

First Meeting Held to Explore Integration of Engineering in Mathematics and Science Courses

Moorestown, N.J., Oct. 31, 2013 – The Knowles Science Teaching Foundation (KSTF) today announced the formation of an engineering task force. The newly formed KSTF Engineering Task Force, made up of 19 KSTF Senior Fellows, met in person in late July to begin discussions about how to integrate engineering into all mathematics and science courses, as spelled out by the new requirements found in the [Next Generation Science Standards](#) (NGSS).

Seeing a need for engineering resources generated by teachers who are still in the classroom, the task force was initiated under the purview of Dr. Dina Portnoy, Director of KSTF's Senior Fellows Program. As part of the leadership team, Senior Fellows [Casey O'Hara](#), a mechanical engineer turned physics teacher, and [Anne Watson](#), a physics teacher at Montpelier High School (Montpelier, Vt.), have worked closely with Dr. Portnoy to establish the mission of the task force.

Watson stated, "Through the design of solutions for real-world problems, engineering allows students to impact their communities in a positive way. I am personally excited about the inclusion of this discipline in secondary science classes across the nation."

With an emphasis on the inclusion of engineering in mathematics and all branches of secondary science, the KSTF Engineering Task Force seeks to accomplish the following tasks:

- To identify and evaluate engineering resources, and to make the case for the kinds of experiences teachers need to build their capacity to implement engineering design practices in their curricula;
- To provide resources, dialogue, and support for teachers to increase their capacity for incorporating engineering practices;
- And to facilitate and better understand improved student learning outcomes and knowledge of engineering through the transformation of classroom practices.

During the first meeting of the task force, participants defined a model of the engineering design process that will be used to guide the development of resources and curricular materials. The group identified many of the critical themes and challenges related to the use of engineering design, created a matrix of desired outcomes and developed a diagram for high school students that explains the engineering design process. Prior to the close of the meeting, they received valuable feedback from engineering experts [Dr. Cary Sneider](#), NGSS Writing Team Leader, and Simon Hauger, former engineer and co-founder of [The Workshop School](#).

Dr. Sneider said, “I was very impressed with the knowledge, creativity and commitment of the KSTF Senior Fellows that I met. If we are going to meet the goal of the new standards—to engage students in applying science to solving problems and meeting people’s needs through engineering—these teachers will figure out how to do it.”

The participants formed sub-groups organized around three areas of focus for the 2013-2014 school year: developing a usable model of engineering design based upon NGSS; creating a library of tools, resources and projects aligned with said model; and designing professional development materials that will enable secondary math and science teachers to use these resources to create and implement engineering units and projects. Under the leadership of Senior Fellows Liz Ratliff, [Patricia Schaefer](#) and [Jordan Pasqualin](#), respectively, the sub-groups will use electronic forums to discuss progress. Additionally, the full task force will meet in person periodically, including again this fall, to ensure the development of a coherent suite of materials across all disciplines.

“Many secondary math and science teachers may find the task of incorporating design-based problem solving to be a challenging one,” commented Dr. Portnoy. “Well versed in STEM content, supported by KSTF resources and experienced in using collaborative and inquiry processes to build knowledge and expertise, our Senior Fellows are uniquely positioned to address this challenge.”

“It is my hope that the resources and knowledge generated by the KSTF Engineering Task Force will help to increase the presence of underrepresented minorities in the field of engineering, as we work to provide high school students with an innovative and engaging introduction to the subject,” stated O’Hara.