

## STEM Resources provided by Robert Farley

### Worcester Polytechnical Institute

The STEM Education Center develops and conducts in-school PDs for PK-12 educators. All programs offered by the Center are aligned with the Next Generation Science Standards and model key elements of the Massachusetts Teacher Evaluation Rubric. The programs are designed as hands-on experiences and model cooperative learning pedagogy. The proposal is focused on introduction and exploration of integrated STEM projects.

PD goals at the end of instruction, participating educators will: 1. Increase their awareness, confidence in, and knowledge of the components of quality STEM education; 2. Make connections between the NGSS practices and integrated STEM projects; 3. Experience first-hand integrated STEM activities; and 4. Develop/adapt at least one STEM project.

The tentative agenda, for a two-day training session, includes multiple aspects of STEM curriculum integration, which are listed below.

#### STEM Education and the Engineering Design Process

-Introductory design challenge -Defining STEM education -Key components of quality STEM education - The engineering design process: creating posters and classroom visuals -STEM resources (Option 1: separate grade level STEM projects/design challenge applications & Option 2: the entire group is engaged with one project about heat transfer and insulation) -Grade level work: grade level teams adapt the day's activities to be used in their classroom

#### The NGSS and STEM Education

-Developing and using models -Why do scientists, engineers, and mathematicians use models? -The Mystery Tube activity -The role of modeling in supporting science & engineering learning -Multiple representations and the different types of models: physical models, illustrations, computer simulation, mathematical models, conceptual models, etc. -Developing models: modeling the solar system (to scale) AND/OR modeling the concept of half-life -Resources for models of scientific & mathematical phenomena -In small groups, participants review resources and develop/adapt a modeling activity to a unit they are about to teach.

Furthermore, these education design principles may be mixed and matched to fit a one-day training period if you choose to do so.

### IQWST

I recently returned from touring the Dayton Regional STEM School in Ohio. During my excursion throughout the school, I was given the opportunity to speak with numerous students and teachers; while the faces of these conversations changed, one major topic item did not. The educational resource I am referring to is IQWST (Investigating & Questioning our World Through Science & Technology) which was funded by the National Science Foundation and created by the some of the same developers that designed the Next Generation Science Standards. Because of this, the instruction is dedicated to interactive, hands-on learning assignments with real-world applications embedded into each assignment/lesson for language arts and science. Since West Virginia is not exactly STEM-oriented, when

considering the public schools system, IQWST does not caravan to this state; however, I spoke with the Director of Sales for the company and she would be willing to present and go through the benefits and outcomes for implementing this program into your school.

I should also mention that this is generally for middle schools. But at the DRSS, they adjusted and instructed some of these lesson plans into their high school curriculum. The costs associated with these kits are relatively low (less than \$1000), so if anyone feels like this might be something that will benefit their school, then please let me know so that I can coordinate with them to visit your school. After hearing nothing but positive feedback about this opportunity, I knew that it was too good to keep all to myself. :)

For more information visit [www.activatelearning.com/iqwst](http://www.activatelearning.com/iqwst)

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