Tuesday, December 15

4:30-6:30 pm Reception at NAS Building West Court
(for arriving participants and members of the committee on assessing competencies)

Wednesday, December 16

NAS 120 (main room)

NAS Members Room (overflow room)

8:30-9:15 Welcome and Introductions
- Heidi Schweingruber, Director, Board on Science Education
- Joan Ferrini-Mundy, Assistant Director for Education and Human Resources, National Science Foundation (NSF)

9:15-10:30 Session 1: Exploring the Relationships of Cognitive, Intrapersonal and Interpersonal Competencies to STEM Learning and Persistence
Moderator: Susan Singer, NSF Division of Undergraduate Education

- Christine Massey, University of Pennsylvania
  - Reflections on Education for Life and Work
- Gale Sinatra, University of Southern California
  - The role of motivation and emotion in teaching and learning about controversial topics
- Joan Herman, CRESST, UCLA
  - Reflections on Assessing 21st Century Skills: A Workshop Summary
  - Overview of Study on Assessing Intrapersonal and Interpersonal Competencies

10:30-10:45 Break

10:45-12:00 Session 2: Defining and Assessing Competencies
Moderator: Gregg Solomon, NSF Division of Research on Learning
Developing Definitions and Assessment Methods

- **Patrick Kyllonen, ETS**
  - Preliminary taxonomy of competencies from *Education for Life and Work*
  - Aligning Competency Types with Measurement Methods

A Research and Development Agenda and a Repository of Instruments

- **Brian Stecher and Laura Hamilton, RAND**

12:00-1:00 Lunch

1:00-2:30 Session 3: Funder Interest and Activity in Assessing Competencies
Moderator: **Joan Herman, CRESST, UCLA**

NSF Research Support: Findings from the NSF Portfolio Review

- **Susan Singer, NSF Division of Undergraduate Education**
- **Evan Heit, NSF Division of Research on Learning**

Other Funders’ Research Support: Findings from the Funder Landscape survey.

- **Marc Chun, The William and Flora Hewlett Foundation**

Institute of Educational Sciences Research Support: Portfolio Overview

- **Thomas Brock, Institute of Education Sciences, U.S. Department of Education**

National Institute of Child Health and Development Research Support

- **James Griffin, Child Development and Behavior Branch, National Institute for Child Health and Human Development**

2:30-2:45 Break (move to parallel sessions at end of break)

2:45-4:45 Session 4: A Sampling of NSF Projects (audience attends parallel sessions)

2:45-3:45 Parallel Panel Sessions

Panel 1: **Gender, Diversity, and Competencies in STEM Pathways**, Board Room
Moderator: **Margaret Hilton, Board on Science Education**

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<td><strong>Nicole Else-Quest</strong>,</td>
<td>Gender-ethnic identification and the development of STEM</td>
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Panel 2: Measuring Key Competencies, Room 120
Moderator: Gül E. Kremer, NSF Division of Undergraduate Education

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Panel 3: Collaboration and Communication Competencies, Members’ Room
Moderator: Brian Stecher, RAND

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| **Julie Cwikla, University of Southern Mississippi** | Early fraction learning: Links with prosociality and self and other perspective taking  
| **Danielle McNamara, Arizona State University** | Modeling social interaction and STEM learning  
| **Bradley Barker, University of Nebraska-Lincoln** | National robotics in 4-H: Workforce skills for the 21st century  
| **Paul Horwitz, Concord Consortium** | Teaching teamwork: Electronics instruction in a collaborative environment  
| **Matthew Ohland, Purdue University** | Optimizing student team skill development using evidence-based strategies  
| **Charles Wallace, Michigan Technological University** | Agile communicators: Preparing students for communication-intensive software development through inquiry, critique and reflection  

Panel 4: Key Intrapersonal Competencies (e.g., motivation, mindsets), Room 250
Moderator: Heidi Schweingruber, Board on Science Education

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| **Sheri Berkeley, George Mason University** | Self-regulation of science learning in the context of educational game creation: A study of middle school students with learning disabilities  
| **Xueli Wang, University of Wisconsin** | Expanding STEM talent through upward transfer: Factors influencing transfer in STEM fields of study from two-year to four-year institutions (including motivational beliefs)  
| **Xaiodong Lin, Teachers College, Columbia University** | Developing students’ growth mindsets to promote science learning (K-12)  
| **Lee Shumow, Northern Illinois University** | Incremental mindset and utility for science learning and engagement (I-MUScLE): A quasi-experimental study of the impacts of targeted classroom treatments (K-12) |

3:45-4:30 **Small Group Discussions, Same 4 Rooms** — 3 to 4 small groups in each room led by pairs of panel speakers

4:30 **Break** (return to plenary room at end of break)

4:45-5:30 **Session 5: Next Steps, Room 120** (main room) **Members Room** (overflow)
   **Moderator**: Christine Massey, University of Pennsylvania

   - Reflections on the Day: Key themes and unanswered questions
     *Fred Oswald, Rice University*
     *Tabbye Chavous, University of Michigan*

   - Questions and reflections from the audience

   - Plans for Moving Forward

5:30 **Adjourn Symposium**