</td>
<td>NM CA AK MS</td>
</tr>
<tr>
<td>Grade 8</td>
<td>NH MA VT</td>
<td>MS NM LA</td>
</tr>
</tbody>
</table>

There were both differences and similarities in how the low and high performing states referred to the available NAEP data. The low performing states provided much less information about participating in NAEP and the purposes of NAEP, in general, compared to the high performing states. High performing states, on the other hand, were more likely to provide details about student performance and participation on NAEP. Many state DOE websites include links to the state NAEP results on the Nation’s Report Card website. Some state websites made a statement that comparisons can be made of how students from different states performed on NAEP, or reference studies that linked state standards to the NAEP standards. However, both low and high performing states provided little information about the explicit uses of the NAEP data for the purposes of creating state level ALDs and informing the determination of cut scores at the state level.

The websites did not include any explicit reference to whether or how NAEP standards may inform state performance standards, or how NAEP data may serve as impact data in state standard settings. The most explicit statement of the connection between state assessment and NAEP was found on the MA DOE website: “...NAEP has taken on a greater prominence under the No Child Left Behind Act and serves to externally confirm results of state assessments, such as the Massachusetts Comprehensive Assessment System (MCAS)” (National Assessment of Educational Progress Frequently Asked Questions, 2017). The state of Vermont makes another explicit comparison between the structure of its own state science test and the NAEP science assessment standards: “The tests were designed to measure different standards, or frameworks, on separate scoring scales, but both assessments address similar skills and content areas. These assessments provide a way to reference national, state and local science achievement” (Vermont Students Score among Best in the Nation on the National Assessment of Educational Progress, 2016). The state also points out some similarities in the pattern of scores on both the state assessment and NAEP.

Among the state websites studied, most high performing statues reported:

- trends or comparisons of successive cohorts;
- comparison of the percentage of students at or above Proficient on NAEP to the percentage of students at or above Proficient on a state test;
- point-in-time comparisons across states, districts, or population groups (e.g., Vermont included information showing an increase in the performance of students of low SES);
- performance on subscales (e.g. algebra, vocabulary, etc.)
- rank ordering of states or districts;
- comparisons across population groups to examine performance gaps; and
- comparisons across subject areas.

Lower performing states tended to mention NAEP reports less often. However, we did find some information in the comments of school administrators to the media that NAEP results were used as an indication that the current state education system was in need of reform. For example, in 2013 the superintendent of Louisiana, John White, “used the [NAEP state achievement] report to reiterate his push for the Common Core national education standards. ‘The growth this year was moderate. If we want to see something beyond incremental growth, we've got to raise our standards, and the Common Core standards is the best way to do that,’ he said“ (Bacon-Blood, 2013).

**Researchers and Business Leaders**

For purposes of this memorandum, researchers and business leaders include persons conducting educational research and individuals from private industry with an interest in elementary and secondary student performance. Currently, NAEP data use and interpretation research by these stakeholders may take the following directions (Edley & Koenig, 2017):

- track trends in and compare the performance of successive cohorts,
- make point-in-time comparisons across states and school districts,
- compare the performance of population groups within and across states (performance gaps),
- rank order the performance of states and compare state to national performance;
- compare performance across tested subject areas,
- examine relationships among student performance and selected student/school/family variables, and
- compare states’ standards for proficient performance in reading and mathematics by placing them on a common scale defined by NAEP scores (“mapping studies”).

Beginning with NAEP results from 2003, NCES conducted a series of studies that mapped each state’s grade 4 and 8 reading and mathematics proficiency levels to the NAEP scale. This mapping was designed as a mechanism to evaluate the extent to which state standards reflected the same rigor as NAEP standards, and it was used as a policy lever to encourage states to set challenging standards for their students (Edley et al., 2017). In the mapping study report by Bandeira de Mello, Bohrnstedt, Blankenship, & Sherman (2015), the NAEP score that corresponds to a state’s standard (i.e., the NAEP scale equivalent score) is determined by a
direct application of equipercentile mapping. For a given subject and grade, the percentage of students reported in the state assessment to be meeting the standard in each NAEP school is matched to the point on the NAEP achievement scale corresponding to that percentage. The percentage of students passing the state standard was mapped onto the NAEP scores. The results are then aggregated over all of the NAEP schools in a state to provide an estimate of the NAEP scale equivalent of the state’s threshold for its standard (Bandeira de Mello et al., 2015).

Peterson and Ackerman (2015) took a different approach to the comparison of state achievement scores and NAEP scores. They calculated the difference between the percentage of students considered “proficient” by both the state and NAEP assessments. The magnitude of the difference was considered to indicate how rigorous the state standards are as compared with NAEP standards.

These examples indicate that some researchers and policymakers do consider NAEP achievement levels to be a standard that states should strive toward. At the same time, some researchers caution against using NAEP as an infallible measure of state educational achievement due to fundamental differences between the state and NAEP frameworks and standards (e.g., Ho & Haertel, 2007). It is important to remember that determining the score equivalency between NAEP scale and state scale does not say anything about the equivalency or lack thereof in knowledge and skills associated with the score. The NAEP and state assessments may or may not measure the same knowledge and skills. An alignment study would need to be conducted to assess the extent to which the two assessments measured the same construct.

Many studies focused on validity evidence based on relationships with external variables, that is, setting benchmarks on NAEP that are related to concurrent or future performance on measures external to NAEP. Examples are academic preparedness for college; international tests; state tests and their alignment with NAEP (Edley et al., 2017). The studies indicate that there is considerable correspondence between the percentages of students at NAEP achievement levels and the percentages on other assessments (Gattis et al., 2016; Jia et al., 2014; Lim & Sireci, 2017; Neidorf, Binkley, Gattis, & Nohara, 2006; Phillips, 2014a, 2014b; Poland & Plevyak, 2015; Provasnik, Lin, Darling, & Dodson, 2013). These studies show that the NAEP achievement-level results (the percentage of students at the advanced level) are generally consistent with the percentage of U.S. students scoring at the reading and mathematics benchmarks on the Programme for International Student Assessment (PISA), the mathematics benchmarks on Trends in International Mathematics and Science Study (TIMSS), and at the higher levels for College Board Advanced Placement (AP) exams. For example, a report by Fields (2014) states that the content of the 12th grade NAEP reading and mathematics assessments was found to be similar to widely recognized tests used for college admission and placement. A linking study by Moran, Freund, & Oranje (2012) determined that there is a higher correlation between NAEP and SAT mathematics scores than between NAEP and SAT reading scores. The SAT reading benchmark, however, was closer to the NAEP Proficient score than the SAT math benchmark. Several studies investigated the relationship between NAEP Proficient and college and career readiness (Moran, Oranje, & Freund, n.d.; Schneider, Kitmitto, Muhusani, & Zhu, 2015), but the relationship was found to be fairly weak. Additional research in this area was proposed.

During the August 2016 Governing Board quarterly meeting, researchers provided the following recommendations regarding the use of NAEP data.

- Panelists urged the Governing Board to enable linkages from NAEP data to state-level or national-level to conduct research about the long-term effects of educational policies.
• All panelists agreed that while NAEP data describe trends in student achievement, the data do not support conclusions about the reasons for these trends. Additional research is needed to discover factors that can improve schools and student learning.

• It was suggested that the NAEP data be used to compare the performance of districts with similar demographic characteristics, such as poverty levels. NAEP data may be used to guide best practices on what works in the improvement of educational achievement.

**The Media**

While academic and research articles provide scientific, well-reasoned rationales for or against the specific interpretations of NAEP, articles by the media present a different side. They tell the story of those who are trying to use information under real-life conditions from the assessments that the academics are studying, and the real-world challenges and issues experienced by practitioners in the field.

Articles in publications like *Education Week* illustrate that there is a large degree of confusion accompanying the application and interpretation of NAEP standards. While many researchers and even state officials may assume the debate about the application of NAEP standards is resolved, magazine and newspaper articles question whether it is appropriate for states to incorporate NAEP standards into the standards of the state, and what the appropriate uses for NAEP scores are in general.

One point of argument is lack of clarity on the meaning of “proficient” and the application of that meaning to state standards. Not all media representatives consistently clarify for the public that NAEP Proficient is not grade-level proficiency and that NAEP Proficient is intended to be an aspirational standard. What makes this matter more complicated is that under the No Child Left Behind Act (NCLB), states had to create achievement levels that were grade-specific and most states chose to adopt the ALD title of “Proficient.” Reconciling these sets of standards causes additional conflict and confusion when states are trying to create their achievement levels and communicate them to the public. One suggestion to make the situation more understandable is for policymakers to explain to the stakeholders “what are good goals for educational purposes compared to what is appropriate for accountability when establishing cut scores on their state assessments” (Hull, 2008), why they may be different, and which performance levels are more appropriate for each specific purpose.

Many researchers are concerned that information from NAEP gets misinterpreted by the media and politicians, sometimes to serve the interests of specific groups. Various misinterpretations of NAEP results are frequently used by the politicians and media, giving rise to the term “misnaepery” (Sawchuk, 2013). One prominent example of this inappropriate interpretation includes tying an increase in state NAEP scores to some specific policy or intervention implemented by the state, and a decrease – to a policy that was proposed by an organization, but then not implemented. In practice, it is very challenging to make these causal connections. Organizations that are using NAEP scores to bolster claims about the effects of a specific policy are likely not interpreting the NAEP scores correctly (Chingos & Blagg, 2015).

A number of misinterpretations come from the misunderstanding of NAEP’s definition of “proficient”, with some reporters claiming that being below proficient means being “below grade level.” Yet another source of confusion comes from comparing state assessment scores with NAEP scores and arriving at opposing conclusions. Comparing the achievement of different student population groups is often fraught with misinterpretations as well (e.g., treating the
NAEP achievement scale as continuous between grades and comparing achievement of one population at a higher grade to the achievement of another population at a lower grade).

At least in part, these misinterpretations arise from a lack of readily available or accessible information on how the NAEP scores should be interpreted, what the appropriate uses of these scores are, and what conclusions are appropriate to make. Educational researchers call for using caution in deciphering which claims are appropriate, and discouraging the propagation of false claims about NAEP data interpretation (Polikoff, 2015a, 2015b).

**The General Public**

The general public may not have sufficient knowledge and training to deeply understand the intent and the meaning of state or national assessments is, and may have a difficult time interpreting and critically evaluating information coming from various, often conflicting, sources. The media may make the situation in education appear more critical or negative than it really is. For example, if a state performs as one of the best on NAEP, but there is no growth in scores, the general public may see headlines like “Public education test results are dismal. Schools are failing NH children” (Levell, 2016). In addition, as mentioned earlier, the information provided by the media may not be completely objective, and score interpretations may be promoting a specific political agenda.

There is some confusion among the general public regarding why their state may have high scores on the state assessments, but low scores on NAEP (Weiss, 2016; Dillon, 2005). This may occur if the state set standards lower than NAEP standards, or if the state simply has different content standards. There may also be conflicting information on exactly how the state standards compare to NAEP standards; this may cause one study to claim that a state has low standards, and another study – that the state is either lagging behind others, or low on scores from some other perspective. A study by Achieve⁴ describes several NAEP objectives at grade 4 contrasted with the grade those same objectives are introduced in several states’ standards documents. The objective “Use simple ratios to describe problem situations,” is typically introduced in grade 6 in many states. Discrepancies like this add complexity to potential comparisons between NAEP results and state testing results.

One potential goal would be for the general public to be able to use state and national assessments to make decisions about whether children are getting the best education in their particular state. It is likely impossible to make such inferences at the school or even classroom level from state and national assessments. The media, however, may make it sound like those conclusions are appropriate and necessary. The same article by Levell (2016) that proclaimed the failure of New Hampshire public education, for example, suggests that, based on the fact that there was little to no growth in the student scores on state assessments or NAEP, the parents should “[e]ngage your local school board and question why they are using College and Career Readiness Standards and tests that are not providing a better education for our children;” consider a transfer to a charter or private school; or refuse to have their child take a state assessment. It may be helpful for the general public to have access to a source of clear, easy to understand, reliable information on the kinds of inferences that can legitimately be made from state and national assessments.

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References


Every two years, the National Assessment of Educational Progress (NAEP) in reading and mathematics is administered and results are reported. The results are presented for the nation, for states and jurisdictions like the District of Columbia, and for 27 select urban school districts. The Nation's Report Card, as NAEP is known, provides more than just average scores, so that student performance can be understood more fully. Results can be examined by characteristics of schools, teachers, and students, such as urbanicity, teacher certification, and student demographics.

The National Assessment Governing Board was created by Congress in 1988 as an independent, nonpartisan board to set policy for NAEP. The Governing Board’s duties include determining what subjects are assessed when and developing student achievement levels for NAEP. Achievement levels represent what students should know and be able to do, essentially answering the question: How good is good enough on NAEP?

The Governing Board defines the meaning of the achievement levels of Basic, Proficient, and Advanced through a careful and deliberate process. Achievement-level setting, also called standard setting, is not unique to NAEP or to educational testing. Medical boards and state bar organizations use cut scores to determine who may practice in their respective professions. More broadly, athletic competitions may set cut scores for what skills need to be demonstrated before moving to the next round. For The Nation's Report Card, the process translates content expectations to the NAEP scale, producing cut scores that separate each category of performance.
NAEP standard-setting involves approximately 20 to 30 content experts, typically teachers and other subject-matter experts, who meet for several days and receive in-depth training. Standard-setting experts provide technical guidance throughout the process and the content experts apply their knowledge and experience to recommend the achievement levels. Panelists also recommend exemplars—items or student responses that are representative examples of performance at the Basic, Proficient, and Advanced levels. Achievement Level Descriptions, specific to each assessment, accompany the recommendations to clarify what Proficient means, for example, on the NAEP grade 4 mathematics assessment.

NAEP defines Proficient differently from other uses of the term. For example, the Every Student Succeeds Act refers to student “proficiency.” State assessment systems may use the terms “proficient” and “proficiency,” but there is wide variation in how states define proficient, e.g., equivalent to grade-level performance or a description of what students already know. This variation in terminology is often a source of confusion when it comes to understanding the NAEP achievement levels. For NAEP, Proficient represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real world situations, and analytical skills appropriate to the subject matter. Thus, Proficient represents an aspirational goal for what all students should know.

The National Assessment Governing Board is responsible for setting achievement levels based on the outcome of the standard-setting process. The Board has set achievement levels in nine NAEP subjects and always solicits public comment on the plans for the standard-setting process and on the content of the Achievement Level Descriptions. The Nation's Report Card includes information about the types of items or responses that exemplify each achievement level, which helps to illustrate what performance at each achievement level looks like.

The Governing Board has set achievement levels in these nine NAEP subjects:

- math
- reading
- writing
- civics
- economics
- geography
- science
- technology and engineering literacy
- U.S. history

By presenting both average scores and achievement levels, the National Assessment Governing Board fulfills its Congressionally mandated obligation to improve the reporting of results on The Nation's Report Card. For more information, please visit the Governing Board's website: www.nagb.gov.
Strategic Vision Activities Led by COSDAM

During the November 2016 Board meeting, a Strategic Vision was formally adopted to guide the Board’s work over the next several years. For each activity led by COSDAM, information is provided below to describe the current status and recent work, planned next steps, and the ultimate desired outcomes. Please note that many of the Strategic Vision activities require collaboration across committees and with NCES, but the specific opportunities for collaboration are not explicitly referenced in the table below. In addition, the activities that include contributions from COSDAM but are primarily assigned to another standing committee (e.g., framework update processes) or ad hoc committee (i.e., exploring new approaches to postsecondary preparedness) also have not been included below.

The Governing Board’s Assistant Director for Psychometrics, Sharyn Rosenberg, will answer any questions that COSDAM members have about ongoing or planned activities.

<table>
<thead>
<tr>
<th>Strategic Vision Activity</th>
<th>Current Status and Recent Work</th>
<th>Planned Next Steps</th>
<th>Desired Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV #2: Increase opportunities to connect NAEP to administrative data and state, national, and international student assessments</td>
<td><em>Incorporate ongoing linking studies to external measures of current and future achievement in order to evaluate the NAEP scale and add meaning to the NAEP achievement levels in reporting. Consider how additional work could be pursued across multiple subject areas, grades, national and international assessments, and longitudinal outcomes.</em>&lt;br&gt;  COSDAM discussions at May and August 2017 board meetings to examine how existing findings may be used to add meaning to scale scores and achievement levels, and what additional studies to take on&lt;br&gt;  Ongoing linking studies include: national NAEP-ACT linking study; longitudinal studies at grade 12 in MA, MI, TN; longitudinal studies at grade 8 in NC, TN; NAEP-TIMSS linking study; NAEP-HSLS linking study; NAEP Validity Studies (NVS) studies&lt;br&gt;  Informational update on current studies was provided in the March 2018 COSDAM materials</td>
<td>Complete ongoing studies&lt;br&gt;  Decide what new studies to take on&lt;br&gt;  Decide how to use and report existing and future results&lt;br&gt;  Complete additional studies</td>
<td>NAEP scale scores and achievement levels may be reported and are better understood in terms of how they relate to other important indicators of interest (i.e., other assessments and milestones)</td>
</tr>
<tr>
<td>Strategic Vision Activity</td>
<td>Current Status and Recent Work</td>
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<td>Desired Outcome</td>
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<tr>
<td>SV #3: Expand the availability, utility, and use of NAEP resources, in part by creating new resources to inform education policy and practice</td>
<td>Ina Mullis of the NVS panel spoke with COSDAM at the March 2017 board meeting and is working on a white paper about the history and uses of NAEP. Technical Support contract specifies that the research study topic for year 1 will focus on how NAEP results are used by various stakeholders. The study is currently underway and is planned for COSDAM discussion during the August 2018 Board meeting.</td>
<td>Use research to draft short document of intended and appropriate uses for Board discussion (November 2018)</td>
<td>Board adopts formal statement or policy about intended uses of NAEP. The goal is to increase appropriate uses and decrease inappropriate uses (in conjunction with dissemination activities to promote awareness of the policy statement)</td>
</tr>
<tr>
<td>Research when and how NAEP results are currently used (both appropriately and inappropriately) by researchers, think tanks, and local, state and national education leaders, policymakers, business leaders, and others, with the intent to support the appropriate use of NAEP results (COSDAM with R&amp;D and ADC)</td>
<td>This idea was generated during the August 2017 COSDAM discussion of the Strategic Vision activities</td>
<td>NCES produces documentation of validity evidence for intended uses of NAEP scale scores</td>
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<tr>
<td>Develop a statement of the intended and unintended uses of NAEP data using an anticipated NAEP Validity Studies Panel (NVS) paper and the Governing Board’s research as a resource (COSDAM with NCES)</td>
<td></td>
<td>Governing Board produces documentation of validity evidence for intended uses of NAEP achievement levels</td>
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<tr>
<td>Disseminate information on technical best practices and NAEP methodologies, such as training item writers and setting achievement levels</td>
<td></td>
<td>Work with NCES and R&amp;D to refine list of technical topics for dissemination efforts</td>
<td>Stakeholders benefit from NAEP technical expertise</td>
</tr>
<tr>
<td>Strategic Vision Activity</td>
<td>Current Status and Recent Work</td>
<td>Planned Next Steps</td>
<td>Desired Outcome</td>
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<tr>
<td>SV# 5: Develop new approaches to update NAEP subject area frameworks to support the Board’s responsibility to measure evolving expectations for students, while maintaining rigorous methods that support reporting student achievement trends</td>
<td>Panel of standard setting experts convened in January 2018 to discuss technical issues and recommendations for achievement levels policy</td>
<td>COSDAM discussion of draft revised policy statement to occur at this Board meeting (May 2018)</td>
<td>Board has updated policy on achievement levels that meets current best practices in standard setting and is useful for guiding the Board’s achievement levels setting work</td>
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<td></td>
<td>Literature review on considerations for creating and updating achievement level descriptors (ALDs)</td>
<td>COSDAM call to discuss revised draft policy (June 2018)</td>
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<td></td>
<td>Technical Memo on developing a validity argument for the NAEP achievement levels (February 2018)</td>
<td>Revised policy statement for full Board discussion (August 2018)</td>
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<td></td>
<td>The efforts described above were discussed at the March 2018 COSDAM meeting</td>
<td>Full Board call to discuss revised draft policy (October 2018)</td>
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<td>Board action on revised policy statement (November 2018)</td>
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<tr>
<td>SV# 7: Research policy and technical implications related to the future of NAEP Long-Term Trend assessments in reading and mathematics</td>
<td>White papers commissioned, symposium held in Washington, DC (March 2017), and follow-up event held at American Educational Research Association (AERA) annual conference (April 2017)</td>
<td>Per the discussion and next steps at the March 2018 Executive Committee meeting, COSDAM will discuss design considerations for the next administration of LTT. Additional information is expected to be provided by NCES at the August COSDAM meeting.</td>
<td>Determine whether changes to the NAEP LTT schedule, design and administration are needed (led by Executive Committee and NCES)</td>
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<td></td>
<td>Full Board and Executive Committee discussions (March, May, and August 2017) and webinar on secure LTT items and p-values from 2012 administration (October 2017)</td>
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<tr>
<td>Strategic Vision Activity</td>
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<tr>
<td>SV# 9: Develop policy approaches to revise the NAEP assessment subjects and schedule based on the nation’s evolving needs, the Board’s priorities, and NAEP funding</td>
<td>Pending outcomes of stakeholder input (ADC activity), evaluate the technical implications of combining assessments, including the impact on scaling and trends</td>
<td>Plenary discussion of Assessment Schedule during May 2018 Board meeting</td>
<td>Determine whether new assessment schedule should include any consolidated frameworks or coordinated administrations</td>
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<td></td>
<td>COSDAM presentation and discussion on initial considerations for combining assessments (November 2017)</td>
<td>Additional discussion planned for August 2018, with Board action tentatively scheduled for November 2018</td>
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<td></td>
<td>Full Board presentation and discussion on efficiencies in what and how to measure student knowledge and skills (March 2018)</td>
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<tr>
<td>SV# 10: Develop new approaches to measure the complex skills required for transition to postsecondary education and career</td>
<td>Several studies are ongoing (see activities under SV# 2)</td>
<td>Decide whether additional research should be pursued at grade 8 to learn more about the percentage of students “on track” to being academically prepared for college by the end of high school</td>
<td>Statements about using NAEP as an indicator of academic preparedness for college continue to be defensible and to have appropriate validity evidence</td>
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<td></td>
<td>Per COSDAM discussion at August 2017 meeting, additional studies are on hold until at least November 2018 pending Board decision on how to move forward with findings from Ad hoc Committee on Measures of Postsecondary Preparedness</td>
<td>Decide whether Board should make stronger statement and/or set “benchmarks” rather than current approach of “plausible estimates”</td>
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<td></td>
<td></td>
<td>Decide whether additional research should be conducted with more recent administrations of NAEP and other tests</td>
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National Assessment Governing Board
Reporting and Dissemination Committee

Friday, May 18, 2018
10:30 am – 1:00 pm

AGENDA

10:30 – 10:35 am Welcome
Rebecca Gagnon, Chair

10:35 – 11:00 am Review of 2017 NAEP Reading and Math Release (SV #4)
Stephaan Harris, Assistant Director for Communications

11:00 – 11:30 am Review of 2019 Core Contextual Variables (SV #6)
James Deaton, National Center for Education Statistics

11:30 – 11:50 am Considerations for Long-Term Trend
Rebecca Gagnon

11:50 am – 12:00 pm Break and Transition to Joint Committee Meeting

12:00 – 1:00 pm Joint Meeting with COSDAM
Communication and Interpretation of Achievement Levels (SV #3)
Rebecca Gagnon
Andrew Ho, Chair, COSDAM
<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Action</th>
<th>Measurable Outcomes</th>
<th>Start Date</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inform #1: Strengthen and expand partnerships by broadening stakeholders’ awareness of NAEP and facilitating their use of NAEP resources</strong></td>
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</tr>
<tr>
<td>1.</td>
<td>Develop and Sustain Partnerships // Identify What Partners Need to Expand Use and Utility of NAEP</td>
<td>Board staff</td>
<td>Meet with ongoing and new partners</td>
<td>Increased number of partners and meetings</td>
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<td>Board staff; Communications contractor</td>
<td>Send newsletters to partners</td>
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<td></td>
<td>Communications contractor – Client Relationship Management tool (CRM)</td>
<td>Audit and maintain database of contacts</td>
</tr>
<tr>
<td>2.</td>
<td>Work with Partners to Increase Awareness and Use of NAEP</td>
<td>Board members; Board staff; NCES staff; Communications contractor</td>
<td>Submit proposals to annual meetings</td>
<td>Increased representation at events/meetings; Increased number of conference presentations</td>
</tr>
<tr>
<td>3.</td>
<td>Focused Reporting of NAEP Results</td>
<td>Board staff; CRP contractor; Communications contractor</td>
<td>Four tasks that will produce content to disseminate through partners</td>
<td>Increased traffic to website and social media; Views of artifacts; Numbers of posts and re-posts</td>
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</tbody>
</table>
### Strategic Vision – Activities for Reporting and Dissemination Committee

<table>
<thead>
<tr>
<th>Responsibility</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Board staff; Communications contractor</td>
<td>Produce quick graphics, videos, artifacts for dissemination</td>
<td>Traffic to webpage; Views of artifacts; Number of posts and re-posts</td>
<td>January 2018</td>
<td>Graphics and products based on 2017 data underway</td>
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</tbody>
</table>

4. **Highlight Contextual Data in Reporting**

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Action</th>
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<th>Start Date</th>
<th>Current Status</th>
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</thead>
<tbody>
<tr>
<td>Board members; Board staff; NCES staff; Communications contractor</td>
<td>Review contextual data for messaging / dissemination, including new indicators; Use contextual data in graphics, videos, toolkits</td>
<td>Increased number of artifacts with contextual data; Increased number of partners posting and re-posting artifacts; Traffic to social media posts with NAEP contextual data</td>
<td>Ongoing</td>
<td>Nation’s Report Card release in April 2018 included new contextual indices; Follow-up artifacts will focus on new indices</td>
</tr>
</tbody>
</table>

**Inform #2: Increase opportunities to connect NAEP to administrative data and state, national, and international student assessments**

5. **Identify Opportunities to Promote Use of NAEP Data with Federal Datasets**

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Action</th>
<th>Measurable Outcomes</th>
<th>Start Date</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board members; Board staff; NCES staff</td>
<td>Determine what data would be feasible, useful, and of similar quality to NAEP to promote</td>
<td>Launch site with NAEP results and connections to other data; Traffic to website</td>
<td>September 2017</td>
<td>Learned about NAEP High School Transcript Study at March 2018 meeting</td>
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<tr>
<th>Responsibility</th>
<th>Action</th>
<th>Measurable Outcomes</th>
<th>Start Date</th>
<th>Current Status</th>
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<tbody>
<tr>
<td>Board members; Board staff; NCES staff</td>
<td>Collaborate with COSDAM about connecting NAEP with other data</td>
<td>Joint meeting of COSDAM and R&amp;D to develop decisions to present to Board</td>
<td>2018</td>
<td>TBD</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Action</td>
<td>Measurable Outcomes</td>
<td>Start Date</td>
<td>Current Status</td>
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<tr>
<td>6. Learn from Reporting of International Assessments (<em>Also, SV #8</em>)</td>
<td>Board members; Board staff; NCES staff; Communications contractor</td>
<td>Learn about international assessments</td>
<td></td>
<td>November 2017 Board meeting</td>
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<td></td>
<td>Board members; Board staff; NCES staff</td>
<td>Invite OECD staff to present on reporting approaches</td>
<td>Discussions about what practices to apply to NAEP</td>
<td>March 2018 (?) Future R&amp;D meeting focused on international reporting</td>
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<td></td>
<td>Meet with NCES staff to consider crossover of reporting approaches</td>
<td>Board meeting plenary session re: feasible options; Possible incorporation of elements of international work in 2019 Nation’s Report Card</td>
<td>Spring 2018</td>
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<tr>
<td>#</td>
<td>Activity</td>
<td>Responsible Parties</td>
<td>Description</td>
<td>Target Date</td>
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<tr>
<td>7.</td>
<td>Add Meaning to NAEP Achievement Levels</td>
<td>Technical support contract with HumRRO (COSDAM lead)</td>
<td>Use findings from HumRRO study to develop guides</td>
<td>October 2017</td>
</tr>
<tr>
<td>8.</td>
<td>Research Effective Uses of NAEP</td>
<td>Technical contract with HumRRO;</td>
<td>Learn where and how NAEP is used effectively</td>
<td>October 2017</td>
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<td></td>
<td></td>
<td>Communications contractor</td>
<td>Develop graphics and/or videos to support correct interpretation of NAEP results</td>
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<td>9.</td>
<td>Develop New Tools for Audiences</td>
<td>Board members; Board staff; NCES staff; Communications contractor</td>
<td>Ideas for tailored reports shared with NCES</td>
<td>August 2016</td>
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<td></td>
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<td>Uses of new tool on website post-release; User feedback</td>
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<td></td>
<td>Board members; Board staff; NCES staff; Communications contractor</td>
<td>Construct custom portals for different subjects and/or types of users</td>
<td>Uses of portals; User feedback</td>
<td>January 2019</td>
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<tr>
<td>10.</td>
<td>Identify More User-Friendly Approaches to Presenting NAEP Results</td>
<td>Board staff</td>
<td>Invite partners / stakeholders to Board meetings to share needs, interests for using NAEP data</td>
<td>Number of plenary and R&amp;D sessions; Posts of panel summaries; Traffic to social media posts of summaries</td>
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<tr>
<td></td>
<td></td>
<td>Board members; Board staff; Communications contractor</td>
<td>Create “menu of engagement” list of speakers, graphics, videos, artifacts that Board staff can offer partners</td>
<td>Artifacts developed for and posted by partners; Number of requests by partners; Number of activities</td>
</tr>
<tr>
<td>11.</td>
<td>Create “Brief Case” Studies</td>
<td>Board staff; Communications contractor</td>
<td>Learn how NAEP used effectively by states and districts to serve as guide via compelling narratives in graphics, videos, two-pagers</td>
<td>Increased social media traffic; Number of “brief case studies” posted and re-posted</td>
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<td>Tennessee case study underway by Hatcher Group</td>
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<td>12.</td>
<td>Facilitate Teacher Preparation Program Toolkit to Increase Access and Use of NAEP by Teachers</td>
<td>Board staff; Communications contractor</td>
<td>Meet with teacher educators to learn needs and interests</td>
<td>Develop tools and resources; Use of toolkits; User feedback</td>
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<tr>
<td></td>
<td>Communications contractor</td>
<td>Support development of toolkit by partners</td>
<td>Webpage on Governing Board website for teacher educators and preservice teachers</td>
<td>January 2019</td>
</tr>
</tbody>
</table>

**Inform #4:** Promote sustained dissemination and use of NAEP information beyond Report Card releases with consideration for multiple audiences and ever-changing multi-media technologies.

*Note: SV #4 permeates throughout the entire list of planned tasks and activities, so is not presented in separate rows.*

**Innovate #6:** Continue improving the content, analysis, and reporting of NAEP contextual data by considering the questions’ relevance, sensitivity, and potential to provide meaningful context and insights for policy and practice

<table>
<thead>
<tr>
<th>13.</th>
<th>Review Contextual Variables</th>
<th>Board members; Board staff</th>
<th>Review contextual variables to ensure relevance and importance</th>
<th>Greater use of contextual data; Updated variables</th>
<th>Ongoing</th>
<th>Participated in April 2018 Questionnaire Standing Committee re: contextual data; Reviewing core contextual items at May 2018 R&amp;D meeting</th>
</tr>
</thead>
</table>
Focused Reporting of Data from the National Assessment of Educational Progress (NAEP):
Project Update

The two-year Focused Reporting project addresses topics on which NAEP collects data, but which do not receive much exposure in report cards or secondary reports. Three topics constitute the scope of the project:

- Rural education
- Large urban districts that participate in the NAEP Trial Urban District Assessment (TUDA)
- Inclusion of English language learners and students with disabilities in NAEP

The end products will incorporate engaging video and graphical elements that will appear on the Governing Board website and on various social media with the intent to inspire others to use these data. Equally important, the end products will provide insights on these topics as well as show the tremendous range of information about students, teachers, and schools that is collected with each NAEP assessment.

The first product was a video on aspects of education in rural areas. Posted on the Governing Board’s website in November 2017, the video and short excerpts suitable for social media received wide circulation. For example:

- 203 views of the full rural video on NAGB’s YouTube channel, plus 90 views of the three excerpts;
- Posting of the full video by Change the Equation and MIND Research;
- Posting of the parent-teacher conference excerpt by the National PTA, stimulating 198 views, six retweets, and four likes; and
- Tweets of the excerpt about the most improved rural states to several states, resulting in 431 views, nine retweets, and six likes.

Currently, the project is focusing on education in large urban school districts. This report, due in June 2018, will concentrate on less well-known information about the TUDA districts that NAEP collects in its survey questionnaires. The contractor, CRP, Inc., and their subcontractor, Mind & Media, are designing a web page that summarizes 2017 data on achievement and actionable factors in large cities and in the various TUDA districts. Several “memes,” short engaging visuals highlighting specific characteristics amenable to posting on social media sites, will also be produced. These products should attract the interest of the 27 urban school districts in the TUDA program as well as stakeholders who focus on urban education.
Work on the final topic—implementation of the Governing Board’s policy on inclusion of students with disabilities and English language learners—is also underway. The report, which will be presented in a graphic, will briefly review the history of inclusion in the NAEP program and the progress the program has made in the nation and the states, especially since the adoption of the inclusion policy in 2010, as updated in 2014. The report will highlight the role of this policy in encouraging states to meet inclusion guidelines. Completion of this phase is scheduled for late summer 2018.
Upcoming NAEP Reports as of May 2018

**Initial NAEP Releases**

<table>
<thead>
<tr>
<th>Report Title</th>
<th>Release Date</th>
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<tbody>
<tr>
<td>Mapping State Proficiency Standards onto the NAEP Scales: Results from the 2015 NAEP Reading and Mathematics Assessments</td>
<td>May 2018</td>
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**Other NAEP Reports**

<table>
<thead>
<tr>
<th>Report Title</th>
<th>Release Date</th>
</tr>
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<tbody>
<tr>
<td>2015 Student Questionnaires: Student Views</td>
<td>May 2018</td>
</tr>
<tr>
<td>2015 Student Questionnaires: Computer Access and Usage in Mathematics and Reading</td>
<td>June 2018</td>
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<tr>
<td>2015 National Indian Education Study: A Closer Look</td>
<td>June 2018</td>
</tr>
<tr>
<td>Paths Through Mathematics and Science: Patterns and Relationships in High School Course Taking</td>
<td>June 2018</td>
</tr>
<tr>
<td>2015 Student Questionnaires: Classroom Instruction for Mathematics Reading and Science</td>
<td>July 2018</td>
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</tbody>
</table>
DEBRIEF REPORT SUMMARY: 2017 NAEP READING AND MATHEMATICS RELEASES

Held April 10 at the National Press Club in Washington, D.C., NAEP Day featured the release of the national and state 2017 mathematics and reading results in the morning and the Trial Urban District Assessment results in the afternoon.

OUTREACH AND ATTENDANCE

We are pleased with the RSVP and attendance of both the live and online audiences, which reached or surpassed live and online audiences for previous NAEP releases. More than 240 people registered for the morning and afternoon NAEP Day events; the 175 attendees at the morning event and nearly 100 at the afternoon event reflected a relatively low attrition rate compared with RSVPs.

There was a large online audience: 710 people registered through the webcast service, yielding 653 unique viewers with between 200-440 streams active at any given time (this could include more than one viewer). This chart shows livestream traffic during the events. During the live streams, we received 33 questions from online viewers.

The combined outreach strategies included four weekly invitations and individual outreach to executive-level leaders of education organizations. The short videos by Board members and additional social media push also helped increase participation; 72 registrations came directly from social media.
SOCIAL CONVERSATION

In the two months before NAEP Day, the conversation around NAEP and the impending release reached 25 million impressions from more than 2,500 tweets from 1,558 contributors. Much of this was driven by the Fordham Institute, which released five blog posts and tweeted almost 150 times between Michael Petrilli’s and Education Gadfly’s accounts.

The Governing Board sent 115 tweets and 22 Facebook posts, and created toolkits for partners and Governing Board members. We created several short videos that were viewed almost 3,000 times, greatly aiding these efforts.

NAEP Day saw a huge surge in interest, driven by live-tweeting and the far-reaching media coverage. Nearly 3,000 people tweeted more than 5,000 times, causing #NAEPDay to trend in Washington and #NAEP to trend nationally. As of Tues., April 24, each day since NAEP Day has seen more than 100 people tweet about NAEP. More impressions (76 million) have been driven since NAEP Day than on the day of the actual event (60 million). The conversation has continued.

The Atlantic article on the reading panel, “Why American Students Haven’t Gotten Better at Reading in 20 Years,” has been shared in 2,500 tweets and received more than 50,000 Facebook engagements.

LOGISTICAL COORDINATION

The National Press Club proved to be an excellent venue for these events. It provided gravitas and excellent space and execution by the Press Club staff. Having the two additional wings for a green room and space for participants to gather during the presentations also worked well. The additional support of Rock Creek to serve as our team’s on-site producer was also invaluable. The stage set-up, NAGB banners, podium sign, etc., looked great and provided a polished, professional tone for the event.

PROGRAM

The caliber of speakers was excellent, and Tonya Matthews did a masterful job as emcee. The following reflects Hatcher’s observations and feedback we heard or received directly during or after the event.

- The NCES morning presentation was concise and well received, especially the “bee hive” graphic, but it could have included more state data. The afternoon presentations by NCES and Michael Casserly had some overlap.
- Terry Holliday was a good moderator; posed questions and stepped back to allow sharing by state superintendents. Some asked why those specific states were selected; could clarify in future events.
- Reading panel’s focus was a smart choice that worked incredibly well. The panelists covered potential reasons behind flat reading scores, offered solutions, and provided varying perspectives.
- The TUDA superintendents were “rock stars,” communicating in an engaging, precise way about their districts. Alberto Carvalho moderated a thoughtful Q&A session. The intro videos set a lively tone for the session.

Looking ahead, we recommend giving moderators even more guidance, particularly with 30-minute panels. This timeframe keeps the audience engaged, but requires moderators to keep introductions short, speakers on point, and ask clarifying questions. The moderator must keep the conversation flowing so that it balanced and does not feel rushed.
PARTNERSHIP PARTICIPATION
One of the Governing Board’s strategic priorities is to deepen partnerships. From a communications perspective, a great way to do that is to supply social media “toolkits,” with easily sharable content. We tried this strategy by providing an outreach toolkit for partners to promote the event and a “watch party” toolkit for the TUDA districts.

We saw uptake from several Governing Board members to help publicize NAEP Day. And a couple of school districts—Austin and Miami-Dade—had watch parties and posted photos on Twitter that we could show during the event.

Going forward, we think this strategy has much more potential and look forward to conversations about how to better leverage partner interest.
On Friday, May 18 the Reporting & Dissemination (R&D) Committee will review proposed changes to the core contextual questions. In support of this activity, NCES will prepare an electronic review package for R&D members. This review package will be structured the same as in recent years and will be sent electronically to the Committee by COB Wednesday, May 2. Similar to last year, this review will encompass approximately 20 questions or fewer.

The May 2018 electronic review package will include 2019 operational and 2021 pilot questions, specifically:

- Revised “Perseverance” and “Enjoyment of Complex Thinking” questions. These items were revised to say “describe you” instead of “describe a person like you” to increase clarity and ensure consistency with similar subject-specific noncognitive questions.
- Revised post-secondary question for grade 12 students. This item was slightly revised to a yes/no matrix format instead of a “Select all that apply” multiple choice question to improve data interpretation (i.e., distinguish non-response from ‘not applicable’).
- Added art-related question for grades 8 and 12, based on a previously administered NAEP Arts assessment item. We include this question based on R&D feedback about the importance of capturing this information in years when the NAEP Arts assessment is not administered.
- Revised student technology questions to improve clarity.
- Added school climate questions to create more thorough coverage of this multidimensional construct.
- Added new postsecondary preparation on grade 12 student survey and new exposure to arts/music/language to grades 8 and 12 student surveys.
- Revised teacher education and professional experience teacher questions. The teacher education question was slightly revised to be more inclusive, and the professional experience question was revised with more “up-to-date” technology language.
- Added new school questions pertaining to enrollment criteria for school admission and charter school characteristics given increased stakeholder interest.

After this review occurs, please send comments to Laura by COB Wednesday, May 23.
Figure 1 (see figure below) provides a high-level overview of the 2019 operational and 2021 pilot development timeline. Please note the majority of 2019 operational items are trend questions, and most of the revised and new questions are intended for pilot testing.

Figure 1. High-Level Overview of 2019 and 2021 Core Survey Questionnaires Development Timeline.

= Governing Board Review
Joint Meeting with Committee on Standards, Design and Methodology on Achievement Levels

At the May 2018 Governing Board meeting in Montgomery, Alabama, the Reporting and Dissemination Committee will hold a joint meeting with the Committee on Standards, Design and Methodology (COSDAM). The purpose of this joint meeting is to discuss the intersection of the two committees’ work on achievement levels for the National Assessment of Educational Progress (NAEP).

**Background**

From 2014 to 2016, the National Academies of Sciences, Engineering, and Medicine evaluated the NAEP achievement levels in mathematics and reading, which are the responsibility of the Governing Board. In their evaluation, the National Academies noted eight common uses of NAEP achievement levels, specifically:

- Trends or comparisons of successive cohorts, e.g., the percentage of students at or above Proficient in reading has increased over time;
- Comparison to a state assessment;
- Point-in-time comparisons across states, districts, or population groups, e.g., more students in state A who are at or above Proficient in reading compared to state B;
- Rank ordering states or districts;
- Comparison across population groups to examine performance gaps;
- Comparison across subject areas, e.g., more students perform at or above Proficient on mathematics than in reading;
- Comparison of before and after an action or policy implementation; and
- Relationships among achievement results and contextual data.

The evaluation recognized the usefulness and value of the achievement levels but made several important recommendations, most of which focus on the work of COSDAM as well as two that also address the work of the Reporting and Dissemination (R&D) Committee:

**RECOMMENDATION 5:** Research is needed to articulate the intended interpretations and uses of the achievement levels and collect validity evidence to support these interpretations and uses. In addition, research to identify the actual interpretations and uses commonly made by NAEP’s various audiences and evaluate the validity of each of them. This information should be communicated to users with clear guidance on substantiated and unsubstantiated interpretations.
RECOMMENDATION 6: Guidance is needed to help users determine inferences that are best made with achievement levels and those best made with scale score statistics. Such guidance should be incorporated in every report that includes achievement levels.

Since the release of these recommendations in November 2016, COSDAM members and Governing Board staff have worked to fulfill these recommendations. The draft revision of the Board policy on developing student achievement levels (scheduled for full Board discussion in August 2018 and action in November 2018) establishes an

“interpretative guide [which] shall accompany NAEP reports, including specific examples of appropriate and inappropriate interpretations and uses of the results” (Principle 3i).

COSDAM will develop the content of this interpretative guide, but the responsibility to include and disseminate such a guide in reporting will fall to the R&D Committee and NCES. This joint meeting between R&D and COSDAM will focus, in part, on the development and use of an interpretative guide to facilitate the understanding of achievement levels.

As part of the Governing Board’s contract on Technical Support in Psychometrics, Assessment Development, and Preparedness for Postsecondary Endeavors, the Human Resources Research Organization (HumRRO) is conducting research to understand the various actual uses of NAEP data, including achievement levels. Information taken from published documents and interviews will guide development of a Board policy statement on appropriate uses of NAEP and development of an interpretative guide.

Within this task, HumRRO started work by providing advice on building a validity argument for the NAEP achievement levels. An excerpt of that memo, which focuses on how various audiences use NAEP achievement levels, is included with this cover material.

Finally, with the April release of the 2017 Nation’s Report Card in Mathematics and Reading, issues in understanding achievement levels re-emerged. During pre-release briefings with media, a reporter asked how the Proficient level on NAEP differs from what proficient means on a given state assessment. Material presented at the same time as the data release explicated what achievement levels mean in hopes of avoiding confusion, but misuses still appeared. During this joint meeting, R&D will seek a more concise and more comprehensible way of explaining the achievement levels and of distinguishing them from other uses of the term proficient.
**Guiding Questions**

With this background, the members of both committees will address the following questions in the course of the hour-long discussion:

- Does the revised achievement levels policy (Principle 3 in particular) capture the components critical to communicating the achievement levels effectively?

- How and to whom should an interpretative guide to the inappropriate and appropriate uses of NAEP achievement levels be presented and disseminated? Knowing the intended outcome and audience will inform the content development.

- How should the Governing Board highlight exemplary uses of NAEP achievement levels and address misuses of NAEP achievement levels?

- How can the Governing Board clearly and concisely explain achievement levels accurately? How can these explanations most effectively avoid misinterpretation? How can these explanations cleanly distinguish what NAEP means from what states mean by terms such as *Basic* and *Proficient* and *Advanced*?

**Materials**

To inform and to facilitate the discussion, several documents are appended to this introduction:

1. The draft revision of the Achievement Levels policy
   a. R&D members, please pay special attention to Principle 3.

2. Not attached, but click the link: [The one-pager on what achievement levels mean](#)

3. An excerpt of a technical memo which focuses on the use of NAEP achievement levels by various audiences
Developing Student Achievement Levels for the 
National Assessment of Educational Progress

Policy Statement

It is the policy of the National Assessment Governing Board to conduct a comprehensive, inclusive, and deliberative process to develop and review student achievement levels for the National Assessment of Educational Progress (NAEP). Achievement levels consist of general policy definitions for the Basic, Proficient, and Advanced levels, specific achievement level descriptions (ALDs) for each subject and grade, cut scores that demarcate adjacent levels, and exemplar items or tasks that illustrate performance at each level. This process shall be conducted according to widely accepted professional standards, to produce results that are reasonable, appropriate, and informative to the public.

The Governing Board, through its Committee on Standards, Design and Methodology (COSDAM), shall monitor the development and review of student achievement levels to ensure that the final Governing Board-adopted achievement level descriptions, cut scores, and exemplars comply with all principles and guidelines of the Governing Board Student Achievement Levels policy.

The achievement level setting process shall be carried out by contractors selected through a competitive bidding process. The process shall be managed in a technically sound, efficient, cost-effective manner, and shall be completed in a timely fashion.

Introduction

Since its creation by Congress in 1988, the Governing Board has been responsible for developing appropriate student achievement levels for NAEP assessments. The Governing Board has carried out this important statutory responsibility by engaging with a broad spectrum of stakeholders to develop student achievement levels.

Under provisions of the National Assessment of Educational Progress Authorization Act of 2002 (P.L. 107-279), Congress authorized the Governing Board to continue its mandate for developing appropriate student achievement levels for NAEP, consistent with relevant widely accepted professional assessment standards, based on the appropriate level of subject matter knowledge for grade levels assessed, and using a national consensus approach.

Given this mandate, the Governing Board must ensure that all achievement level setting processes align with current best practices in standard setting, and that appropriate validity evidence is collected and documented to support the intended uses and interpretations of NAEP achievement levels.

To develop student achievement levels for Board adoption, the Governing Board engages multiple stakeholders throughout the process, including:

Teachers  Policymakers  
Curriculum Experts  Business Representatives  
Content Experts  Parents  
Assessment Specialists  Users of Assessment Data  
State Administrators  Researchers and Technical Experts  
Local School Administrators  Members of the Public
This policy complies with the National Assessment of Educational Progress Authorization Act of 2002 (P.L. 107-279) and the documents listed below which express widely accepted technical and professional standards for achievement level setting. These standards reflect the agreement of recognized experts in the field, as well as the policy positions of major professional and technical associations concerned with educational testing. A procedures manual shall provide additional details about how this policy is implemented. As professional standards evolve and new consensus documents are released, this policy and the procedures manual shall be updated to the extent that new professional standards require.


**Principle 1: Elements of Achievement Levels**

The Governing Board is responsible for developing student achievement levels for each NAEP assessment. Achievement levels consist of general policy definitions for the Basic, Proficient, and Advanced levels, specific achievement level descriptions (ALDs) for each subject and grade, cut scores that demarcate adjacent levels, and exemplar items or tasks that illustrate performance at each level.

a) The following policy definitions will be applied to all subject areas and grades in which achievement levels are set. It is the Board’s view that the level of performance referred to in the policy definitions is what students *should know and be able to do*, not simply the current academic achievement of students or that which today’s U.S. schools expect.

**Proficient.** *This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real world situations, and analytical skills appropriate to the subject matter.*

**Basic.** *This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for Proficient work at each grade.*

**Advanced.** *This level signifies superior performance beyond Proficient.*

b) Content achievement level descriptions (ALDs) translate the general policy definitions into
specific expectations about student knowledge and skills in a particular content area, at each achievement level, for each subject and grade. Content ALDs provide descriptions of the expected knowledge, skills, or abilities of students performing at a particular achievement level. Content ALDs reflect the range of performance that items and tasks should measure. During the achievement level setting process, the purpose of content ALDs is to provide consistency and specificity for panelist interpretations of policy definitions for a given subject and grade. During reporting, content ALDs communicate the specific knowledge and skills represented by Basic, Proficient, and Advanced for a given subject and grade.

c) Cut scores mark the minimum threshold score, the lower bound, for each achievement level. Performance within a given achievement level begins at the cut score for that level and ends just below the cut score for the successive achievement level.

d) Exemplar items and student responses illustrate student performance within each of the achievement levels. They provide specific examples to help the public better understand what students in each achievement level can do.

Principle 2: Development of Achievement Level Recommendations

The Governing Board shall develop appropriate student achievement levels for NAEP, consistent with relevant widely accepted professional assessment standards, based on the appropriate level of subject matter knowledge for grade levels assessed, and using a national consensus approach.

a) A Design Document shall be developed at the beginning of the achievement level setting process, to describe in detail all planned materials, procedures, and analyses for the project. The Design Document shall be posted for public review with sufficient time to allow for a response from those who wish to provide one.

b) The development of content achievement level descriptions (ALDs) will be completed initially through the process that develops the assessment frameworks. (See the Governing Board Policy on Framework Development for additional details). The Board may then review and possibly revise content ALDs to advance the purposes they serve, whether that is guiding an achievement level setting or informing the public about the meaning of achievement levels. Whether revised or not, the ALDs that guide achievement level setting will be articulated in terms of what students should know and be able to do. There will be no content ALDs developed for performance below the Basic level.

c) An achievement-level setting panel of subject matter experts shall be convened to recommend achievement level cut scores and exemplars.

i. To ensure that they are qualified to make the judgments required by the achievement level setting process, individual panel members shall have expertise and experience in the specific content area in which the levels are being developed, expertise and experience in the education of students at the grade under consideration, and a general knowledge of assessment, curriculum, and student performance. Each panel shall reflect diversity in terms of gender, race/ethnicity, region of the country, urbanicity, and experience with students with disabilities and English language learners.
ii. This panel shall include both educators and non-educators who are considered outstanding in their field. The educator group shall include both teachers and other educators (e.g., curriculum directors, academic coaches, principals). Teachers shall comprise the majority of the panel, with non-teacher educators accounting for no more than half the number of teachers. The remaining panelists shall be non-educators who represent the perspectives of additional stakeholders, including parents, researchers, employers, and other members of the general public.

iii. The size of the panels should be responsive to what current research demonstrates is best practice and operationally feasible, but should be large enough to allow for split panels. Most NAEP achievement level settings have included approximately 20-30 panelists per grade, divided into two comparable groups with a subset of shared items.

iv. The size and specific composition of the panels may be adjusted within these general guidelines if professional standards in the field evolve.

d) Panelists shall receive training on all aspects of the achievement levels setting process to ensure that panelists are well-prepared to perform the achievement level setting tasks required of them. Training must include: the purpose and significance of setting achievement levels for NAEP; the NAEP assessment framework for the given subject area; and administration of a sample assessment under NAEP-like conditions that students experience. It is important for panelists to arrive at a common conceptualization of Basic, Proficient, and Advanced based on the content ALDs. Panelists shall be trained on each element of the judgmental task they perform, including the selection of exemplar items. They should be led by capable content facilitators (who are content experts and have previous experience with achievement level setting) and process facilitators (who have background in standard setting and experience leading panelists through the achievement level setting process). Facilitators shall take a neutral stance and not attempt to influence panelist judgments.

e) The achievement level setting method that generates cut score recommendations may differ depending upon the specific assessment. The method must have a solid research base and be appropriate for the content area, item types, number of items, scoring rubrics, and mode, as applicable.

f) Evaluations shall be administered to panelists throughout the achievement level setting process, in accordance with current best practices. Evaluations shall be part of every major component of the process, and panelists shall be asked to confirm their readiness for performing their tasks. Evaluation data may be used for formative purposes (to improve training and procedures in future meetings); summative purposes (to evaluate how well the process was conducted and provide procedural validity evidence); and to inform the Governing Board of any relevant information that could be useful when considering cut score recommendations. The panelists shall have an opportunity to indicate to the Board whether they believe the recommended cut scores are appropriate and reasonable.

g) In accordance with current best practices, feedback shall be provided to panelists, including “impact data” (i.e., the implications of their selected cut scores on the reported percentages of students at or above each achievement level).
h) The process shall consist of at least two achievement level setting meetings with distinct groups of panelists, a pilot study, and an operational meeting. The purpose of the pilot study is to conduct a full “dress rehearsal” of the operational meeting, including an opportunity to test out materials, training procedures, collection of panelist judgments, feedback given to panelists through the process, software used to conduct analyses, meeting logistics, and other essential elements of the process. The pilot study may result in minor changes to the procedures, as well as major changes that would need additional study before being implemented in an operational meeting. The pilot study provides an opportunity for procedural validity evidence and to improve the operational meeting. At the discretion of the Governing Board, other smaller-scale studies may be conducted prior to the pilot study or in response to issues raised by the pilot study. The criteria in Guideline apply to panelists of both meetings.

i) The Governing Board or its contractor shall convene a Technical Advisory Committee on Standard Setting (TACSS) to provide technical advice on all achievement level setting activities. Technical advice provided by standard setting experts throughout the project is intended to ensure that all procedures, materials, and reports are carried out in accordance with current best practices, providing additional validity evidence for the process and results. The Board or its contractor may also seek technical advice from other groups as appropriate, including NCES and the larger measurement community (e.g., the National Council on Measurement in Education).

j) All aspects of the procedures shall have documentation as evidence of the appropriateness of the procedures and results. This evidence will be made available to the Board at the time of deliberations about the achievement levels. A summary of the evidence shall be available to the public when the achievement level results are reported.

k) The exemplars chosen from the pool of released items for the current NAEP assessment shall reflect performance in the Basic, Proficient, and Advanced regions of the scale. The use of exemplars is intended to help the public better understand what students who are in each achievement levels actually know and are able to do for each subject and grade. When possible, exemplars may also be chosen that reflect performance at threshold scores. The collection of exemplars shall reflect the content found in the achievement level descriptions and the range of item formats on the assessment.

l) The outcomes from the achievement level setting panel meetings (cut scores, exemplars, and ALDs for use in reporting) shall be forwarded to the Board for their consideration.

**Principle 3: Validation and Reporting of Achievement Level Results**

The achievement level setting process shall produce results that have appropriate validity evidence for the intended uses and interpretations, are reasonable, and are informative to the public.

a) Professional testing standards define validity as the degree to which evidence supports intended interpretations and uses of test scores. The validity of achievement level results is a property of their intended interpretations and uses. Standard setting is necessarily judgmental. There are no “true” or “correct” cut scores. Instead, there is a legitimizing process that results in an authoritative consensus. In making a policy judgment to set achievement levels, the Board will examine and consider available evidence about due process and the reasonableness of results, in order to support intended uses and interpretations.
b) NAEP achievement levels are intended to estimate the percentage of students (overall and for selected student groups) in each achievement level category, for the nation, and for states and trial urban districts (TUDAs) for some subjects and grades. NAEP is prohibited by law from reporting any results for individual students or schools, so achievement levels do not apply to individual students or schools.

c) To facilitate valid uses of ALDs for reporting, the Board shall ensure that the descriptions of performance for the achievement levels reflect what the empirical data reveal about the knowledge and skills of students in that score range. The Board shall revisit and may revise content ALDs following the achievement level setting to ensure that they are consistent with empirical evidence of student performance. These revised content ALDs shall be written in terms of what students do know and empirically can do rather than what they should know and should be able to do.

d) The Board will examine and consider all evidence related to reliability and validity of the achievement level setting activities. These data shall include but need not be limited to: procedural evidence such as training, materials and panelist evaluation data; reliability evidence such as consistency across panelist type, subpanels, rounds, and meetings, if appropriate; and external comparisons to other similar assessments, if appropriate, with necessary caveats. The results from validation efforts shall be made available to the Board in a timely manner so that the Board has access to as much validation data as possible as it considers the recommendations regarding the final levels.

e) In describing student performance using the achievement levels, terms such as students performing at the Basic level or students performing at the Proficient level are preferred over Basic students or Proficient students. The former implies that students have mastery of particular content represented by the achievement levels, while the latter implies an inherent characteristic of individual students.

f) In reporting the results of NAEP, the three achievement levels of Basic, Proficient, and Advanced refer to the three regions of the NAEP scale at and above each respective cut score. The remaining region that falls below the Basic cut score will be identified as “below Basic” when a descriptor is necessary.

g) In describing the NAEP Proficient level, reports shall emphasize that the policy definition is not intended to reflect “grade level” performance expectations, which are typically defined normatively and can vary widely by state and over time. Proficient on NAEP may convey a different meaning from other uses of the term “proficient” in common terminology or in reference to other assessments.

h) When interpreting student performance using achievement levels, it is important to discourage incorrect comparisons and interpretations. For example, a Proficient cut score of 235 in reading should not be interpreted to have the same meaning as a Proficient cut score of 235 in U.S. history.

i) An interpretative guide shall accompany NAEP reports, including specific examples of appropriate and inappropriate interpretations and uses of the results.
Principle 4: Periodic Review of Achievement Levels

Periodic reviews of existing achievement levels shall determine whether new achievement level descriptions and/or cut scores are needed to continue valid and reliable measurement of student performance.

a) At least once every 10 years or 3 administrations of an assessment, whichever comes later, the Governing Board, through its Committee on Standards, Design and Methodology (COSDAM), shall review the alignment between the content ALDs and items, based on empirical data from past and recent administrations of the assessment. In its review, COSDAM (in consultation with ADC) shall solicit input from technical and subject matter experts to determine whether changes to the content ALDs and/or cut scores are warranted, making clear the potential risk of changing cut scores to trends and assessment of educational progress. Relevant factors may include but not be limited to: substantive changes in the item types; changes in the mode of administering assessments; advances in standard setting methodologies; and changes in the policy environment for using NAEP results.

b) Within the period for a review of achievement level descriptions and cut scores, changes may occur to a NAEP framework. If a framework is replaced or revised for a major update, a new achievement level setting process may be implemented automatically, except in circumstances where scale score trends are maintained. In this latter instance, COSDAM will determine how to revise the ALDs and review the cut scores to ensure that they remain appropriate and meaningful.

c) If there are major updates to a NAEP framework, the ALDs will be updated by the Framework Visioning and Development Panel. (See the Governing Board Policy on Framework Development for additional details). Following an assessment administration under the revised framework, COSDAM may decide to use empirical data to revise content ALDs to align with the revised framework.

d) As additional validation evidence becomes available, the Board shall review it and make a determination about whether the achievement levels should be reviewed and potentially redone.

Principle 5: Stakeholder Input

The process of developing student achievement levels is a widely inclusive activity. There are many opportunities to engage multiple stakeholders throughout the achievement level setting process.

a) The content achievement level descriptions are developed through the framework development process, using a panel that represents all major constituents in the various NAEP audiences, as listed in the introduction above. If it is necessary to revise the ALDs for use in achievement level setting and/or reporting, a similar group of content experts will be convened, and public comment will be sought on the resulting achievement level descriptions.

b) The process of seeking nominations for the achievement level setting panels shall include extensive outreach to multiple constituencies, such as: state and local educators; curriculum
specialists; business representatives; and professional associations in a given content area.

c) As noted in Principle 2, Guideline a, the Design Document (describing in detail all planned procedures for the project) shall be distributed for review by a broad constituency and shall be disseminated in sufficient time to allow for a thoughtful response from those who wish to provide one. All interested stakeholders shall have an opportunity to provide public comment.

d) As noted in Principle 2, Guideline c, achievement level setting panelists shall include teachers, non-teacher educators, and other interested members of the general public with relevant educational background and experience, including parents, researchers, and employers. Each panel shall reflect diversity in terms of gender, race/ethnicity, region of the country, urbanicity, and experience with students with disabilities and English language learners.

e) As noted in Principle 2, Guideline i, all achievement level setting activities shall be informed by technical advice throughout the process. The Technical Advisory Committee on Standard Setting shall provide ongoing technical input from standard setting and assessment experts, and other groups with relevant technical expertise may be consulted periodically as needed.

f) Ongoing input and coordination with staff and contractors from the National Center for Education Statistics (NCES) will ensure that all achievement level setting activities are carried out in a manner that is consistent with the design, analysis, and reporting of NAEP assessments.

g) The Governing Board may ask its standing groups representing various constituencies to provide input on the achievement level setting process.

Principle 6: Role of the Governing Board

The Governing Board, through its Committee on Standards, Design and Methodology (COSDAM), shall monitor the development and review of student achievement levels to ensure that the final Governing Board-adopted achievement level descriptions, cut scores, and exemplars comply with all principles and guidelines of the Governing Board Student Achievement Levels policy.

a) The Committee on Standards, Design and Methodology (COSDAM) shall be responsible for monitoring the development and review of achievement levels that result in recommendations to the Governing Board for any NAEP assessment under consideration. COSDAM will provide direction to the achievement level setting contractor, via Governing Board staff. This guidance shall ensure compliance with the NAEP legislation, Governing Board policies, Department of Education and government-wide regulations, and requirements of the contract(s) used to implement the achievement level setting project.

b) If there is a need to revise the initial achievement level descriptions (ALDs) created at the time of framework development for use in achievement level setting and/or reporting, the Governing Board shall take final action on revised ALDs.

c) COSDAM shall receive regular reports on the progress of achievement level setting projects.

d) COSDAM shall review and formally approve the Design Document that describes all planned
procedures for an achievement level setting project.

e) A COSDAM member may elect to attend any achievement level setting panel meeting(s) as an observer at the discretion of the COSDAM Chair.

f) At the conclusion of the achievement level setting project, the Governing Board shall take final action on the recommended cut scores, exemplars, and ALDs for use in reporting. The Governing Board shall make the final determination on the NAEP achievement levels. In addition to the panel recommendations, the Board may consider other pertinent information to assess reasonableness of the results, such as comparisons to other similar assessments.

g) Following adoption by the Governing Board, the final ALDs, cut scores, and exemplars shall be provided to the National Center for Education Statistics (NCES) for reporting the results of the NAEP assessment(s) under consideration.

h) Consistent with Principle 4 above, COSDAM shall periodically review existing achievement levels to determine whether new achievement level descriptions and/or cut scores are needed to continue valid and reliable measurement of student performance, while recognizing the value of stability and the value that is accrued by using achievement levels over time.
Excerpt of Technical Memo: 
Uses of NAEP Achievement Levels

Arthur A. Thacker, Ph.D. 
Tonya Longabach, Ph.D. 
Human Resources Research Organization (HumRRO)

The National Assessment Governing Board’s (Governing Board) recent Strategic Vision identifies policymakers, educators, researchers and business leaders, the media, and the general public as stakeholders who are expected to use National Assessment of Educational Progress (NAEP) results. The Strategic Vision is not so specific as to describe how each group is expected to use NAEP results, but it does indicate that they should be informed “about what America’s students know and can do in various subject areas and compare achievement data over time and among student demographic groups.” The Strategic Vision also states that NAEP should “inform education policy and practice.”

The Governing Board is working towards developing a statement of intended and appropriate uses for both scale scores and achievement levels. HumRRO is currently conducting a research study to determine how various audiences have used and interpreted NAEP results. However, the current lack of specificity in the inferences each group might make represents a substantial challenge for validation. We will seek out inferences the identified groups have actually made from NAEP results.

Note that this memorandum is not comprehensive. Our goal is to provide guidance on how NAEP achievement levels might be validated for making specific inferences. The number of potential inferences that might be made and the amount of documentation available to potentially support those inferences is well beyond the scope of this memorandum. The examples we include in this memorandum, while important, do not necessarily represent the most important validation issues or interpretations of NAEP achievement levels rather, they were chosen to be illustrative of the range of inferences. Where possible, we summarize the literature related to common claims, but these summaries do not represent an exhaustive literature review.

Inferences from Various Stakeholders

Policymakers

For purposes of this memorandum, we define policymakers as national and state legislators, board and committee members at the federal, state, and district level who make policy and/or recommendations for policy in education, and other individuals who make or influence educational policy (e.g., congressional staffers, lobbyists). These individuals are responsible for policy across educational institutions and have considerable power to influence curriculum, instruction, assessment, teacher

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1 This is an excerpt of Technical Memorandum #1 (HumRRO Report 2017 NO. 089), developed under contract #ED-NAG-17-C-0002, Technical Support in Psychometrics, Assessment Development, and Preparedness for Postsecondary Endeavors.

professional development, and other factors. They must address information regarding what students know and can do, and whether students are prepared for their next experiences, as policymakers strive to improve the state of American education.

Policymakers use NAEP scores and performance level descriptors for the following purposes:

- making comparisons to other districts, states, and the nation;
- making within-state subgroup comparisons;
- analyzing state achievement trends;
- suggesting changes to state assessments and to aid in defining levels of student performance;
- validating state standards and building the case for educational reform and change in their states (Zenisky, Hambleton, & Sireci, 2009); and
- building arguments for new or amended legislation and for requesting funding related to education (Edley & Koenig, 2017).

NAEP is well-structured in many ways for policymakers, who tend to be most interested in aggregate reports of student performance rather than individual student scores. NAEP is designed to generate comparable results across states and demographic groups. NAEP maintains a scale across years and allows for tracking of trends. However, when policymakers use NAEP to justify changes to state assessments or state performance definitions, build a case for educational reforms, or for requesting funding, they must support those uses based on their own understanding of NAEP and their judgements about NAEP’s suitability for those purposes.

**Educators**

For purposes of this memorandum, we define educators as those persons who work most directly with students. They are responsible for instruction and for implementing curriculum and assessments. Educators include teachers, teachers’ support personnel, content area specialists, academic coaches, etc. We also include school principals in this category, although there is some overlap with policymakers, since principals greatly influence policy within their particular schools.

Because NAEP does not produce results for individual students or at the school level, score interpretations are of limited use for educators. The achievement level descriptions (ALDs) and the frameworks, however, may provide considerable useful information. The frameworks indicate the content that students are expected to know in specific subjects at specific grades. The ALDs indicate how students will be categorized based on the level of their knowledge and skill related to that content. The ALDs help educators better understand how student performance is differentiated.

Educators receive their information about NAEP from various sources, including three main NAEP websites. They receive much of their information from their state education agency’s website and the media. NCES also supports a NAEP state coordinator in each state who serves as a liaison between the state department of education and the NAEP programs. They are available to assist in the interpretation of NAEP results. We reviewed a sample of state websites as part of preparing this memorandum. We
selected websites to reflect either high or low performance on NAEP to highlight any qualitative differences in the information presented to educators.

The three lowest performing states on NAEP 4th and 8th grade reading and mathematics and the three highest performing states based on 2015 results\(^3\) are shown in Table 1. The state Department of Education (DOE) websites and state education agency websites were searched to determine whether and how the states use NAEP data. We specifically searched for information on using NAEP for standard setting purposes.

**Table 1. Highest & Lowest Performing States on 2015 NAEP Reading and Mathematics, Grades 4 and 8**

<table>
<thead>
<tr>
<th>Subject/Grade</th>
<th>High Performing</th>
<th>Low Performing</th>
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</thead>
<tbody>
<tr>
<td>Mathematics</td>
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<tr>
<td>Grade 4</td>
<td>MA MN NH</td>
<td>AL NM MS</td>
</tr>
<tr>
<td>Grade 8</td>
<td>MA MN NH</td>
<td>AL CA MS</td>
</tr>
<tr>
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<tr>
<td>Grade 4</td>
<td>MA NH VT</td>
<td>NM CA AK MS</td>
</tr>
<tr>
<td>Grade 8</td>
<td>NH MA VT</td>
<td>MS NM LA</td>
</tr>
</tbody>
</table>

There were both differences and similarities in how the low and high performing states referred to the available NAEP data. The low performing states provided much less information about participating in NAEP and the purposes of NAEP, in general, compared to the high performing states. High performing states, on the other hand, were more likely to provide details about student performance and participation on NAEP. Many state DOE websites include links to the state NAEP results on the Nation’s Report Card website. Some state websites made a statement that comparisons can be made of how students from different states performed on NAEP, or reference studies that linked state standards to the NAEP standards. However, both low and high performing states provided little information about the explicit uses of the NAEP data for the purposes of creating state level ALDs and informing the determination of cut scores at the state level.

The websites did not include any explicit reference to whether or how NAEP standards may inform state performance standards, or how NAEP data may serve as impact data in state standard settings. The most explicit statement of the connection between state assessment and NAEP was found on the MA DOE website: “...NAEP has taken on a greater prominence under the No Child Left Behind Act and serves to externally confirm results of state assessments, such as the Massachusetts Comprehensive Assessment System (MCAS)” (National Assessment of Educational Progress Frequently Asked Questions, 2017).” The state of Vermont makes another explicit comparison between the structure of its own state science test and the NAEP science assessment standards: “The tests were designed to measure different

standards, or frameworks, on separate scoring scales, but both assessments address similar skills and content areas. These assessments provide a way to reference national, state and local science achievement” (Vermont Students Score among Best in the Nation on the National Assessment of Educational Progress, 2016). The state also points out some similarities in the pattern of scores on both the state assessment and NAEP.

Among the state websites studied, most high performing statues reported:

- trends or comparisons of successive cohorts;
- comparison of the percentage of students at or above Proficient on NAEP to the percentage of students at or above Proficient on a state test;
- point-in-time comparisons across states, districts, or population groups (e.g., Vermont included information showing an increase in the performance of students of low SES);
- performance on subscales (e.g. algebra, vocabulary, etc.)
- rank ordering of states or districts;
- comparisons across population groups to examine performance gaps; and
- comparisons across subject areas.

Lower performing states tended to mention NAEP reports less often. However, we did find some information in the comments of school administrators to the media that NAEP results were used as an indication that the current state education system was in need of reform. For example, in 2013, the superintendent of Louisiana, John White, “used the [NAEP state achievement] report to reiterate his push for the Common Core national education standards. ‘The growth this year was moderate. If we want to see something beyond incremental growth, we’ve got to raise our standards, and the Common Core standards is the best way to do that,’ he said” (Bacon-Blood, 2013).

Researchers and Business Leaders

For purposes of this memorandum, researchers and business leaders include persons conducting educational research and individuals from private industry with an interest in elementary and secondary student performance. Currently, NAEP data use and interpretation research by these stakeholders may take the following directions (Edley & Koenig, 2017):

- track trends in and compare the performance of successive cohorts,
- make point-in-time comparisons across states and school districts,
- compare the performance of population groups within and across states (performance gaps),
- rank order the performance of states and compare state to national performance;
- compare performance across tested subject areas,
- examine relationships among student performance and selected student/school/family variables, and
- compare states’ standards for proficient performance in reading and mathematics by placing them on a common scale defined by NAEP scores (“mapping studies”).
Beginning with NAEP results from 2003, NCES conducted a series of studies that mapped each state’s grade 4 and 8 reading and mathematics proficiency levels to the NAEP scale. This mapping was designed as a mechanism to evaluate the extent to which state standards reflected the same rigor as NAEP standards, and it was used as a policy lever to encourage states to set challenging standards for their students (Edley et al., 2017). In the mapping study report by Bandeira de Mello, Bohrnstedt, Blankenship, & Sherman (2015), the NAEP score that corresponds to a state’s standard (i.e., the NAEP scale equivalent score) is determined by a direct application of equipercentile mapping. For a given subject and grade, the percentage of students reported in the state assessment to be meeting the standard in each NAEP school is matched to the point on the NAEP achievement scale corresponding to that percentage. The percentage of students passing the state standard was mapped onto the NAEP scores. The results are then aggregated over all of the NAEP schools in a state to provide an estimate of the NAEP scale equivalent of the state’s threshold for its standard (Bandeira de Mello et al., 2015).

Peterson and Ackerman (2015) took a different approach to the comparison of state achievement scores and NAEP scores. They calculated the difference between the percentage of students considered “proficient” by both the state and NAEP assessments. The magnitude of the difference was considered to indicate how rigorous the state standards are as compared with NAEP standards.

These examples indicate that some researchers and policymakers do consider NAEP achievement levels to be a standard that states should strive toward. At the same time, some researchers caution against using NAEP as an infallible measure of state educational achievement due to fundamental differences between the state and NAEP frameworks and standards (e.g., Ho & Haertel, 2007). It is important to remember that determining the score equivalency between NAEP scale and state scale does not say anything about the equivalency or lack thereof in knowledge and skills associated with the score. The NAEP and state assessments may or may not measure the same knowledge and skills. An alignment study would need to be conducted to assess the extent to which the two assessments measured the same construct.

Many studies focused on validity evidence based on relationships with external variables, that is, setting benchmarks on NAEP that are related to concurrent or future performance on measures external to NAEP. Examples are academic preparedness for college; international tests; state tests and their alignment with NAEP (Edley et al., 2017). The studies indicate that there is considerable correspondence between the percentages of students at NAEP achievement levels and the percentages on other assessments (Gattis et al., 2016; Jia et al., 2014; Lim & Sireci, 2017; Neidorf, Binkley, Gattis, & Nohara, 2006; Phillips, 2014a, 2014b; Poland & Plevyak, 2015; Provasnik, Lin, Darling, & Dodson, 2013). These studies show that the NAEP achievement-level results (the percentage of students at the advanced level) are generally consistent with the percentage of U.S. students scoring at the reading and mathematics benchmarks on the Programme for International Student Assessment (PISA), the mathematics benchmarks on Trends in International Mathematics and Science Study (TIMSS), and at the higher levels for College Board Advanced Placement (AP) exams. For example, a report by Fields (2014) states that the content of the 12th grade NAEP reading and mathematics assessments was found to be similar to widely recognized tests used for college admission and placement. A linking study by Moran, Freund, & Oranje (2012) determined that there is a higher correlation between NAEP and SAT mathematics scores than between NAEP and SAT reading scores. The SAT reading benchmark, however,
was closer to the NAEP Proficient score than the SAT math benchmark. Several studies investigated the relationship between NAEP Proficient and college and career readiness (Moran, Oranje, & Freund, n.d.; Schneider, Kitmitto, Muhusani, & Zhu, 2015), but the relationship was found to be fairly weak. Additional research in this area was proposed.

During the August 2016 Governing Board quarterly meeting, researchers provided the following recommendations regarding the use of NAEP data.

- Panelists urged the Governing Board to enable linkages from NAEP data to state-level or national-level to conduct research about the long-term effects of educational policies.
- All panelists agreed that while NAEP data describe trends in student achievement, the data do not support conclusions about the reasons for these trends. Additional research is needed to discover factors that can improve schools and student learning.
- It was suggested that the NAEP data be used to compare the performance of districts with similar demographic characteristics, such as poverty levels. NAEP data may be used to guide best practices on what works in the improvement of educational achievement.

The Media

While academic and research articles provide scientific, well-reasoned rationales for or against the specific interpretations of NAEP, articles by the media present a different side. They tell the story of those who are trying to use information under real-life conditions from the assessments that the academics are studying, and the real-world challenges and issues experienced by practitioners in the field.

Articles in publications like Education Week illustrate that there is a large degree of confusion accompanying the application and interpretation of NAEP standards. While many researchers and even state officials may assume the debate about the application of NAEP standards is resolved, magazine and newspaper articles question whether it is appropriate for states to incorporate NAEP standards into the standards of the state, and what the appropriate uses for NAEP scores are in general.

One point of argument is lack of clarity on the meaning of “proficient” and the application of that meaning to state standards. Not all media representatives consistently clarify for the public that NAEP Proficient is not grade-level proficiency and that NAEP Proficient is intended to be an aspirational standard. What makes this matter more complicated is that under the No Child Left Behind Act (NCLB), states had to create achievement levels that were grade-specific and most states chose to adopt the ALD title of “Proficient.” Reconciling these sets of standards causes additional conflict and confusion when states are trying to create their achievement levels and communicate them to the public. One suggestion to make the situation more understandable is for policymakers to explain to the stakeholders “what are good goals for educational purposes compared to what is appropriate for accountability when establishing cut scores on their state assessments” (Hull, 2008), why they may be different, and which performance levels are more appropriate for each specific purpose.
Many researchers are concerned that information from NAEP gets misinterpreted by the media and politicians, sometimes to serve the interests of specific groups. Various misinterpretations of NAEP results are frequently used by the politicians and media, giving rise to the term “misNAEPery” (Sawchuk, 2013). One prominent example of this inappropriate interpretation includes tying an increase in state NAEP scores to some specific policy or intervention implemented by the state, and a decrease – to a policy that was proposed by an organization, but then not implemented. In practice, it is very challenging to make these causal connections. Organizations that are using NAEP scores to bolster claims about the effects of a specific policy are likely not interpreting the NAEP scores correctly (Chingos & Blagg, 2015).

A number of misinterpretations come from the misunderstanding of NAEP’s definition of “proficient”, with some reporters claiming that being below proficient means being “below grade level.” Yet another source of confusion comes from comparing state assessment scores with NAEP scores and arriving at opposing conclusions. Comparing the achievement of different student population groups is often fraught with misinterpretations as well (e.g., treating the NAEP achievement scale as continuous between grades and comparing achievement of one population at a higher grade to the achievement of another population at a lower grade).

At least in part, these misinterpretations arise from a lack of readily available or accessible information on how the NAEP scores should be interpreted, what the appropriate uses of these scores are, and what conclusions are appropriate to make. Educational researchers call for using caution in deciphering which claims are appropriate and for discouraging the propagation of false claims about NAEP data interpretation (Polikoff, 2015a, 2015b).

The General Public

The general public may not have sufficient knowledge and training to understand the intent and the meaning of state or national assessments and may have a difficult time critically evaluating information coming from various, often conflicting, sources. The media may make the situation in education appear more critical or negative than it really is. For example, if a state performs as one of the best on NAEP, but there is no growth in scores, the general public may see headlines like “Public education test results are dismal. Schools are failing NH children” (Levell, 2016). In addition, the information provided by the media may not be completely objective, and score interpretations may be promoting a specific political agenda.

There is some confusion among the general public regarding why their state may have high scores on the state assessments, but low scores on NAEP (Weiss, 2016; Dillon, 2005). This may occur if the state set standards lower than NAEP standards, or if the state simply has different content standards. There may also be conflicting information on exactly how the state standards compare to NAEP standards; this may cause one study to claim that a state has low standards, and another study – that the state is either lagging behind others, or low on scores from some other perspective. A study by Achieve⁴, describes several NAEP objectives at grade 4 contrasted with the grade those same objectives are introduced in several states’ standards documents. The objective “Use simple ratios to describe problem situations,” is

typically introduced in grade 6 in many states. Discrepancies like this add complexity to potential comparisons between NAEP results and state testing results.

One potential goal would be for the general public to be able to use state and national assessments to make decisions about whether children are getting the best education in their particular state. It is likely impossible to make such inferences at the school or even classroom level from state and national assessments. The media, however, may make it sound like those conclusions are appropriate and necessary. The same article by Levell (2016) that proclaimed the failure of New Hampshire public education, for example, suggests that, based on the fact that there was little to no growth in the student scores on state assessments or NAEP, the parents should “[e]ngage your local school board and question why they are using College and Career Readiness Standards and tests that are not providing a better education for our children;” consider a transfer to a charter or private school; or refuse to have their child take a state assessment. It may be helpful for the general public to have access to a source of clear, easy to understand, reliable information on the kinds of inferences that can legitimately be made from state and national assessments.
References


For each NAEP assessment, the Governing Board’s congressionally mandated responsibilities include developing assessment objectives and test specifications. To inform discussions about future NAEP assessment framework updates, the Governing Board awarded a contract as a result of a competitive bidding process in August 2017 to the American Institutes for Research (AIR) to gather and analyze mathematics content standards used across the country. This review develops a descriptive and detailed picture of how mathematics curricular content across states relates to what NAEP assesses in mathematics at grades 4 and 8.

AIR collected mathematics content standards for grades K through 8 from all 50 states, the District of Columbia, and the Department of Defense Education Activity. Using a combination of external experts and mathematics specialists within AIR, state mathematics content standards were compared with 2017 NAEP Mathematics Framework objectives. The AIR project team compiled individual ratings from the external experts, and discussions at an in-person meeting focused on coming to consensus to finalize aggregate ratings.

Ratings describe the conceptual match between NAEP and state math objectives as not aligned, complete, partial, or extended, thereby identifying whether students have had the opportunity to learn what NAEP assesses based on each state’s standards. For matches rated as partial, the comparison process captured “Missing Content”, i.e., content covered in NAEP objectives but not covered in the state standards. For matches rated as extended, the rating process noted “Extra Content” that state standards included but were not included in NAEP objectives. As a follow-up to this rating process, AIR specialists searched for the Missing Content in each state’s mandated subject-area standards outside of mathematics. Together, the analyses provide:

- a state-by-state picture of the coverage of NAEP objectives by state mathematics standards
- NAEP content that is not covered in state mathematics standards (Missing Content) and the extent to which it may be covered in the curricula of states’ other mandated subjects
- a set of consolidated state mathematics content standards that are not reflected in the NAEP framework and the extent to which these are covered across states (Extra Content)

Results will be presented by AIR Task Leaders Tad Johnston and Beth Ratway, who each hold extensive content expertise from teaching, analysis, development, and implementation of mathematics standards. AIR Project Director Maria Stephens has provided day-to-day leadership, reflecting her deep experience leading previous content comparison studies on NAEP and international assessments.
National Assessment Governing Board

Friday, May 18, 2018

Implementing the NAEP Assessment Schedule Priorities

Setting the National Assessment of Educational Progress (NAEP) Assessment Schedule is one of the Governing Board’s most important statutory responsibilities. Historically, the Governing Board has amended the NAEP Assessment Schedule to reflect legislative changes to NAEP’s authorization, new opportunities, and evolving expectations in what students should know and be able to do. According to the Governing Board’s General Policy on Conducting and Reporting NAEP, the Board “periodically establishes a dependable, publicly announced assessment schedule of at least ten years in scope. The schedule specifies the subject or topic (e.g., High School Transcript Study), grades, ages, assessment year, and sampling levels (i.e., national, state, Trial Urban District Assessment (TUDA)) for each assessment.” The current Schedule of Assessments (attached) was approved in November 2015 and extends through 2024.

The Governing Board’s Strategic Vision includes a priority to “Develop policy approaches to revise the NAEP assessment subjects and schedule based on the nation’s evolving needs, the Board’s priorities, and NAEP funding” (SV #9). To begin pursuing this strategic priority, Governing Board members engaged in small group and plenary discussions on this topic during several Board meetings over the past year. These discussions culminated in the adoption of a Resolution on Board Priorities for the NAEP Assessment Schedule (attached) at the March 2018 Board meeting.

In order to achieve the priorities of utility, frequency, and efficiency, Governing Board members have suggested exploring the feasibility of covering multiple subjects within a single assessment. During the March 2018 Board meeting, Governing Board and NCES staff described three potential approaches to designing NAEP assessments: distinct frameworks and administrations; consolidated frameworks; and coordinated administrations.

1) Distinct frameworks and administrations for each subject (current NAEP design):
   - Each assessment uses different samples of students
   - No connections among subjects even when administered in same window
   - Not possible to relate achievement on one subject to another subject
   - Best opportunity for maintaining scale score trends and achievement levels
   - Reflects priority for breadth

2) Consolidated frameworks (a change to what we are measuring):
   - New framework would cover multiple subjects
   - Single administration of new assessment with items covering multiple subjects
   - Overall scale score and achievement levels for the consolidated framework
   - New framework likely would be at larger grain size than current frameworks
   - New trend lines and achievement levels likely needed
   - Important to make sure that reporting of new construct would be meaningful
   - Fewer frameworks and assessments would lead to efficiencies
3) **Coordinated administrations** (a change to how we are measuring):
   - Frameworks remain distinct but students would receive items from multiple assessments
   - Change to student test-taking experience (with possibility of additional time)
   - Research needed to determine whether scale score trends could be maintained
   - Results include information about each subject and interrelationships (how performance on one subject relates to performance on another subject)
   - Not clear whether this would be more or less efficient than current design

On Friday afternoon, May 18th, the Board will engage in initial discussions about how to implement the Resolution on Board Priorities for the Assessment Schedule. Following a brief presentation in the plenary session, Board members will react to potential alternatives in small group discussions. The breakout discussions will be led by Governing Board members, with Governing Board staff and NCES staff participating as appropriate. The three designated breakout group facilitators (Greg Cizek, Fielding Rolston, and Linda Rosen) will report the group’s discussions at the end of the day on Friday, when the Board reconvenes in a plenary session.

No Board action on the NAEP Assessment Schedule is expected at this time.
National Assessment Governing Board Resolution on Priorities for the NAEP Assessment Schedule

Whereas, The Nation’s Report Card—also known as the National Assessment of Educational Progress (NAEP)—is mandated by Congress to conduct a national assessment and report data on student academic achievement and trends in public and private elementary schools and secondary schools (P.L. 107-279);

Whereas, the NAEP Authorization Act requires that NAEP be administered in public and private schools in reading and mathematics at least every 2 years in grades 4 and 8 and every 4 years in grade 12 and conduct the Long-Term Trend assessment in reading and mathematics for ages 9, 13, and 17;

Whereas, the NAEP Authorization Act specifies that beyond the requirements listed above, to the extent time and resources allow, NAEP shall assess and report achievement trends in additional subjects in grades 4, 8, and 12;

Whereas, the Every Student Succeeds Act mandates that states participate in the biennial reading and mathematics NAEP assessments in grades 4 and 8;

Whereas, Congress supported the establishment and expansion of the NAEP Trial Urban District Assessment (TUDA) to provide NAEP results for select large urban districts;

Whereas, NAEP provides national, state, and local policymakers and practitioners with consistent, external, independent measures of student achievement through which results across education systems can be compared at points in time and over time;

Whereas, the National Assessment Governing Board and the National Center of Education Statistics (NCES) continuously work to enhance NAEP’s form (e.g. transitioning to digital-based assessments) and content (e.g. the Technology and Engineering Literacy assessment) to reflect the modern expectations of what students know and can do;

Whereas, Congress authorized the National Assessment Governing Board to determine the NAEP subjects to be assessed;

Whereas, it is the National Assessment Governing Board’s policy, in consultation with NCES, to periodically establish a dependable, publicly announced NAEP Schedule of Assessments spanning at least ten years, and specifying the subjects, grades, ages, assessment years, sampling levels (e.g., national, state, TUDA), and introduction of new and revised frameworks for each assessment;

Whereas, on November 18, 2016 the National Assessment Governing Board unanimously adopted its Strategic Vision which included a priority to “Develop policy approaches to revise the NAEP assessment subjects and schedule based on the nation’s evolving needs, the Board priorities, and NAEP funding”;

Approved March 3, 2018
Therefore, as the National Assessment Governing Board anticipates extending the NAEP Schedule of Assessments into the future, it will uphold all of the aforementioned requirements and make decisions informed by each of the following priorities to ensure NAEP results are impactful and policy-relevant:

- **Utility** – include more voluntary state and Trial Urban District Assessments and continue to align the schedule of NAEP administrations with international assessments in the same subjects to enable actionable comparisons of districts, states, and other nations;

- **Frequency** – commit to assess subjects other than reading and mathematics at least every 4 years to provide additional measures of student academic progress at regular intervals; and

- **Efficiency** – find cost-effective ways to administer NAEP while to the degree possible maintaining a breadth of subjects on the schedule in order to continue reporting progress in student achievement;

Furthermore, the National Assessment Governing Board recognizes that any change to the NAEP Schedule of Assessments requires consideration of the fiscal, technical, and operational implications.
Schedule Information by Subject

Reading
- NAEP legislation specifies every 2 years at grades 4 and 8 for nation and states; NCLB/ESSA requires states to partake
- NAEP legislation specifies every 4 years at grade 12 for nation
- Administration has included voluntary TUDAs for grades 4 and 8 since 2002
- Administered at national level only for grade 12, and for 11-13 states voluntarily participated in 2009 and 2013
- Grade 12 assessment used to estimate % of students academically prepared for college
- Current trend lines begin in 1992
- Administration coincides with PIRLS (grade 4) once every 10 years

Math
- NAEP legislation specifies every 2 years at grades 4 and 8 for nation and states; NCLB/ESSA requires states to partake
- NAEP legislation specifies every 4 years at grade 12 for nation
- Administration has included voluntary TUDAs for grades 4 and 8 since 2003
- Administered at national level only for grade 12, and for 11-13 states voluntarily participated in 2009 and 2013
- Grade 12 assessment used to estimate % of students academically prepared for college
- Current trend lines begin in 1990 for grades 4 and 8; 2005 for grade 12
- Administration coincides with every administration of TIMSS (4 year cycle)

Science
- Has been administered approximately every 4 years at all 3 grades
- Administered to the nation, states, and (usually) voluntary TUDAs for grades 4 and 8
- Administered at national level only for grade 12
- Current trend lines begin in 2009
- Since 2011, administration has coincided with every administration of TIMSS

Writing
- Has been administered approximately every 4 years at grades 8 and 12; much less frequently at grade 4
- Under current framework (beginning with 2011 administration), has been administered to the nation only
- Previous framework included administration to states and voluntary TUDAs in 1998 (states only), 2002, 2007
History
- Has been administered at the national level approximately every 4 years at grade 8; less frequently at grades 4 and 12

Civics
- Has been administered at the national level approximately every 4 years at grade 8; less frequently at grades 4 and 12

Geography
- Has been administered at the national level approximately every 4 years at grade 8; less frequently at grades 4 and 12

Technology and Engineering Literacy (TEL)
- Has been administered at national level for grade 8 only in 2014 and 2018
- Framework covers all 3 grades

Economics
- Framework covers grade 12 only
- Has been administered at national level in 2006 and 2012

Arts
- Framework covers all 3 grades but administered at national level for grade 8 only
- Framework includes 4 areas (Dance, Music, Visual Arts, and Theatre) but only Music and Visual Arts have been included in operational assessment
- New framework is needed for transition to DBA; not feasible to complete in time for 2024 administration

Foreign Language
- Framework to measure Spanish language proficiency adopted in 2000
- Pilot test conducted in 2003 but assessment never administered operationally

High School Transcript Study
- Supplemental data collection to grade 12 Math and Science administrations
- NCES has been working to determine the feasibility of conducting this study for grade 8 and at the state level

Long-Term Trend (LTT)
- Legislation notes continuing for Reading and Math, but no periodicity specified
- Periodicity has varied but generally has been at least every 4 years until 2012
The **National Assessment of Educational Progress (NAEP) Authorization Act** established the National Assessment Governing Board to set policy for NAEP, including determining the schedule of assessments. (P.L. 107-279)

<table>
<thead>
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<th>Year</th>
<th>Subject</th>
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**NOTES:**
*Assessments not administered by computer. Beginning in 2017 all operational assessments will be digitally based.
**Science in 2015 consisted of paper-and-pencil and digital-based components.
~Long-term Trend (LTT) assessments sample students at ages 9, 13, and 17 and are conducted in reading and mathematics.
Subjects in **BOLD** ALL **CAPS** indicate the year in which a new framework is implemented or assessment year for which the Governing Board will decide whether a new or updated framework is needed.
National Assessment Governing Board
Nominations Committee

May 19, 2018
7:30 – 8:15 am

AGENDA

Closed Session

7:30 – 7:35 am  Welcome, and Agenda Overview
                 Fielding Rolston, Chair

7:35 – 7:40 am  Update on Nominations for Board Terms Beginning on
                 October 1, 2018
                 Lisa Stooksberry

7:40 – 7:50 am  Discussion: Board Terms Beginning on October 1, 2018
                 Committee Members

7:50 – 8:10 am  Discussion: Review of Governing Board Legislation and
                 By-laws
                 Fielding Rolston

8:10 – 8:15 am  Next steps
                 Fielding Rolston

8:15 am         Adjourn
Victor Bandeira de Mello

Victor Bandeira de Mello is an expert in applied statistics, mathematical modeling, statistical computing, and information systems. He directed the National Assessment of Educational Progress (NAEP) State Analysis Project, a five-year procurement, through which AIR is providing the National Center for Education Statistics (NCES) with the technical and analytical support necessary to design, conduct, and report in-depth, thematic studies of student achievement on State NAEP assessments. For Change the Equation, he is developing state-level reports on the condition of math and science education.

Dr. Bandeira de Mello has extensive experience with NCES surveys, for whom he has produced descriptive reports on state level indicators based on the NCES Common Core of Data, the Schools and Staffing Survey, and NAEP. For the Education Trust, he participated in the design of a web-based data retrieval tool through which users could easily retrieve information about schools according to performance attributes and demographics characteristics. Dr. Bandeira de Mello provided technical assistance to the Secretariat of Education of the State of Paraná, Brazil, where he directed the development, production, and dissemination of the Paraná Schools Report Card.
Sean F. Reardon

Sean Reardon is the endowed Professor of Poverty and Inequality in Education and is Professor (by courtesy) of Sociology at Stanford University. He is the developer and director of the Stanford Education Data Archive, a publicly available database containing demographic and academic achievement from every school district in the U.S. He also serves as the Director of the Stanford Interdisciplinary Doctoral Training Program in Quantitative Education Policy Analysis. This program is designed to provide doctoral students in social science disciplines and in the Graduate School of Education with advanced training in state-of-the-art quantitative methods of discipline-based education policy analysis.

His research focuses on the causes, patterns, trends, and consequences of social and educational inequality, the effects of educational policy on educational and social inequality, and in applied statistical methods for educational research. In addition, he develops methods of measuring social and educational inequality (including the measurement of segregation and achievement gaps) and methods of causal inference in educational and social science research. In particular, his work focuses on issues of residential and school segregation and of racial/ethnic and socioeconomic disparities in academic achievement and educational success.

Sean is a member of the National Academy of Education and the American Academy of Arts and Sciences. He is also a recipient of the William T. Grant Foundation Scholar Award, the National Academy of Education Postdoctoral Fellowship, and an Andrew Carnegie Fellow.

Sean received his doctorate in education in 1997 from Harvard University.
GOVERNING BOARD AND NAEP RESOURCES

TABLE OF RESOURCES AND LINKS

Attached documents are listed with page numbers. Click underlined links to access unattached documents online.

National Assessment Governing Board: Authority and Organization

- NAEP Law
- Board By-laws
- Board Composition and Responsibilities
- Board Members and Categories
- Ethics Primer for the National Assessment Governing Board
- Board Current Contracts
- Board Strategic Vision

NAEP Schedule of Assessments

- NAEP Schedule of Assessments
- History of Changes to the NAEP Schedule of Assessments
- News Releases

General Web-based Resources

- Home page of Governing Board web site
- Home page of the Nation’s Report Card web site
- Materials for previous Board meetings

Board Policies for NAEP

- General Policy: Conducting and Reporting NAEP
- Framework Development
- Item Development and Review
- Developing Student Performance Levels for NAEP
- Reporting, Release, and Dissemination of NAEP Results
  - Guidelines for the Initial Release of The Nation's Report Card
  - Resolution on Reporting 12th Grade Academic Preparedness for College
  - Resolution on Reporting on Preparedness of 12th Grade Students
- Background Questions and the Use of Contextual Data in NAEP
- NAEP Testing and Reporting on Students with Disabilities and English Language Learners
- Trial Urban District Assessment: Eligibility Criteria and Selection Procedures
  - List of Eligible TUDA Districts
• Resolution on Linking NAEP and International Assessments

NAEP Assessment Design

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Selected Board Documents and Board-commissioned Research Reports (from most to least recent)

• Board Response to the National Academies of Sciences, Engineering, and Medicine 2016 Evaluation of NAEP Achievement Levels ................................................................. 29
• Technical Report: NAEP 12th Grade Preparedness Research
• Technical Panel on 12th Grade Preparedness Research – Final Report
• The Future of 12th Grade NAEP: Report of the Ad Hoc Committee on Planning for NAEP 12th Grade Assessments in 2009
• Redesigning the National Assessment of Educational Progress

Previous “Inside NAEP” presentations

• Developing NAEP Frameworks: A Look Inside the Process
• Developing NAEP Test Questions
• Introduction to Validity
• NAEP Achievement Levels
• Sampling Concepts

Glossary of Acronyms and Other Terms ................................................................................. 35
National Assessment Governing Board

Composition
The Board is non-partisan, with 26 members representing gender, geographic, and racial-ethnic diversity. Specific categories of members specified in the NAEP law:

- **Policymakers**: governors or former governors (2), state legislators (2), chief state school officers (2), local school district superintendent (1), state (1) and local (1) school board members, nonpublic school administrator or policymaker (1)
- **Educators**: classroom teachers (3), principals (2), curriculum specialists (2)
- **Public**: general public representatives (2), parents (2), business representative (1)
- **Technical experts**: testing and measurement experts (3)

*The director of the Institute of Education Sciences serves as an ex-officio 26th member.*

Responsibilities
The responsibilities of the Board are mandated by Congress, and include:

- **Test Development**
  - Select subject areas to assess
  - Develop assessment objectives and test specifications
  - Ensure all items are free from bias
  - Have final authority on appropriateness of all items

- **Technical Methodology**
  - Develop appropriate student achievement levels
  - Design the methodology of the assessment to ensure that assessment items are valid and reliable

- **Reporting and Dissemination**
  - Develop guidelines for reporting and disseminating results
  - Plan and execute the initial public release of NAEP reports
  - Take appropriate actions needed to improve the form, content, use, and reporting of results
# National Assessment Governing Board

## Members and Categories by Term Expiration Date

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<tr>
<th>2018</th>
<th>2019</th>
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<td><strong>Shannon Garrison</strong>*</td>
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<td><strong>Dana Boyd</strong></td>
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<td><strong>Tonya Matthews</strong></td>
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<td><strong>Linda Rosen</strong></td>
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<td><em>Business Representative</em></td>
<td><em>Non-public School Administrator or Policymaker</em></td>
<td><em>Governor (Republican)</em></td>
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<td><strong>(Vacancy)</strong></td>
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<td><em>Governor (Democrat)</em></td>
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<td><em>Testing &amp; Measurement Expert</em></td>
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* Member currently serving 2nd term and/or not eligible for reappointment.

Updated 10/20/17
ETHICS PRIMER

FOR

THE NATIONAL ASSESSMENT GOVERNING BOARD

November 2009
Ethics Division
Office of the General Counsel
U.S. Department of Education
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EXECUTIVE SUMMARY

Now that you are a member of the National Assessment Governing Board ("NAGB") you need to know what ethics laws and rules apply to you. The following is a very brief summary of these rules. For a more detailed discussion of how these rules apply to you, please refer to the attached summary entitled “Ethics Laws and Rules Applicable to SGEs.”

Your Status as a Special Government Employee

You are considered an SGE and not a regular federal employee because NAGB anticipates that you will be serving the federal government through your position for only 130 days or less during any period of 365 consecutive days. Whether or not you are paid by the Board for your service is irrelevant. This summary discusses how the ethics rules apply to SGEs.

Criminal Statutes Apply to Your Activities

Some of the ethics laws that apply to you carry criminal penalties. Below is a brief summary of the most important of these laws.

- The chief conflict of interest law bars you from participating personally and substantially in your capacity as a member of NAGB in any particular matter before the federal government that has a direct and predictable effect on your own financial interests or the financial interests of others with whom you have certain relationships. See 18 U.S.C. Section 208.

- If you find yourself with a financial conflict of interest, you have four options: (1) disqualify yourself (you don’t participate in any way in the matter); (2) resign from the outside entity that is the basis for the conflict; (3) sell or divest the stock or other financial interest that is the basis for the conflict; or (4) request and obtain a statutory waiver.¹

- Two other laws prohibit you from representing a third party, with or without compensation, before any court or agency in connection with any particular matter involving specific parties in which the United States is a party or has a direct and substantial interest and in which you have participated personally and substantially as an SGE. In addition, if you serve the federal government for more than 60 days during the immediately preceding period of 365 consecutive days, these restrictions apply to any matter that is pending with NAGB. But remember that these restrictions do not apply to particular matters of general applicability, such as broadly applicable policies, rulemaking proceedings or legislation, that do not involve specific parties. See 18 U.S.C. Sections 203 and 205.

¹ In rare circumstances, with the concurrence of the U.S. Office of Government Ethics, you may obtain a waiver of the conflict of interest.
Another criminal law limits some of your activities after your service on NAGB ends. This law prohibits you from representing others in connection with the same particular matter involving specific parties in which you participated personally and substantially during your service to NAGB. This prohibition lasts for your lifetime. See 18 U.S.C. Section 207.

Standards of Ethical Conduct for Employees of the Executive Branch

The Standards of Ethical Conduct for Employees of the Executive Branch (Standards), 5 C.F.R. Part 2635, are regulations that apply both to regular federal government employees and to SGEs. However, a few exceptions exist in the Standards in recognition of the fact that SGEs are working for the government only in a very limited way. A brief synopsis of some these rules and their exceptions follow.

- **Fundraising:** You may not use your official title, position and authority to engage in fundraising.

- **Gifts:** You may not accept gifts from a “prohibited source” or offered to you because of your official position on NAGB. A prohibited source includes any person: seeking official action from NAGB; doing or seeking to do business with NAGB; conducting activities regulated by NAGB; or having interests that may be substantially affected by your official duties. There are many exceptions to this rule that are discussed in more detail in the accompanying memorandum.

- **Lobbying:** In your role as a member of NAGB, you may not urge others to contact Congress or a state legislature to urge the passage or defeat of legislation. Additional restrictions exist regarding lobbying. You should contact Department of Education’s Ethics Division before engaging in any type of lobbying.

- **Misuse of Position:** You may not use your position on NAGB or nonpublic information gained through your service on NAGB to seek advantage for yourself or others. In addition, you may not use your NAGB title in a manner that makes it appear that NAGB is sanctioning your views, products, services or personal enterprises.

- **Political Activities:** You may not engage in political activity when you are on duty or in a federal government building or car, and you may never use your official title as a member of NAGB in connection with political activities.

- **Teaching, Speaking and Writing:** You may not receive compensation for teaching, speaking or writing if: (1) the invitation was offered to you because of your position on NAGB; (2) the information conveyed by you draws substantially on nonpublic information that you obtained by working on NAGB; (3) the invitation was extended to you by an organization or person who has interests that may be substantially affected by your performance on NAGB; or (4) the subject of your work deals in a significant way
with a matter involving specific parties that you worked on while on NAGB. Again, there are some exceptions to this rule that are outlined in more detail in the accompanying memorandum.

**Required Filing of a Financial Disclosure Report By SGEs**

As a member of the NAGB, you are required to file a confidential financial disclosure report (also referred to as a “450” Report) when you are first appointed, and annually thereafter if you are reappointed. The purpose of the financial disclosure form is to protect you from inadvertently violating any of the criminal conflict of interest statutes and so that NAGB can know that your advice is free from any real or perceived conflicts of interest.

Please do not rely solely on this “Executive Summary” before undertaking your duties. There are many subtle nuances that are not discussed in this summary that may apply to your specific situation. The attached expanded summary provides additional detail that will help you better understand the ethics rules. Please feel free to call or e-mail Marcella Goodridge in the Ethics Division of the Office of the General Counsel at the U.S. Department of Education at (202) 401-8309, or Marcella.Keiller@ed.gov, for answers to any specific ethics questions that may arise in the course of your service on NAGB.
ETHICS LAWS AND RULES APPLICABLE TO SGES

I. INTRODUCTION

Although the ethics rules are numerous and detailed, a single, simple principle underlies these rules: You should never use your public office for private gain, either for yourself, or for any third party. In addition, you must refrain not only from engaging in any activity that violates the ethics rules, but you must also refrain from any activity that creates the appearance of a violation of any of these rules. The summary below is designed to help you avoid violating any ethics rules covering your activities as a member of NAGB.

II. YOUR STATUS AS A SPECIAL GOVERNMENT EMPLOYEE

A. What is a “special Government employee”?

Because you have been appointed to be a member of the NAGB and you are expected to perform your duties for not more than 130 days during the 365 days subsequent to the date of your appointment, you are, by law, a “special Government employee” (SGE). As an SGE, you are a federal government employee. This means that upon appointment, you assume the responsibilities, obligations, and restrictions that are part of public service. Because SGEs are not full-time employees, several of theses restrictions apply only in limited circumstances.

B. Do the ethics restrictions apply when I am not working for NAGB?

Yes, any restrictions concerning your private activities (representational services, expert witness activities, etc.) apply equally on days when you serve the federal government through your position on NAGB and on days when you do not, except with respect to political activity. If you have not provided any services for the federal government for some time, but have not received a termination date for your appointment, you must seek a formal resolution of the matter before engaging in conduct prohibited by the ethics rules.

III. CONFLICTS OF INTEREST

A. What criminal conflict of interest statutes apply to SGEs?

While you are employed as an SGE, you need to pay particular attention to four criminal conflict of interest laws found in Chapter 11, Title 18 of the United States Code: 18 U.S.C. Sections 203, 205, 207 and 208. These criminal laws include some special provisions for the treatment of SGEs. A discussion of these laws and certain related requirements found in other laws and regulations follows.
B. What financial conflicts of interest may arise for SGEs under section 208?

Section 208 prohibits you from participating personally and substantially in any particular matter that has a direct and predictable effect on your financial interests, including certain interests of others that are imputed to you under the statute. This means that you may not work on NAGB matters if you have certain connections – through the ownership of stock, through employment, or by virtue of other circumstances – with an organization that has a financial interest in the matter. For example, you may not work at all on a contract competition if you own stock valued at a certain amount in a company competing for the contract. You may not participate in a discussion of whether to modify an existing contract with a company if you work for that company. And, you may not assist in the development of a scope of work for a contract competition if you know that an organization on which you serve on the Board of Directors plans to compete for that contract.

In addition to your own personal financial interests, the financial interests of the following persons or organizations are imputed to you and also disqualify you from participating in a particular matter:

(1) your spouse;
(2) your minor child;
(3) your general partner;
(4) an organization for which you serve as an officer, director, trustee, general partner or employee; and
(5) any prospective employer.

Example 1 You are on the governing board of ABC, a nonprofit organization. ABC’s financial interests are imputed to you under the statute. This means that for the purpose of determining whether you have a conflict of interest, ABC’s financial interests are treated as if they were your own. Accordingly, you may not participate in any NAGB matter in which ABC has a financial interest. Similarly, if you were in the process of discussing employment with ABC, you would be barred from participating in any NAGB matter affecting the financial interests of ABC.

Example 2 You are on the governing board of ABC (or employed by ABC, own stock in ABC, seeking employment with ABC, etc). You are asked to participate in the process of reviewing and scoring contract proposals for a contract competition for a NAGB project. Fifteen organizations have submitted a bid. When you open the proposal from one organization, you note that ABC’s name is one of the organizations that has submitted a bid. Or, perhaps ABC is listed as a subcontractor in one of the proposals. This contract competition is a “particular

Keep in mind that when you are disqualified from a matter such as a contract competition, the particular matter that you must recuse yourself from is the entire competition for this contract. You are prohibited from doing anything at all with respect to this competition. This means, for example, that you may not review other proposals that are in competition with that of the organization in which you have a direct or imputed financial interest.
“matter” that will have a “direct and predictable effect” upon the financial interests of ABC. In other words, as a result of the contract competition, ABC will either gain business or not, and this decision will affect ABC financially – either negatively or positively. The amount of financial interest is not relevant – as long as ABC’s finances will be affected, unless a regulatory exemption or waiver permits you to do so, you may not work on this competition. And, because each proposal is competing against all of the others, your evaluation of competing proposals will affect the chances ABC has of winning the contract. Accordingly, you may not review any of the proposals.

You must recuse yourself from a matter as soon as you realize that you have a conflict. If, for example, you notice that you have a conflict when you are in the middle of reviewing contract proposals, you put the proposal back in its envelope and call up an NAGB staff member and let that person know that you think that you are disqualified from working on the competition. If there is any question, you should contact the U.S. Department of Education Office of the General Counsel’s Ethics Division for guidance. Once you have determined that you may not work on this matter, send the proposal back to NAGB staff.

You are permitted to participate in a particular matter affecting one campus of a multi-campus institution of higher education, where the disqualifying interest arises from your employment with a separate campus of the same institution, provided that you have no multi-campus responsibilities at the institution. If you are employed with a large university with multiple campuses and you do not have any multi-campus responsibilities, you may participate in official matters—such as grants, contracts, applications, and other particular matters—that affect the financial interests of another campus in the same university system where you are employed. Below are some examples of how section 208 may apply to your activities.

Example 3 You are employed as a professor at the University of California-Berkeley. NAGB is planning to evaluate the impact of computer-based testing on students with disabilities and English language learners. UC-Berkeley’s science and technology department has submitted a bid. NAGB’s actions will have a direct and predictable effect on the university’s financial interest. Therefore, you may not participate in any way on this matter.

Example 4 You are employed as a researcher at the University of California-Berkeley. NAGB is planning to evaluate the impact of computer-based testing on students with disabilities and English language learners. The University of California-Los Angeles (UCLA) has submitted a bid to be the contractor for NAGB’s evaluation. You may participate in this matter because it will not have a direct and predictable effect on either your financial interests or UC-Berkeley’s.
C. How do I resolve a conflict of interest?

1. Disqualification

A common method of resolving a conflict of interest is to disqualify yourself from participating in the matter.

Example 5: You are serving on NAGB’s Ad Hoc Committee that will examine issues related to computer-based testing for students with disabilities and English language learners, including developing a study of computer-based testing methodologies. The Request for Proposals has been disseminated. One of the bids submitted is from ABC Corporation (ABC). You own $20,000 worth of stock in ABC. You must advise the U.S. Department of Education Office of the General Counsel’s Ethics Division that you own stock in ABC and you will not be able to participate in any way in the entire contract competition. If ABC is awarded the contract, you will also need to disqualify yourself from the entire matter.

2. Divestiture

Divestiture of a disqualifying interest (usually through the sale of stock) is another remedy available to avoid a potential violation of section 208. SGEs are not eligible for a Certificate of Divestiture (CD). A CD is a tax benefit that allows the deferral or nonrecognition of capital gain where an employee divests a financial interest in order to comply with conflict of interest requirements. Unfortunately, Congress specifically excluded SGEs from eligibility to receive CDs. 26 U.S.C. § 1043(b)(1)(A).

3. Resignation

On some very rare occasions when none of the aforementioned options are available or feasible, an SGE may need to resign from participating in an outside activity with an entity if his or her official activities as an SGE have a direct and predictable effect on the financial interest of that entity creating an irreconcilable conflict.

4. Waiver or Authorization

Another remedy to avoid a conflicting financial interest is to request and obtain a statutory waiver by contacting the Department of Education’s Ethics Division (an authorization is similar to a waiver, but only applies to non-statutory conflicts of interest - what are often referred to as “appearances of a conflict”). You may be granted a waiver only if your financial interest is not so substantial as to be deemed to be likely to affect the integrity of your services.

Example 6: In the scenario described in Examples 1 and 2 above, you are granted a waiver permitting you to participate in a general policy matter that affects ABC’s financial interests as...
long as the matter affects all similarly situated entities in the same manner. But you would remain disqualified from participating in a matter that specifically involves ABC, which in this case means the entire contract competition.

D. What restrictions apply to my representation of third parties under sections 203 and 205?

With regard to particular matters in which you have participated personally and substantially while serving NAGB, you are prohibited from representing a third party on those particular matters, with or without compensation, before any court or agency, when the United States is a party or has a direct and substantial interest in the matter. See 18 U.S.C. Sections 203 and 205.

In addition, if you serve the federal government for more than 60 days during the immediately preceding period of 365 consecutive days, you are prohibited from representing a third party on any matter involving specific parties pending before NAGB, even if your work at NAGB did not involve these matters. These restrictions do not apply to particular matters of general applicability, such as broadly applicable policies, rulemaking procedures or legislation that does not involve specific parties.

IV. POST-EMPLOYMENT

After your appointment terminates at NAGB, you need to pay particular attention to one more criminal statute that subjects you to restrictions regarding certain matters that you may have worked on as a member of NAGB. Pursuant to 18 U.S.C. Section 207, you may never represent any third party, other than in the performance of your official government duties, in connection with the same particular matter involving specific parties in which you participated personally and substantially as a member of NAGB. This is a lifetime prohibition. For example, if you participated in a NAGB discussion concerning a contract to State University, you may never represent State University with respect to that same contract before any official of the Executive Branch of the federal government and you may never represent State University with respect to that contract in any federal court.

Further, if you serve on NAGB more than sixty days and are compensated above a certain level, you may be subject to a one-year “cooling-off” period during which you would be barred from representing before NAGB certain third parties in connection with any matter. There are some exceptions to this law as well, and you should contact the Department of Education’s Ethics Division for guidance.

V. STANDARDS OF ETHICAL CONDUCT AND OTHER ETHICS RULES

The Standards of Ethical Conduct for Employees of the Executive Branch (Standards), 5 C.F.R. Part 2635, are regulations that apply both to regular federal government employees and to SGEs. Although you are treated generally the same as regular employees under the Standards, a few
exceptions do exist for SGEs in recognition of the fact that SGEs are working for the government only in a very limited way. In addition, there are other rules that govern your conduct as an SGE, including the Hatch Act, anti-lobbying rules, the Federal Acquisition Regulation, and rules about accepting gifts and compensation from foreign governments. A brief synopsis of some of these rules follows.

A. What restrictions apply if I want to engage in fundraising?

You may not use your NAGB title, position or authority to solicit funds for any organization. In addition, you may not personally solicit funds or other support from persons whose interests may be affected substantially by the performance or nonperformance of your official duties.

B. What restrictions are there on my acceptance of gifts?

You are prohibited from accepting gifts (almost anything of monetary value) from a “prohibited source” or gifts given because of your official position as a member of NAGB, unless a specific exception applies. The definition of “prohibited source” includes any person:

- seeking official action from NAGB;
- doing or seeking to do business with NAGB; or
- having interests that may be substantially affected by your official duties at NAGB.

The definition also includes organizations the majority of whose members fall within any of these categories. You may accept various benefits resulting from your outside business or employment activities, if a reasonable person would conclude that such benefits are not offered or enhanced because of your official position. The most commonly applicable exceptions to the gift rule allow you to accept:

- Modest items of food other than a meal, such as coffee, soft drinks, or donuts;
- Most plaques, certificates and trophies;
- Discounts available to all Government employees;
- Anything for which you pay market value;
- Gifts valued at $20 or less per occasion, totaling no more than $50 in a calendar year from any one source;
- Gifts clearly motivated by friendship or family relationship;
- Gifts resulting from your outside business activities, including those of your spouse; and
- Free attendance or meal which is provided by:
  1. the sponsor of the event for the day on which you are speaking at the event, or for a widely-attended gathering of mutual interest to a number of parties when the necessary determination of agency interest has been made; or
  2. someone other than the sponsor of a widely-attended gathering of mutual interest to a number of parties when more than 100 people are expected to attend, the
aggregate value of the gift is under $335, and the necessary determination of agency interest has been made.

C. What restrictions apply if I want to “lobby” Congress?

NAGB and its members are permitted to communicate directly with Congress in their official capacity on matters that are related to legislation or appropriations deemed necessary to conduct NAGB’s “public business” (i.e., the NAGB’s statutory functions and responsibilities). However, the Anti-Lobbying Act, 18 U.S.C. Section 1913, prohibits you, in your official capacity at NAGB, from engaging in “grass-roots lobbying” (i.e., directly or indirectly suggesting or requesting that others contact Congress or a state legislature to urge the passage or defeat of proposed or pending legislation), even if it is related to the NAGB’s public business. The Anti-Lobbying Act also requires that any permissible direct communications with Congress in your official capacity at NAGB be made only through official channels.

None of these restrictions prohibit you from lobbying members of Congress or state legislatures, or urging others to do so, on your own time in your personal capacity. If you lobby Congress or state legislatures in your personal capacity, and the issue is related to NAGB’s business, you should make it clear that you are not representing NAGB and not acting in your official capacity as a member. Also, please note that when you are lobbying as a private citizen, you are not permitted to use government resources or equipment (including, but not limited to, computers, telephones, fax machines, copy machines, stationery), or seek assistance from NAGB staff.

D. What does “misuse of position” mean?

You may not use your position on NAGB to seek advantage for yourself or others. You also may not use nonpublic information gained through your service at NAGB to seek advantage for yourself or others. Finally, you may not use your NAGB title in a manner that makes it appear that the NAGB is sanctioning your views, products, services or personal enterprises. Of course, you may list your membership on NAGB on your curriculum vitae, but you may never use your status as an NAGB member to advertise or promote your personal activities. Please seek advice from the Department of Education Office of the General Counsel’s Ethics Division if you have any questions in this area.

E. May I keep my day job and still serve on NAGB?

Yes, you may continue to collect your regular salary from an outside employer for days on which you are providing services to the federal government (whether your federal government service is paid or unpaid). However, if you have another consultant or advisory position with NAGB or any other federal department or agency, you may not receive per diem or salary from NAGB for the same day for services performed for the two positions.

F. Are there any restrictions on my political activities?

You may not engage in any political activities while you are on duty (i.e., performing
government services) or when you are in a government building or vehicle. Although you are not subject to any restrictions on your political activities when you are not performing government services, you may never use your official title as a member of NAGB in connection with any political activities.

G. What restrictions do I face if I want to teach, speak, or write on matters that are related to the duties I perform for NAGB?

You may not receive compensation for teaching, speaking, or writing if:

- the activity is performed as part of your official duties (e.g., a speech on behalf of NAGB);
- the invitation to engage in the activity was extended primarily because of your official position at NAGB, rather than expertise in the subject matter;
- the invitation or offer of compensation was extended to you by someone with interests that may be affected substantially by your duties;
- the information conveyed through the activity draws substantially on nonpublic information obtained through your service at NAGB; or
- the activity deals, in significant part, with a matter involving specific parties to which you are currently assigned or had been assigned during your current NAGB appointment.

Notwithstanding the restrictions in bold type you may accept compensation for teaching a course requiring multiple presentations offered as part of: (a) the regularly established curriculum of various specified types of educational institutions; or (b) educational or training programs sponsored and funded by federal, State, or local government. However, if you teach at an educational institution, you must not participate in any NAGB matters that involve that institution.

H. What restrictions apply if my government duties involve the awarding of contracts?

If you are involved in the awarding of any contracts, please seek advice from the Ethics Division. There are special provisions that cover your involvement in the awarding of contracts. For example, you may not accept compensation as an employee, officer, director, or consultant of a contractor within the one-year period after leaving Government service where you participated in certain procurement matters pertaining to that contractor. In addition, if you disclose certain information pertaining to Federal procurements that you obtained during your service on a committee, you may face sanctions, including criminal penalties.
I. What restrictions apply to my interaction with foreign entities?

The emoluments clause of the U.S. Constitution prohibits you from receiving any emolument, office or title of any kind from a foreign government, including political subdivisions of a foreign government. An emolument is compensation received by virtue of holding an office or having employment with a foreign government and includes, for example, salary, honoraria, transportation, per diem allowances, household goods, shipment costs, and housing allowances. This clause has been interpreted to be broader than the traditional notion of employment and includes, for example, income received through a partnership when an identifiable portion of the partnership draw can be attributed to the partnership’s fees from such foreign government. This provision has particular relevance to positions with foreign universities that are government-operated, as opposed to private institutions. United States Constitution, art. I § 9, cl. 8. There are also statutory provisions restricting acceptance of gifts from foreign governments. 5 U.S.C. § 7342. You should seek advice from the Ethics Division regarding the details about these restrictions. Additionally, a criminal statute bars employment or consultation with a foreign entity for the purpose of providing foreign agent representation or lobbying. 18 U.S.C. § 219.

The ban on participating in foreign agent activities covered by the Foreign Agents Registration Act (FARA) prohibits representation of foreign governments or foreign political parties before the United States Government, as well as a number of other activities conducted within the United States on behalf of such entities. There are certain FARA exceptions related to trade or commerce, legal representation, humanitarian fundraising, and religious, scholastic, or scientific pursuits. The Lobbying Disclosure Act of 1995 requires certain covered Federal officials who serve as agents of foreign principals (other than foreign governments or foreign political parties) to register if they work on behalf of foreign corporations, associations, or other organizations.

Finally, certain restrictions apply after your position with NAGB terminates. Specifically, 18 U.S.C. § 207 includes restrictions on former employees who participated in trade or treaty negotiations on behalf of the United States (18 U.S.C. § 207(b)) and on former senior employees who wish to represent, or aid or advise in the representation of, a foreign entity with the intent to influence a decision of a Federal employee or agency (18 U.S.C. § 207(f)).

J. What do I do if I am called to be an expert witness?

Government employees generally may not participate as an expert witness, with or without compensation, other than on behalf of the United States, in any proceeding before a federal court or agency in which the United States is a party or has a direct and substantial interest. This restriction applies to most SGEs only if the SGE actually participated officially in the same proceeding or in the particular matter that is the subject of the proceeding. If you are appointed by the President, serve on a commission established by statute, or serve (or are expected to serve) for more than 60 days in a period of 365 days, the restriction on expert service also applies to any proceeding in which NAGB is a party or has a direct and substantial interest.
K. May I keep and use frequent flyer miles that I earn when I am on official NAGB travel?

Yes, you may use frequent flyer miles or other airline awards or promotions accumulated on official NAGB travel for your own personal use.

VI. CONCLUSION

We understand that these laws are complex and may not be intuitive. Again, we caution you that this summary is merely an introduction to the ethics laws and rules that apply to you. You should always feel free to contact the Department of Education Office of the General Counsel’s Ethics Division with any questions or concerns.

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(202) 260-5104 (fax)

Marcella.Keiller@ed.gov
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Updated January 2018
The Nation’s Report Card, also known as the National Assessment of Educational Progress (NAEP), was developed in 1969 to answer the important question: “How are our nation’s students doing?” The National Assessment Governing Board established this Strategic Vision to not only answer the first question, but also to expand NAEP’s impact by addressing a second question: “How can NAEP provide information about how our students are doing in the most innovative, informative, and impactful ways?”

Congress created the independent, bipartisan Governing Board in 1988 to set policy guidelines for The Nation’s Report Card, which is the largest nationally representative, continuing evaluation of the condition of education in the United States. In statute Congress charged the Governing Board to identify NAEP subjects to be tested, determine the content and achievement levels for each assessment, approve all test questions, and take steps to improve the form, reporting, and use of results.

The Governing Board partners with the National Center for Education Statistics, which administers the NAEP program, to inform a wide range of stakeholders—including policymakers, educators, researchers, business leaders, the media, and the general public—about what America’s students know and can do in various subject areas, and compare achievement data over time and among student demographic groups. This allows the nation to understand where more work must be done to improve learning among all students.

The Governing Board fulfills its statutory mission by continuously reviewing and revising its policies and practices to ensure The Nation's Report Card measures and reports meaningful information to the public.

The educational landscape of the 21st century demands increased academic ambition, greater technological sophistication, improved civic participation, and expanded global perspectives for all students. In this time of rapid and accelerating change, it is essential for The Nation’s Report Card to support innovation and address the need to improve student achievement, while maintaining its timeless promise to serve as the constant and unassailable measure of student achievement for our nation.

To increase the value of The Nation’s Report Card as a resource to impact student achievement, the Governing Board adopted this Strategic Vision with a dual focus on innovating to enhance NAEP’s form and content and informing stakeholders to expand NAEP’s dissemination and use.
The National Assessment Governing Board will promote The Nation’s Report Card’s wealth of information to facilitate the awareness and uses of NAEP in appropriate, timely, new, and meaningful ways. Examples of NAEP resources include: results; trends; test questions and tasks; studies; measurement innovations; frameworks that specify the content and design of NAEP assessments; and contextual variables about student demographics and educational experiences collected from students, teachers, and schools. The Governing Board will:

- Strengthen and expand partnerships by broadening stakeholders’ awareness of NAEP and facilitating their use of NAEP resources.
- Increase opportunities to connect NAEP to administrative data and state, national, and international student assessments.
- Expand the availability, utility, and use of NAEP resources, in part by creating new resources to inform education policy and practice.
- Promote sustained dissemination and use of NAEP information beyond Report Card releases with consideration for multiple audiences and ever-changing multi-media technologies.

The National Assessment Governing Board will revise the design, form, and content of The Nation's Report Card using advances in technology to keep NAEP at the forefront of measuring and reporting student achievement. The Governing Board will:

- Develop new approaches to update NAEP subject area frameworks to support the Board’s responsibility to measure evolving expectations for students, while maintaining rigorous methods that support reporting student achievement trends.
- Continue improving the content, analysis, and reporting of NAEP contextual variables by considering the questions' relevance, sensitivity, and potential to provide meaningful context and insights for policy and practice.
- Research policy and technical implications related to the future of NAEP Long-Term Trend assessments in reading and mathematics.
- Research assessments used in other countries to identify new possibilities to innovate the content, design, and reporting of NAEP.
- Develop policy approaches to revise the NAEP assessment subjects and schedule based on the nation’s evolving needs, the Board’s priorities, and NAEP funding.
- Develop new approaches to measure the complex skills required for transition to postsecondary education and career.

This Strategic Vision will focus the work of the Governing Board through the year 2020. By pursuing these priorities, the Governing Board will ensure that The Nation’s Report Card provides the country with valuable data that measure and contribute to the improvement of student progress in achieving important knowledge and skills necessary for success as citizens in our democratic society.

Unanimously approved November 18, 2016
The National Assessment of Educational Progress (NAEP) Authorization Act established the National Assessment Governing Board to set policy for NAEP, including determining the schedule of assessments. (P.L. 107-279)

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NOTES:
*Assessments not administered by computer. Beginning in 2017 all operational assessments will be digitally based.
**Science in 2015 consisted of paper-and-pencil and digital-based components.
~Long-term Trend (LTT) assessments sample students at ages 9, 13, and 17 and are conducted in reading and mathematics.
Subjects in **BOLD ALL CAPS** indicate the year in which a new framework is implemented or assessment year for which the Governing Board will decide whether a new or updated framework is needed.
History of Changes to the NAEP Schedule of Assessments

Historical Schedule Changes
The major schedule changes adopted by the Board since 2000 are listed below:

1. Added grade 4 and 8 state-level Reading and Mathematics every two years. (2002)  [Prior to the 2002 ESEA reauthorization (NCLB), state assessments at grades 4 and 8 were given every two years with reading and writing in one biennium and mathematics and science in the next, i.e., these subjects and grade 12 subjects were tested once every four years.]
2. Added the High School Transcript Study (HSTS) as a regularly scheduled study. (2005)
4. Added Technology and Engineering Literacy (TEL) to the NAEP subjects assessed. (2005)
5. Added grade 12 state-level Reading and Mathematics for volunteer states with a periodicity of every four years. (2008)
6. Adjusted the periodicity of science to correspond to the periodicity of TIMSS to conduct international benchmarking studies in mathematics and science. (2010)
7. Scheduled Writing as a technology based assessment, beginning with national data collections only and delaying fourth grade in order to complete a special study. (2010)

Other schedule changes and program adjustments from 2000 through 2015 have been due primarily to budget constraints and/or technical challenges, considering options such as:

- Assessing fewer grade levels in non-required subject areas (e.g., U.S. History, Civics, and Geography; Writing; TEL).
- Postponing a state-level assessment.
- Postponing a full assessment/study (e.g., World History, Foreign Language, HSTS).

Guiding Principles for Schedule Changes
The Governing Board’s guiding principles and priorities for schedule changes are to:

- follow the requirements in the National Assessment of Educational Progress Authorization Act, which includes the mandate to assess reading and math at the state level every two years and additional subjects as time and resources allow;
- adhere to the Governing Board’s General Policy: Conducting and Reporting the National Assessment of Educational Progress; and
- reflect the current priorities of the Governing Board to:
  - Administer all assessments using technology beginning in 2017,
  - Continue to assess broad-based curricular areas with a priority for science, technology, engineering, and mathematics (STEM); and
  - Provide state-level data in curricular areas beyond reading and mathematics.

Guidance for the schedule is found in NAEP Authorization Act Sec. 303(b)(2) which addresses the use of random sampling (A), testing in reading and mathematics at grades 4 and 8 once every two years (B), and testing in reading and mathematics at grade 12 at regularly scheduled intervals (at least as often as prior to NCLB) (C).

After this initial guidance, Sec. 303(b)(2)(D) provides guidance for including other subjects in grades 4, 8, and 12 to the extent time and resources allow. It says, including assessments “… in regularly scheduled intervals in additional subject matter, including writing, science, history, geography, civics, economics, foreign languages, and arts, and the [long term] trend assessment described in subparagraph (F).”
Overview of NAEP Assessment Design
The content and format for each NAEP subject-area assessment is determined by a NAEP assessment framework, developed under the Governing Board’s direction. General details about the structure of NAEP assessments include:

Long Test, Short Student Test Booklet
- Each student gets a small part of the test
- No individual student scores

Common Block Structures Across Subjects
- Items are within blocks, blocks are within booklets
  Example:
  At grade 4: Reading has 10 blocks and Math has 10 blocks

Test Question Types
- Multiple-choice
- Open-ended
- Computer-based tasks (Writing, Science, TEL)

Contextual Questions
- Student, teacher, administrator questionnaires

Student Booklet Block Design
While some NAEP assessments are conducted on a technology-based platform (TEL, Writing), for paper-based assessments NAEP uses a focused balanced incomplete block (BIB) or partially balanced incomplete block (pBIB) design to assign blocks or groups of cognitive items to student booklets. Because of the BIB and pBIB booklet designs and the way NAEP assigns booklets to students, NAEP can sample enough students to obtain precise results for each test question while generally consuming an average of about an hour and a half of each student's time.

The "focused" aspect of NAEP's booklet design requires that each student answer questions from only one subject area. The "BIB" or "pBIB" design ensures that students receive different interlocking sections of the assessment forms, enabling NAEP to check for any unusual interactions that may occur between different samples of students and different sets of assessment questions.

In a BIB design, the cognitive blocks are balanced; each cognitive block appears an equal number of times in every possible position. Each cognitive block is also paired with every other cognitive block in a test booklet exactly the same number of times. In a pBIB design, cognitive blocks may not appear an equal number of times in each position, or may not be paired with every other cognitive block an equal number of times. NAEP booklet design varies according to subject area (e.g., geography, mathematics, reading, science, U.S. history, writing).
Once the instrument developer has laid out the configuration of all blocks for each booklet in a booklet map shown here with the following column headings,

<table>
<thead>
<tr>
<th>Booklet number</th>
<th>Cognitive block 1</th>
<th>Cognitive block 2</th>
<th>Contextual question directions</th>
<th>General student contextual questions</th>
<th>Subject-specific contextual questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

the number of rows (booklet numbers) provides the booklet spiral design information needed for the bundling of the student booklets.


**NAEP Assessment Sample Design**

Each assessment cycle, a sample of students in designated grades within both public and private schools throughout the United States (and sometimes specified territories and possessions) is selected for assessment. In addition, in state assessment years, of which 2007 is an example, the samples of public schools and their students in each state are large enough to support state-level estimates. In all cases, the selection process utilizes a probability sample design in which every school and student has a chance to be selected, and standard errors can be calculated for the derived estimates.

**Public School Selection in State Assessment Years**

The selection of a sample of public school students for state assessment involves a complex multistage sampling design with the following stages:

- Select public schools within the designated areas,
- Select students in the relevant grades within the designated schools, and
- Allocate selected students to assessment subjects.

The Common Core of Data (CCD) file, a comprehensive list of operating public schools in each jurisdiction that is compiled each school year by the National Center for Education Statistics (NCES), is used as the sampling frame for the selection of sample schools. The CCD also contains information about grades served, enrollment, and location of each school. In addition to the CCD list, a set of specially sampled jurisdictions is contacted to determine if there are any newly formed public schools that were not included in the lists used as sampling frames. Considerable effort is expended to increase the survey coverage by locating public schools not included in the most recent CCD file.

As part of the selection process, public schools are combined into groups known as strata on the basis of various school characteristics related to achievement. These characteristics include the physical location of the school, extent of minority enrollment, state-based achievement scores, and median income of the area in which the school is located. Stratification of public schools
occurs within each state. Grouping schools within strata by such selected characteristics provides a more ordered selection process with improved reliability of the assessment results.

On average, a sample of approximately 100 grade-eligible public schools is selected within each jurisdiction; within each school, about 60 students are selected for assessment. Both of these numbers may vary somewhat, depending on the number and enrollment size of the schools in a jurisdiction, and the scope of the assessment in the particular year. Students are sampled from a roster of individual names, not by whole classrooms. The total number of schools selected is a function of the number of grades to be assessed, the number of subjects to be assessed, and the number of states participating.

Private School Selection in State Assessment Years
In years in which state-level samples are drawn for public schools, private schools are classified by type (e.g., Roman Catholic, Lutheran, etc.), and are grouped for sampling by geography (Census region), degree of urbanization of location, and minority enrollment. About 700 private schools, on average, are included, with up to 60 students per school selected for assessment. These samples are not large enough to support state-level estimates for private schools. Thus, inferences for private schools are limited to the national level, even in years when public school assessments are state-specific.

A national sample of private schools in all grades is then drawn from a list compiled through the Private School Universe Survey (PSS), which is a mail survey of all U.S. private schools carried out biennially by the U.S. Census Bureau under contract to NCES. The PSS list is updated for new schools only for a sample of Roman Catholic dioceses.

National-Only Assessment Years
In years when the NAEP samples are intended only to provide representation at the national level and not for each individual state, the public and private school selection process is somewhat different. Rather than selecting schools directly from lists of schools, the first stage of sampling involves selecting a sample of some 50 to 100 geographic primary sampling units (PSUs). Each PSU is composed of one or more counties. They vary in size considerably, and generally about 1,000 PSUs are created in total, from which a sample is selected. Within the set of selected PSUs, public and private school samples are selected using similar procedures to those described above for the direct sampling of schools from lists. The samples are clustered geographically, which results in a more efficient data collection process. The selection of PSUs is not necessary when the sample sizes are large in each state, as in state assessment years.

Source: http://nces.ed.gov/nationsreportcard/tdw/sample_design/default.aspx

NAEP Alliance Contractors
NAEP is conducted by the Assessment Division of NCES, which also works with a series of contractors. The following chart presents the structure of the collaboration between these contractors.
NAEP Alliance Contractors

To learn more about NAEP contractors in addition to the NAEP Alliance contractors, visit:
http://nces.ed.gov/nationsreportcard/contracts/history.aspx
National Assessment Governing Board’s Response to the National Academies of Sciences, Engineering, and Medicine 2016 Evaluation of NAEP Achievement Levels

Legislative Authority

Pursuant to the National Assessment of Educational Progress (NAEP) legislation (Public Law 107-279), the National Assessment Governing Board (hereafter the Governing Board) is pleased to have this opportunity to apprise the Secretary of Education and the Congress of the Governing Board response to the recommendations of the National Academies of Sciences, Engineering, and Medicine evaluation of the NAEP achievement levels for mathematics and reading (Edley & Koenig, 2016).

The cited legislation charges the Governing Board with the authority and responsibility to “develop appropriate student achievement levels for each grade or age in each subject area to be tested.” The legislation also states that “such levels shall be determined by... a national consensus approach; used on a trial basis until the Commissioner for Education Statistics determines, as a result of an evaluation under subsection (f), that such levels are reasonable, valid, and informative to the public; ... [and] shall be updated as appropriate by the National Assessment Governing Board in consultation with the Commissioner for Education Statistics” (Public Law 107-279).

Background

NAEP is the largest nationally representative and continuing assessment of what our nation’s elementary and secondary students know and can do. Since 1969, NAEP has been the country’s foremost resource for measuring student progress and identifying differences in student achievement across student subgroups. In a time of changing state standards and assessments, NAEP serves as a trusted resource for parents, teachers, principals, policymakers, and researchers to compare student achievement across states and select large urban districts. NAEP results allow the nation to understand where more work must be done to improve learning among all students.

For 25 years, the NAEP achievement levels (Basic, Proficient, and Advanced) have been a signature feature of NAEP results. While scale scores provide information about student achievement over time and across student groups, achievement levels reflect the extent to which student performance is “good enough,” in each subject and grade, relative to aspirational goals.
Since the Governing Board began setting standards in the early 1990s, achievement levels have become a standard part of score reporting for many other assessment programs in the US and abroad.

Governing Board Response

Overview

The Governing Board appreciates the thorough, deliberative process undertaken over the past two years by the National Academies of Science, Engineering, and Medicine and the expert members of the Committee on the Evaluation of NAEP Achievement Levels for Mathematics and Reading. The Governing Board is pleased that the report concludes that the achievement levels are a meaningful and important part of NAEP reporting. The report states that, “during their 24 years [the achievement levels] have acquired meaning for NAEP’s various audiences and stakeholders; they serve as stable benchmarks for monitoring achievement trends, and they are widely used to inform public discourse and policy decisions. Users regard them as a regular, permanent feature of the NAEP reports” (Edley & Koenig, 2016; page Sum-8). The Governing Board has reviewed the seven recommendations presented in the report and finds them reasonable and thoughtful. The report will inform the Board’s future efforts to set achievement levels and communicate the meaning of NAEP Basic, Proficient, and Advanced. The recommendations intersect with two Governing Board documents, the Strategic Vision and the achievement levels policy, described here.

On November 18, 2016, the Governing Board adopted a Strategic Vision (https://www.nagb.org/content/nagb/assets/documents/newsroom/press-releases/2016/nagb-strategic-vision.pdf) to guide the work of the Board through 2020, with an emphasis on innovating to enhance NAEP’s form and content and expanding NAEP’s dissemination and use. The Strategic Vision answers the question, “How can NAEP provide information about how our students are doing in the most innovative, informative, and impactful ways?” The Governing Board is pleased that several of the report recommendations are consistent with the Board’s own vision. The Governing Board is committed to measuring the progress of our nation’s students toward their acquisition of academic knowledge, skills, and abilities relevant to this contemporary era.

The Governing Board’s approach to setting achievement levels is articulated in a policy statement, “Developing Student Performance Levels for the National Assessment of Educational Progress” (https://www.nagb.org/content/nagb/assets/documents/policies/developing-student-performance.pdf). The policy was first adopted in 1990 and was subsequently revised in 1995,
with minor wording changes made in 2007. The report motivates the revision of this policy, to add clarity and intentionality to the setting and communication of NAEP achievement levels.

The seven recommendations and the Governing Board response comprise a significant research and outreach trajectory that the Governing Board can pursue over several years in conjunction with key partners. The Governing Board will implement these responses within resource constraints and in conjunction with the priorities of the Strategic Vision.

**Evaluating the Alignment of NAEP Achievement Level Descriptors**

**Recommendation #1:** Alignment among the frameworks, the item pools, the achievement-level descriptors, and the cut scores is fundamental to the validity of inferences about student achievement. In 2009, alignment was evaluated for all grades in reading and for grade 12 in mathematics, and changes were made to the achievement-level descriptors, as needed. Similar research is needed to evaluate alignment for the grade 4 and grade 8 mathematics assessments and to revise them as needed to ensure that they represent the knowledge and skills of students at each achievement level. Moreover, additional work to verify alignment for grade 4 reading and grade 12 mathematics is needed.

The report’s primary recommendation is to evaluate the alignment, and revise if needed, the achievement level descriptors for NAEP mathematics and reading assessments in grades 4, 8, and 12. The Governing Board intends to issue a procurement for conducting studies to achieve this goal. The Governing Board has periodically conducted studies to evaluate whether the achievement level descriptors in a given subject should be revised, based on their alignment with the NAEP framework, item pool, and cut scores. The Governing Board agrees that this is a good time to ensure that current NAEP mathematics and reading achievement level descriptors align with the knowledge and skills of students in each achievement level category. In conjunction with the response to Recommendation #3, the updated Board policy on NAEP achievement levels will address the larger issue of specifying a process and timeline for conducting regular recurring reviews of the achievement level descriptions in all subjects and grades.

The Governing Board agrees strongly with the recommendation that, while evaluating alignment of achievement level descriptors is timely, it is not necessary to consider changing the cut scores or beginning a new trend line at this time. The NAEP assessments are transitioning from paper-based to digital assessments in 2017, and current efforts are focused on ensuring comparability between 2015 and 2017 scores. The Governing Board articulated this in the 2015 Resolution on Maintaining NAEP Trends with the Transition to Digital-Based Assessments ([https://www.nagb.org/content/nagb/assets/documents/policies/resolution-on-trend-and-dba.pdf](https://www.nagb.org/content/nagb/assets/documents/policies/resolution-on-trend-and-dba.pdf)).

**Recommendation #2:** Once satisfactory alignment among the frameworks, the item pools, the achievement-level descriptors, and the cut scores in NAEP mathematics and reading has been
demonstrated, their designation as trial should be discontinued. This work should be completed and the results evaluated as stipulated by law: (20 U.S. Code 9622: National Assessment of Educational Progress: https://www.law.cornell.edu/uscode/text/20/9622 [September 2016]).

Ultimately, the Commissioner of Education Statistics is responsible for determining whether the “trial” designation is removed. The Governing Board is committed to providing the Commissioner with the information needed to make this determination in an expedient manner.

**Regular Recurring Reviews of the Achievement Level Descriptors**

**Recommendation #3:** To maintain the validity and usefulness of achievement levels, there should be regular recurring reviews of the achievement-level descriptors, with updates as needed, to ensure they reflect both the frameworks and the incorporation of those frameworks in NAEP assessments.

The Board’s current policy on NAEP achievement levels contains several principles and guidelines for setting achievement levels but does not address issues related to the continued use or reporting of achievement levels many years after they were established. The revised policy will seek to address this gap by including a statement of periodicity for conducting regular recurring reviews of the achievement level descriptors, with updates as needed, as called for in this recommendation. The Governing Board agrees that it is important to articulate a process and timeline for conducting regular reviews of the achievement level descriptors rather than performing such reviews on an ad hoc basis.

**Relationships Between NAEP Achievement Levels and External Measures**

**Recommendation #4:** Research is needed on the relationships between the NAEP achievement levels and concurrent or future performance on measures external to NAEP. Like the research that led to setting scale scores that represent academic preparedness for college, new research should focus on other measures of future performance, such as being on track for a college-ready high school diploma for 8th-grade students and readiness for middle school for 4th-grade students.

In addition to the extensive work that the Governing Board has conducted at grade 12 to relate NAEP mathematics and reading results to academic preparedness for college, the Governing Board has begun research at grade 8 with statistical linking studies of NAEP mathematics and reading and the ACT Explore assessments in those subjects. This work was published while the evaluation was in process and was not included in the Committee’s deliberations. Additional studies in NAEP mathematics and reading at grades 4 and 8 are beginning under contract to the National Center for Education Statistics (NCES). The Governing Board’s Strategic Vision includes an explicit goal to increase opportunities for connecting NAEP to other national and
international assessments and data. Just as the Board’s previous research related grade 12 NAEP results in mathematics and reading to students’ academic preparedness for college, the Governing Board anticipates that additional linkages with external measures will help connect the NAEP achievement levels and scale scores to other meaningful real-world indicators of current and future performance.

**Interpretations and Uses of NAEP Achievement Levels**

Recommendation #5: Research is needed to articulate the intended interpretations and uses of the achievement levels and collect validity evidence to support these interpretations and uses. In addition, research to identify the actual interpretations and uses commonly made by NAEP’s various audiences and evaluate the validity of each of them. This information should be communicated to users with clear guidance on substantiated and unsubstantiated interpretations.

The Governing Board’s Strategic Vision emphasizes improving the use and dissemination of NAEP results, and the Board’s work in this area will include achievement levels. The Governing Board recognizes that clarity and meaning of NAEP achievement levels (and scale scores) are of utmost importance. The Governing Board will issue a procurement to conduct research to better understand how various audiences have used and interpreted NAEP results (including achievement levels). The Governing Board will work collaboratively with NCES to provide further guidance and outreach about appropriate and inappropriate uses of NAEP achievement levels.

**Guidance for Inferences Made with Achievement Levels versus Scale Scores**

Recommendation #6: Guidance is needed to help users determine inferences that are best made with achievement levels and those best made with scale score statistics. Such guidance should be incorporated in every report that includes achievement levels.

The Governing Board understands that improper uses of achievement level statistics are widespread in the public domain and extend far beyond the use of NAEP data. Reports by the Governing Board and NCES have modeled appropriate use of NAEP data and will continue to do so. This recommendation is also consistent with the goal of the Strategic Vision to improve the dissemination and use of NAEP results. The Governing Board will continue to work with NCES and follow current research to provide guidance about inferences that are best made with achievement levels and those best made with scale score statistics.
Regular Cycle for Considering Desirability of Conducting a New Standard Setting

Recommendation #7: NAEP should implement a regular cycle for considering the desirability of conducting a new standard setting. Factors to consider include, but are not limited to: substantive changes in the constructs, item types, or frameworks; innovations in the modality for administering assessments; advances in standard setting methodologies; and changes in the policy environment for using NAEP results. These factors should be weighed against the downsides of interrupting the trend data and information.

When the Board's achievement levels policy was first created and revised in the 1990s, the Board was setting standards in each subject and grade for the first time and had not yet considered the need or timeline for re-setting standards. To address this recommendation, the Governing Board will update the policy to be more explicit about conditions that require a new standard setting.

Board’s Commitment

The Governing Board remains committed to its congressional mandate to set “appropriate student achievement levels” for the National Assessment of Educational Progress. The Board appreciates the report’s affirmation that NAEP achievement levels have been set thoughtfully and carefully, consistent with professional guidelines for standard setting, and based on extensive technical advice from respected psychometricians and measurement specialists. The Board also takes seriously the charge to develop the current achievement levels through a national consensus approach, involving large numbers of knowledgeable teachers, curriculum specialists, business leaders, and members of the general public throughout the process. This is only fitting given the Governing Board’s own congressionally mandated membership that explicitly includes representatives from these stakeholder groups.

The Governing Board remains committed to improving the process of setting and communicating achievement levels. The Governing Board is grateful for the report recommendations that will advance these aims.

Reference

## Glossary of Acronyms and Other Terms

The following acronyms and terms are commonly used in the work of the National Assessment Governing Board.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AASA</td>
<td>American Association of School Administrators</td>
</tr>
<tr>
<td>ACT</td>
<td>Formerly American College Testing</td>
</tr>
<tr>
<td>ADC</td>
<td>Assessment Development Committee (Board Committee responsible for test development on all NAEP subjects)</td>
</tr>
<tr>
<td>AERA</td>
<td>American Educational Research Association</td>
</tr>
<tr>
<td>AFT</td>
<td>American Federation of Teachers</td>
</tr>
<tr>
<td>AIR</td>
<td>American Institutes for Research</td>
</tr>
<tr>
<td>ALDs</td>
<td>Achievement Level Descriptions</td>
</tr>
<tr>
<td>ALS</td>
<td>Achievement Levels Setting</td>
</tr>
<tr>
<td>ARRA</td>
<td>American Recovery and Reinvestment Act of 2009</td>
</tr>
<tr>
<td>AYP</td>
<td>Adequate Yearly Progress (From the No Child Left Behind Act)</td>
</tr>
<tr>
<td>BOTA</td>
<td>Board on Testing and Assessment, National Academy of Sciences</td>
</tr>
<tr>
<td>CCSS</td>
<td>Common Core State Standards</td>
</tr>
<tr>
<td>CCSSO</td>
<td>Council of Chief State School Officers</td>
</tr>
<tr>
<td>CGCS</td>
<td>Council of the Great City Schools</td>
</tr>
<tr>
<td>COSDAM</td>
<td>Committee on Standards, Design and Methodology (Board committee responsible for technical issues)</td>
</tr>
<tr>
<td>CRESST</td>
<td>Center for Research on Evaluation, Standards, and Student Testing (Research Center at UCLA)</td>
</tr>
<tr>
<td>DAC</td>
<td>Design and Analysis Committee (Advisory panel to ETS on technical issues in NAEP operations)</td>
</tr>
<tr>
<td>ECS</td>
<td>Education Commission of the States (First NAEP contractor and organization supporting state policy leaders)</td>
</tr>
<tr>
<td>EIMAC</td>
<td>Education Information Management Advisory Consortium (Advisory committee to CCSSO, mostly state testing directors)</td>
</tr>
<tr>
<td>ELs or ELLs</td>
<td>English Learners or English Language Learner (Pronounced &quot;Ls&quot;; formerly called Limited English Proficient or LEP)</td>
</tr>
<tr>
<td>ELPA</td>
<td>English Language Proficiency Assessment (Also ELPA21)</td>
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<tr>
<td>EPIC</td>
<td>Education Policy Improvement Center</td>
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<tr>
<td>ESEA</td>
<td>Elementary and Secondary Education Act</td>
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<tr>
<td>ETS</td>
<td>Educational Testing Service</td>
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<tr>
<td>FAR</td>
<td>Federal Acquisition Regulations</td>
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<tr>
<td>GAO</td>
<td>Government Accountability Office</td>
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<tr>
<td>GPO</td>
<td>Government Printing Office</td>
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<tr>
<td>GSA</td>
<td>General Services Administration</td>
</tr>
<tr>
<td>HSTS</td>
<td>High School Transcript Study (A special NAEP data collection)</td>
</tr>
<tr>
<td>IEP</td>
<td>Individualized Education Plan (A required document under the Individuals with Disabilities Education Act, which specifies learning objectives for an individual student found with a disability)</td>
</tr>
<tr>
<td>IES</td>
<td>Institute of Education Sciences (The Department of Education office in which NCES is located. The Director of IES is an ex-officio member of the Governing Board.)</td>
</tr>
<tr>
<td>IRA</td>
<td>International Reading Association</td>
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</tr>
</tbody>
</table>
| IRT | Item Response Theory  
* (A theory for design, analysis, and scoring of tests) |
| KaSA | Knowledge and Skills Appropriate  
* (A series of NAEP research studies to improve measurement precision) |
| KSA | Knowledge, Skill, and/or Ability  
* (A statement describing a subset of academic content) |
| LEP | Limited English Proficient  
* (Term formerly used for an English Language Learner) |
| LTT | Long Term Trend Assessment  
* (Series of NAEP tests that began in the early 1970's) |
| MST | Multi-stage Testing  
* (A testing format where subsets of test items are presented to students based on item difficulty and student performance) |
| NAE | National Academy of Education |
| NAEP | National Assessment of Educational Progress  
* (Pronounced "nape") |
| NAESP | National Association of Elementary School Principals |
| NAGB | National Assessment Governing Board  
* (Pronounced "nag bee") |
| NAS | National Academy of Sciences |
| NASBE | National Association of State Boards of Education |
| NASSP | National Association of Secondary School Principals |
| The Nation’s Report Card | Alternate reference for NAEP assessments |
| NCES | National Center for Education Statistics  
* (Project office for NAEP in the U.S. Department of Education and IES) |
| NCLB | No Child Left Behind Act of 2001 |
| NCME | National Council on Measurement in Education |
| NCTE | National Council of Teachers of English |
| NCTM | National Council of Teachers of Mathematics |
| NEA | National Education Association |
| NEA | National Endowment for the Arts |
| NEH | National Endowment for the Humanities |
| NGSS | Next Generation Science Standards |
| NRC | National Research Council |
| NSBA | National School Boards Association |
| NSLP | National School Lunch Program |
| NVS | NAEP Validity Studies Panel |
| OGC | Office of the General Counsel  
* (in the U.S. Department of Education) |
| OMB | Office of Management and Budget |
| PARCC | Partnership for Assessment of Readiness for College and Careers |
| PIRLS | Progress in International Reading Literacy Study |
| PISA | Program for International Student Assessment |
| POC | Principal Operating Components  
* (Divisions of the U.S. Department of Education) |
<p>| PTA | Parent Teacher Association |</p>
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>Reporting and Dissemination Committee (Board Committee responsible for NAEP reporting issues)</td>
</tr>
<tr>
<td>RFP</td>
<td>Request for Proposals</td>
</tr>
<tr>
<td>RP</td>
<td>Response probability (probability of correct response on a test question)</td>
</tr>
<tr>
<td>RTT</td>
<td>Race to the Top (also referred to as RTTT)</td>
</tr>
<tr>
<td>SBAC</td>
<td>SMARTER Balanced Assessment Consortium</td>
</tr>
<tr>
<td>SD</td>
<td>Students with Disabilities</td>
</tr>
<tr>
<td>SES</td>
<td>Socio-economic Status</td>
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<tr>
<td>TBA</td>
<td>Technology-based Assessment</td>
</tr>
<tr>
<td>TEL</td>
<td>Technology and Engineering Literacy (A content area assessed by NAEP)</td>
</tr>
<tr>
<td>The Department</td>
<td>United States Department of Education</td>
</tr>
<tr>
<td>The Secretary</td>
<td>Secretary of Education (Honorable Arne Duncan during the Obama administration)</td>
</tr>
<tr>
<td>TIMSS</td>
<td>Trends in International Mathematics and Science Study</td>
</tr>
<tr>
<td>TUDA</td>
<td>Trial Urban District Assessment (NAEP component that measures students in large urban districts)</td>
</tr>
<tr>
<td>DATE AND TIME</td>
<td>EVENT</td>
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<tr>
<td>---------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Thursday, May 17</td>
<td>School Visit</td>
</tr>
<tr>
<td>8:30 am - 2:30 pm</td>
<td></td>
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<tr>
<td>Thursday, May 17</td>
<td>Ad Hoc Committee on Measures of Postsecondary Preparedness</td>
</tr>
<tr>
<td>3:00 – 5:00 pm</td>
<td></td>
</tr>
<tr>
<td>Thursday, May 17</td>
<td>Executive Committee</td>
</tr>
<tr>
<td>5:15 – 6:00 pm</td>
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<tr>
<td>Thursday, May 17</td>
<td>Informal Board Dinner</td>
</tr>
<tr>
<td>6:30 – 8:30 pm</td>
<td></td>
</tr>
<tr>
<td>Friday, May 18</td>
<td>Morning Session</td>
</tr>
<tr>
<td>8:30 – 10:15 am</td>
<td>Committee Meetings</td>
</tr>
<tr>
<td></td>
<td>Working Lunch</td>
</tr>
<tr>
<td></td>
<td>1:15 – 2:30 pm</td>
</tr>
<tr>
<td>Friday, May 18</td>
<td>Afternoon Session</td>
</tr>
<tr>
<td>2:30 – 5:00 pm</td>
<td>Full Board Meeting General Session</td>
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<tr>
<td>Friday, May 18</td>
<td>Board Outreach Dinner</td>
</tr>
<tr>
<td>6:00 – 9:00 pm</td>
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<tr>
<td>Saturday, May 19</td>
<td>Nominations Committee</td>
</tr>
<tr>
<td>7:30 – 8:15 am</td>
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</tr>
<tr>
<td>Saturday, May 19</td>
<td>Full Board Meeting</td>
</tr>
<tr>
<td>8:30 – 10:45 am</td>
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</tbody>
</table>
Ground Transportation Options
Embassy Suites Montgomery Hotel and Conference Center
300 Tallapoosa Street, Montgomery, AL 36104
(334) 269-5055

Uber or Lyft
If you plan to use Uber, Lyft or another transportation network company (TNC) service, your ride will pick you up on the Arrivals Level in the passenger pick up area.

Shuttle Service
The hotel offers shuttle service to and from the Montgomery Regional Airport (MGM). The one-way fare is $15.00. Contact the hotel directly at (334) 269-5055 to make a reservation.

Taxi Service
Several taxi companies provide service from Montgomery Regional Airport (MGM) to the Embassy Suites Hotel and Conference Center. The one-way trip costs approximately $20 and travel time is approximately 15 minutes. Taxi stands are located just outside baggage claim during airport hours of operation.

On Time Taxi
(334) 505-1189
http://ontimetaxi.co/

Wilson Cab
(334) 306-3351
http://wilsoncab.com/

Parking
The hotel offers self and valet parking in their on-site parking garage. The rates are $16 for self- and $21 for valet service.