

National Assessment of Educational Progress (NAEP)

Technology and Engineering Literacy Framework and Item Specifications for the 2014 NAEP

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Focus of the Framework

- **Technology** is any modification of the natural or designed world done to fulfill human needs or desires.
- **The Framework focuses on** the capacity to use, understand, and evaluate technology as well as to understand technological principles and strategies needed to develop solutions and achieve goals.
- **The Framework comprises** three areas: Technology and Society, Design and Systems, and Information and Communication Technology.

Broad-Based Input

- Diverse Steering and Planning Committees

Steering Co-Chairs

Don Knezek, ISTE
Senta Raizen, WestEd

Planning Co-Chairs

Edys Quellmalz, WestEd
Cary Sneider, Portland St Univ

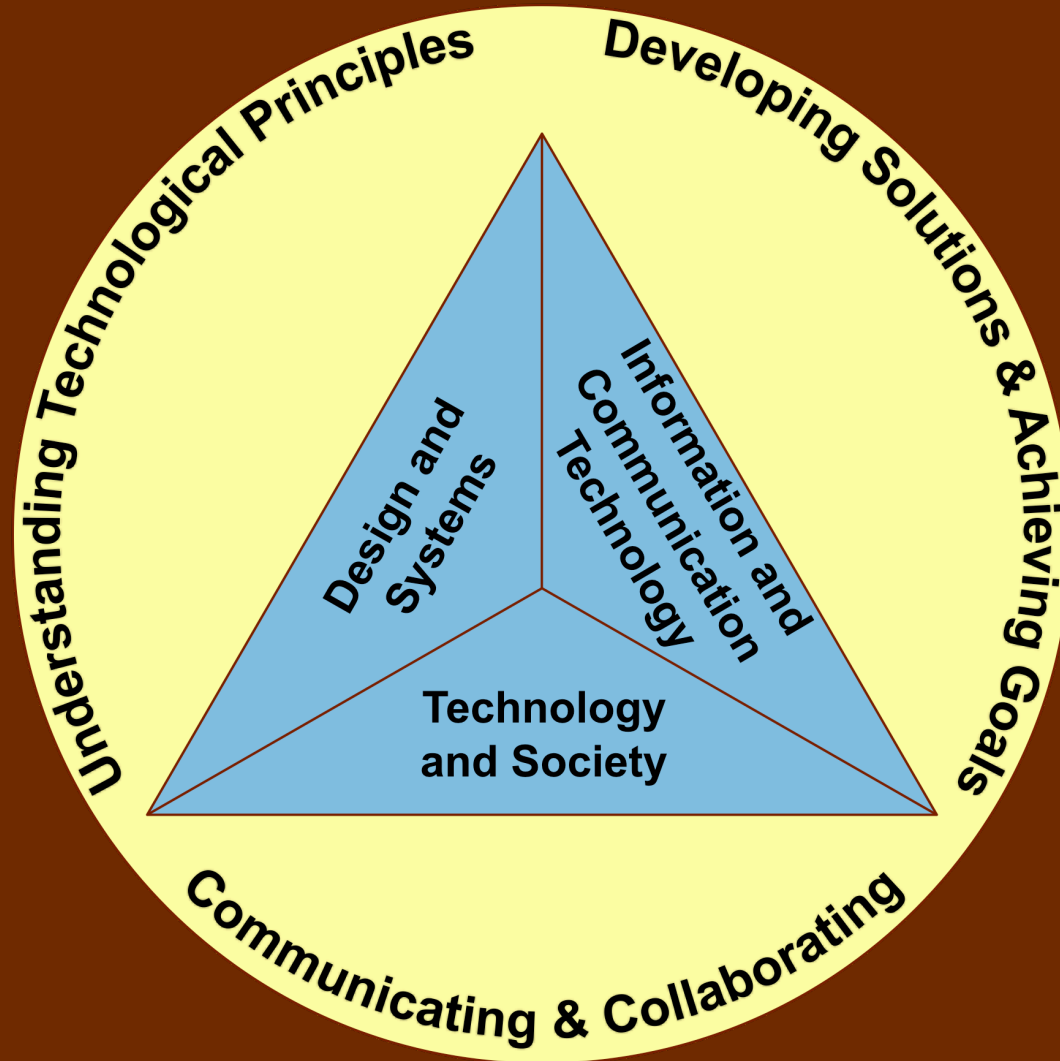
- Stakeholders include technology specialists, engineers, teachers, state education officials, and the public

*20 formal presentations,
with over 2200 participants*

The Three Major Assessment Areas

Technology & Society	Design & Systems	Information & Communication Technology (ICT)
<p>A. Interaction of Technology and Humans</p> <p>B. Effects of Technology on the Natural World</p> <p>C. Effects of Technology on the World of Information and Knowledge</p> <p>D. Ethics, Equity and Responsibility</p>	<p>A. Nature of Technology</p> <p>B. Engineering Design</p> <p>C. Systems Thinking</p> <p>D. Maintenance and Troubleshooting</p>	<p>A. Construction and Exchange of Ideas and Solutions</p> <p>B. Information Research</p> <p>C. Investigation of Problems</p> <p>D. Acknowledgement of Ideas and Information</p> <p>E. Selection and Use of Digital Tools</p>

Assessment Areas and Practices



Developments Since 2009 CCSSO

Title of the Assessment:

Technology and Engineering Literacy

Year of Probe:

2014

Grade level:

Grade 8

Specifications for Item Development

Relationship of the Framework and Specifications

Framework Chapter	Specifications Chapter
1. Overview	1. Overview
2. Areas of Technology and Engineering Literacy	2. Areas of Technology and Engineering Literacy
3. Practices and Contexts for Technology and Engineering Literacy	3. Practices and Contexts for Technology and Engineering Literacy
4. Overview of the Assessment Design	4. Overview of the Assessment Design and Specifications for Item Design
	5. Assessment Design and Student Diversity
5. Reporting Results of the NAEP Technology and Engineering Literacy Assessment	6. Scoring and Reporting

Additional Content in the Specifications

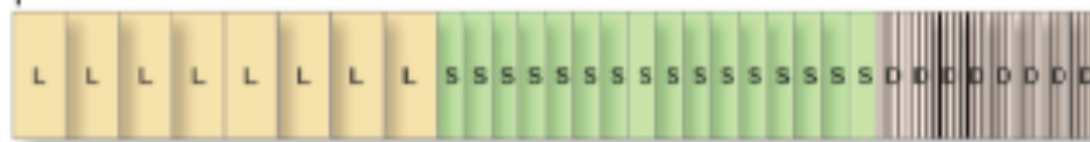
- Appendix I: Development of Sample Items for the NAEP Technology and Engineering Literacy Assessment
- An accompanying CD with recorded movie segments to illustrate the interactive assessment items shown in static images

Specifications Chapter 4: Overview of the Assessment Design and Specifications for Item Design

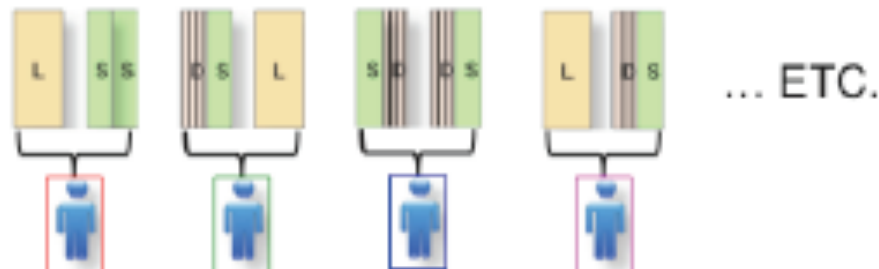
- Types of Tasks and Items
 - Scenario-based Assessment Sets
 - Discrete Item Sets
- Examples of the Response Types Used in the Assessment Sets
 - Constructed Response (Short and Extended)
 - Selected Response
- Ways of Measuring Student Responses
 - Direct Responses
 - Pattern-tracking Measures

Specifications Chapter 4: Overview of the Assessment Design and Specifications for Item Design (Cont.)

- Scenario Development
 - Shells and examples of long and short scenarios at different grade levels
- Discrete Item Development
 - Examples of static and interactive items at different grade levels
- Cross-checking with Other NAEP Content Areas
- Balance of the Assessment by Major Assessment Area, Practice, Set Type, and Response Type



Items are placed into test blocks of 25 mins



Legend:



Long Scenario

Approx. 25 min
Many selected response, short constructed response, and long constructed response



Short Scenario

Approx. 12 min
Smaller number of selected response, and short constructed response.



Discrete items

Approx. 12 min
Stand-alone items **not** in a scenario.
May be selected response or short constructed response.

Sample of Movies on CD

- Scenarios
 - Chortlers
(Ripley 2009)
 - Video Games and Violence
(Australian MCEECDYA, 2008)
 - Fire Fighter Training – Forces and Motion
(WestEd 2010)
- Discrete Item
 - Water Cycle
(Minnesota Department of Education, 2009)

Specifications Chapter 5: Assessment Design and Student Diversity

- The Assessment Delivery System
 - The System that Administers the Items and Collects the Data for Scoring
- Accessibility of the Assessment
 - Overview of the Concept of Universal Design
 - Rationale for Maximizing Accessibility on the Assessment
 - Test Delivery Considerations
 - Item Content and Delivery Considerations
 - Component Content and Delivery Considerations

Chapter 5: Assessment Design and Student Diversity (Cont.)

- Students with Disabilities: Assessment Issues and Recommendations
 - Typical NAEP Accommodations for Students with Disabilities
- English Language Learners: Assessment Issues and Recommendations
 - Test Translation, Accommodations, and Scoring
- Test Development Processes
 - Who Should be in the Test Development Team
 - Review, Tryout and Pilot Testing Processes

Specifications Chapter 6: Scoring and Reporting

- Overview of the Scoring Processes
 - The four process architecture (Activity selection, Presentation, Response Processing, Scoring)
- Measurement Methods
 - Limitations of current methods
 - Need for increased range of methods
 - Discussion of potential measurement models

Specifications Chapter 6: Scoring and Reporting (Cont.)

- How NAEP Results are Reported
- Reporting Scale Scores and Achievement Levels
- Reporting Background Variables
 - Outlines the use of background variables
 - These are still under development
- Uses of NAEP Reporting

For More Information:

NAEP Technology and Engineering
Literacy Project

www.naeptech2014.org

National Assessment Governing Board

www.nagb.org

NAEP

nces.ed.gov/NATIONSREPORTCARD