

FINAL APPROVED

Governor's Task Force on K-12 Science, Technology, Engineering and Math Education (STEM)

September 29, 2015

Executive Council Chamber, office of Gov. Maggie Hassan, Concord, NH

Task Force Members in Attendance: Ross Gittell, Chairman; Susan D'Agostino, Beau Beaudoin, Brian Blake, Katie Brissette, Barbara Couch, Chris Dodge, Eric Feldborg, Robert Hallowell, Joseph Helble, Jeremy Hitchcock, Sally Jean, Todd Lamarque, Leslie McRobie, Lauren Provost and Annie Wallace.

Unable to Attend: Joyce Craig; P.T. (Vasu) Vasudevan

Others present: Tom Hassan, Brittany Weaver (Policy Advisor to the Governor), Tabitha Dunn (Campus Compact NH); Bill Hinton (Hinton Technical Services); Tim Osmer (NH Dept. of Agriculture); Patrick P (America Rising) and Stacey Weigler (NH PTA).

- I. Welcome by Governor Maggie Hassan
The Governor thanked the Task Force for agreeing to serve and reiterated the goals of the Task Force which are to implement or support implementation of the recommendations from the Governor's K-12 STEM Education Task Force Final Report, released January 2015. (This Task Force fulfilled its mission to develop recommendations for modernizing STEM K-12 education. The Task Force was disbanded with the Governor's thanks on November 2014 after submitting its final report). Copies of the Task Force report are available on the Governor's website.

The Governor underscored the importance role the new Task Force will play to help achieve both short- and long-term STEM education goals for the future of New Hampshire.
- II. Call to order and welcome by Chair Ross Gittell who reviewed meeting agenda
- III. General announcements: Dr. Brian Blake (Superintendent of schools, SAU #17) provided copies of the National Boy Scouts' STEM Scouts curriculum kits (more information is available at www.nhscouting.org); Katie Brissette, Deputy Director, SPARK, provided flyers for *Transforming Tomorrow's Workforce Today: A First in the Early Learning Nation Event*, scheduled October 5, 2015 (more information is available at info@earlylearningnh.org); Dr. Sally Jean (Professor, Keene State College) announced that the New Hampshire Science Teachers Association will hold a panel discussion on the Governor's STEM K-12 Education Task Force report on Sunday, November 1st from 1-3pm (more information is available by contacting Dr. Jean at sjean@keene.edu).
- IV. Prioritization of recommendations for implementation in 2015-2016.

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The chairman reviewed the three major areas of the Task Force Final Report (January 2015) which will serve as the framework for future work: Foundations of STEM, Inspiring Students and Empowering Teachers. In addition, he noted that a fourth area was added, Communications and Engagement, which will be important to keeping citizens of New Hampshire updated on STEM activities and Task Force work.

- Some of the topline issues to emerge from the Task Force work recommendations include:

GENERAL:

- Determine reasonable goals for 2015-2016 and expectations beyond 2016.
- Balance between short- and long-term goals
- Focus on communications and public engagement to support working group activities to ensure citizens of New Hampshire are kept informed
- Consider an hosting activity from each category in each of the 5 regions of the state
- Look for ways to engage business in the work of the Task Force
- With influx of STEM K-12 curriculum kits now available to school districts, consider asking the Department of Education to review and comment on kits received in the future
- Maintain strong connection between K-12 STEM and higher education in Task Force plans
- Consider Girls in STEM as a cross cutting area and include in all recommendations

FOUNDATIONS

- FOCUSING ON EARLY LEARNING: pre-K -3 is especially important because research has shown that young children need to develop essential understandings of math. Many students learn to hate math by as early as middle school – due to part to a lack of this essential understanding of math and opportunities to learn math through practical applications of hands-on learning. This is particularly important to developing young girl's interest in STEM – ensuring that they have a strong foundation in math at an early age.
- RETHINKING OUR MATH PATHWAYS to expand new areas of coding and statistics as part of STEM-literacy. Coding, contrary to popular understanding, is more about developing critical thinking and logical approaches to problem-solving than just about learning a coding language. But we shouldn't forget about computer science. On the contrary, we need to integrate it into the study of math, science and engineering courses. Throughout the US, coding camps, competitions and projects aimed at girls from elementary school to high school have been showing promising results by boosting not only their skills in STEM subjects but their self-confidence.

INSPIRING STUDENTS

- CREATE STEM LEARNING PATHWAYS: to think about STEM as a continuous learning process from pre-K through high school, college and professional certification and graduate school. The Task Force plans to investigate the role of Individual Learning Plans for STEM literacy, so that students

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begin to explore their interests and career opportunities at middle school. Research tells us that by age 12 most students have a strong idea of what careers interest them but many lack a basic understanding of preparation for their career interests.

- RETHINKING THE LEARNING PROCESS: STEM subjects have traditionally been taught more conceptually than as hands-on learning processes. The Task Force is advocating for more project-based, hands-on learning which is captured in the "3 Cs" – challenges (problem solving), competitions (like FIRST) and capstones (independent supervised research projects for final year in high school and possibly middle school).
- RETHINKING CAREER AND TECHNICAL EDUCATION IN NH: Advocates of CTE education suggest that we need to expand our pool of educators in CTE subjects – bringing in career professionals. We need to build closer working alliances with NH businesses so that students have more opportunities to job shadow, apprentice and intern – building real world experience into their CTE studies. CTEs have a critical role to play to close the gender gap in computer science, math, engineering and general sciences. Need a focus on introducing STE/STEM topics in early grades (elementary and middle school).
- STARTING EARLY: Students should be introduced to STEM topics early and provided real-world exposure including internships, guest speakers and interaction with businesses/employers by bringing students out into businesses and learning labs.

EMPOWERING TEACHERS

- THINKING ABOUT STEM ACROSS THE CURRICULUM: Currently we tend to treat STEM subjects as an activity – usually at best – once a week. We need to think about creative ways to integrate into already busy class schedules.
- TEACHING STEM SUBJECTS: We have fine teachers in NH but not all of them have been sufficiently trained to understand and teach STEM subjects. The Task Force aims to assist the Department of Education in new approaches to STEM professional development and credentialing. This is especially important to bringing in professional women who have successful careers in STEM – teaching, business and research.

V. Task Force organizational issues discussed.

Chairman Gittell suggested that a meeting schedule for 2015-2016 be deferred until working groups had developed their strategic plans. In order to provide context for working groups, Chairman Gittell

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will develop in cooperation with Governor's office, a suggested framework for Task Force deadlines and milestones for 2015-2016.

V. Working groups discussions

The Task Force divided into four working groups for preliminary discussions of priorities and strategic planning next steps including short and long term goals, meeting, deliverables for 2015-2016, metrics (measuring success of those deliverables), timetable (milestones for implementation) and other items including meeting schedule. Meeting schedules will be posted as soon as available

VI. **Public input.**

Special guests: NH High Tech Council Tech Women Ambassador's week for Girls in STEM, Nov. 16. Carol Miller (Director of Broadband Technology, NH Department of Resources and Economic Development) and Catherine Blake, CEO, Sales Protocol, board member of the New Hampshire High Tech Council and chair of Tech Women/Tech Girls (the new initiative of the NH High Tech Council) reviewed plans for a statewide Ambassador's week. Ambassador's week will bring together women in STEM-careers who will visit area high schools to talk with 9th and 10th grade girls about STEM career opportunities. For more information contact: Carol Miller at carol.miller@dred.nh.gov

Bill Hinton (Hinton Technical Services). Offered his services to help Task Force, particularly in the area of Engineering Metrology educational support.

VII. Next meeting date: TBD

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Addendum A:

NH TASK FORCE ON STEM K-12 EDUCATION WORKING GROUPS

STRENGTHENING STEM FOUNDATIONS
REC #1 –Math pathways and coding
REC #2 – NGSS
INSPIRING STUDENTS
REC #3 – Challenges, Competitions, Capstones
REC #4 – Early College Academies
A. NH Math and Science Academy
B. CTEs
REC #5 - Personal Learning Plans
REC #6 – Girls in STEM
EMPOWERING TEACHERS
REC #7 – STEM Every Day in Different Ways
REC #8 – Teacher Professional Development
Communications and Engagement
STEM Collaboration hubs
Communications (<i>includes outreach to different audiences, A Year of STEM special events, STEM ambassadors, website development, messaging</i>)
Higher Education and STEM (<i>outreach, pathways and NH employment</i>)