



Smithsonian
Science Education Center

Course Overview

This online workshop: **Fired Up About Energy** is based on ideas presented in *Good Thinking!*, an original animated series developed by the Smithsonian Science Education Center (SSEC) and FableVision Studios as a professional development resource for K-12 science educators.

Energy is a very important concept in science. The NGSS K-12 Science Framework identifies Energy as one of major disciplinary core ideas (DCIs) in physical sciences and it is also identified as one of the crosscutting concepts (CCCs) that can be used to connect all science content areas together. Because energy is such a common idea in many parts of our lives, the term energy is often used in many ways, which creates confusions and misconceptions about energy.

This workshop looks at the scientific concept of energy and at some of the challenges of helping students build a more complete understanding of energy as a property of a system.

The format and organization of the workshop are designed to allow individuals to successfully complete the online learning activities independently as a self-paced class, without the need for outside input or feedback. At the same time, this format was designed to flexibly fit into PLC meetings, PD workshops, or any time that you and your colleagues can meet to absorb some new ideas and discuss your experiences as educators. While the content of the series is relevant to all levels of instruction, teachers working at the oldest and youngest ends of the K-12 range may need to include additional discussion during the post-viewing conversation that addresses the implications of the videos for their specific grade level.

Session 1 – Introduction to Course

This session serves as an introduction to the course. The objectives for this course are:

- Increase understanding of teaching about energy.
- Use pre-existing student pre-conceptions/misconceptions and mental models as starting points to teach new ideas.
- Increase understanding of instructional strategies presented in the video.
- Apply the strategies to planning new instruction.

Session 2 – Understanding Energy

In this session, participants are introduced to the concept of energy in a physical science lab demonstration. The goal is to develop a mental model of energy as a property of a system that can be used as one of the characteristics that describes or defines the system.

Session 3 – Classroom Application

In this session participants will apply the ideas and lessons from the video to develop or adapt a lesson plan. The first part of the session will have teachers use a lesson plan template based on the ideas in the video, and look for additional tools and strategies that could be used. The second part of the session will have teachers develop a new lesson plan, based on a topic from their own curriculum.

Session 4 – Wrap Up

This session is a conclusion to the course. The final assessment will be the creation of a lesson plan for your own classroom to produce opportunities for students to understand and apply the five Big Ideas of energy to the systems they want to study.

There will be the option of earning a Science of Teaching Science 1 certificate upon completion of four Smithsonian Science Education Center Pepper Online Workshops.