THE NATIONAL RESEARCH COUNCIL
BOARD ON SCIENCE EDUCATION & BOARD ON TESTING AND ASSESSMENT
STEERING COMMITTEE ON HIGHLY SUCCESSFUL SCHOOLS OR PROGRAMS FOR K-12 STEM EDUCATION

WORKSHOP ON SUCCESSFUL STEM EDUCATION IN K-12 SCHOOLS
MAY 10-12, 2011
20 F CONFERENCE CENTER
20 F STREET, NW
Washington, DC 20001

Workshop Goals

1. Describe four types of K-12 schools that can support successful education in science, technology, engineering, and/or mathematics (STEM):
    a. Elite or selective STEM-focused schools.
    b. Inclusive STEM-focused schools (those with no admissions criteria).
    c. STEM-focused career and technical education schools or programs.
    d. Effective STEM education in comprehensive, non-STEM focused schools.
2. Draw on existing data and research to determine the effectiveness these school types.
3. Summarize existing research on various elements that constitute and contribute to effective K-12 education in the STEM disciplines and describe how the implementation of these elements can contribute to highly successful STEM schools.

Tuesday, May 10
20 F CONFERENCE CENTER
Conference Room B

CLOSED SESSION

8:00 a.m.

OPEN SESSION

8:30 a.m. **Welcome**

Robert Hauser, National Research Council
Joan Ferrini-Mundy, National Science Foundation
Norman Augustine, Lockheed Martin (ret.)

9:00 a.m. **Workshop Overview and Context**

This section of the workshop will describe how the committee framed the issues related to the study charge.

Speakers: Adam Gamoran (University of Wisconsin-Madison), steering committee chair
Barbara Means (SRI International), steering committee member

9:15 a.m. **Successful Education in the STEM Disciplines: An Examination of Four School Types**

Session Moderator: Max McGee (Illinois Mathematics and Science Academy), steering committee member

This section of the workshop will include presentations on four types of schools. For each school type, the author will describe the range of school models and goals, the range of outcomes the schools seek to influence and evidence of their effectiveness, strengths and weaknesses, and factors that influence their success. A leader from each school type will respond to the research papers.

9:15 a.m. ***Selective STEM Schools***
Presenters: Robert Tai (University of Virginia) and Rena Subotnik (American Psychological Association)

Respondent: Chancellor Todd Roberts (North Carolina School of Science and Mathematics, Durham, North Carolina)

Discussion and Q&A

10:15 a.m. ***Inclusive STEM Schools***
Presenter: Viki Young (SRI International)

Respondent: Principal Darryl Williams (Montgomery Blair High School, Silver Spring, Maryland)

Discussion and Q&A

11:15 a.m. ***Break***

11:30 a.m. ***STEM-Focused Career and Technical Education***
Presenter: James Stone (National Research Center for Career and Technical Education)

Respondent: Jill Siler (Lake Travis High School, Austin, Texas)

Discussion and Q&A

12:30 p.m. ***Continue discussions over lunch***

1:30 p.m. ***Effective STEM Education in non-STEM Focused Schools***

Presenter: William Schmidt (Michigan State University)

Respondent: Principal Janet Elder (PS #28, Jersey City, New Jersey)

Discussion and Q&A

2:30 p.m. **Using State Databases to Identify Schools Successful in STEM: Florida and North Carolina**

Session Moderator: Julian Betts (University of California, San Diego), steering committee member

This section of the workshop will feature quantitative analyses of student-level data from state administrative databases. The analyses will explore the relationships between school-level inputs and STEM outcomes.

Presenter: Michael Hansen (Urban Institute)

Q&A and Discussion

3:15 p.m. **Break**

3:30 p.m. **Wrap-Up of Day 1, Overview of Day 2**

The committee, speakers, and audience will discuss the following questions:

- What, collectively, does this research tell us about schools that deliver effective education in the STEM disciplines?
- What are the most important findings related to each school type, and why? What are the policy implications of those findings?
- What are the gaps in our knowledge, and what merits additional study?

4:30 p.m. **Adjourn Open Session**

CLOSED SESSION

4:30 p.m. - 8:30 p.m.

Wednesday, May 11
20 F CONFERENCE CENTER
Conference Rooms A and B

CLOSED SESSION

8:00 a.m.

OPEN SESSION

8:30 a.m. **Welcome & Overview**
Adam Gamoran (University of Wisconsin-Madison), steering committee chair

8:45 a.m. **Practices to Support Effective Education in the STEM Disciplines**

Session Moderator: Jerry Gollub (Haverford College), steering committee member

This section of the workshop will synthesize the research on effective practices in the STEM disciplines. Presenters will describe how implementing these practices can help to create highly successful schools, and illuminate some challenges associated with implementation.

8:45 a.m. ***Effective Science Instruction***
Presenter: Richard Duschl (Pennsylvania State University)

Presenter: Okhee Lee (University of Miami)

Q&A and Discussion

9:45 a.m. ***Break***

10:00 a.m. ***Effective Mathematics Instruction***
Presenter: Jere Confrey (North Carolina State University)

Presenter: Na'ilah Suad Nasir (University of California, Berkeley)

Q&A and Discussion

11:00 a.m. ***Assessment to Improve Instruction in the STEM Disciplines***
Presenter: James Minstrell (FACET Innovations)

Q&A and Discussion

11:45 a.m. **Continue discussions over lunch**

12:45 p.m. **Conditions to Promote Schools that are Successful in STEM**
Session Moderator: Jerry Valadez (California State University, Fresno), steering committee member

This section will focus on some vital elements of successful schools.

12:45 p.m. ***Supports for Teachers***
Presenter: Suzanne Wilson (Michigan State University)

Q&A and Discussion

1:30 p.m. ***School Climate/Organization***
Presenter: Elaine Allensworth (Chicago Consortium of School Research)

Respondent: Milbrey McLaughlin (Stanford University), steering committee member

Q&A and Discussion

2:15 p.m. ***Partnerships to Enhance STEM Education: A Panel Discussion***
Panelists:
Martin Gartzman (University of Chicago)
Vanessa Lujan (Lawrence Hall of Science)
Linda Rosen (Change the Equation)

Q&A and Discussion

3:00 p.m. **Break**

3:15 p.m. **Looking Ahead: The Next Generation of Standards and Assessments**
Session Moderator: Steve Schneider (WestEd), steering committee member

Committee members, workshop presenters, and audience members will discuss the implications of the information presented in the workshop for implementing the next generation of standards and assessments in the STEM disciplines.

4:00 p.m. **Bringing it All Together**

The final session will synthesize the major messages from the workshop, including policy implications and areas for future research.

Speakers: Workshop steering committee members
Subra Suresh, National Science Foundation (tentative)

4:30 p.m. **Adjourn Open Session**

CLOSED SESSION

4:30 p.m. - 8:30 p.m.

Thursday, May 12

CLOSED SESSION

8:30 a.m. – 12:00 p.m.