

## **High School Planning Video Standards Addressed**

*Massachusetts Science and Technology/Engineering Curriculum Framework, October 2006*

### Introductory Physics, High School

- 5.1 Recognize that an electric charge tends to be static on insulators and can move on and in conductors. Explain that energy can produce a separation of charges.
- 5.2 Develop qualitative and quantitative understandings of current, voltage, resistance, and the connections among them (Ohm's law).
- 5.3 Analyze simple arrangements of electrical components in both series and parallel circuits. Recognize symbols and understand the functions of common circuit elements (battery, connecting wire, switch, fuse, resistance) in a schematic diagram.
- 5.5 Explain how electric current is a flow of charge caused by a potential difference (voltage), and how power is equal to current multiplied by voltage.

### Technology/Engineering, High School

- 1.1 Identify and explain the steps of the engineering design process: identify the problem, research the problem, develop possible solutions, select the best possible solution(s), construct prototypes and/or models, test and evaluate, communicate the solutions, and redesign.
- 1.2 Understand that the engineering design process is used in the solution of problems and the advancement of society. Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified.
- 1.3 Produce and analyze multi-view drawings (orthographic projections) and pictorial drawings (isometric, oblique, perspective), using various techniques.
- 1.5 Interpret plans, diagrams, and working drawings in the construction of prototypes or models.
- 5.1 Explain how to measure and calculate voltage, current, resistance, and power consumption in a series circuit and in a parallel circuit. Identify the instruments used to measure voltage, current, power consumption, and resistance.
- 5.2 Identify and explain the components of a circuit, including sources, conductors, circuit breakers, fuses, controllers, and loads. Examples of some controllers are switches, relays, diodes, and variable resistors.
- 5.3 Explain the relationships among voltage, current, and resistance in a simple circuit, using Ohm's law.

## **High School Evaluation Discussion Video Standards Addressed**

**Standard I: Curriculum, Planning, and Assessment.** The teacher promotes the learning and growth of all students by providing high-quality and coherent instruction, designing and administering authentic and meaningful student assessments, analyzing student performance and growth data, using this data to improve instruction, providing students with constructive feedback on an ongoing basis, and continuously refining learning objectives.

Indicator I-A. Curriculum and Planning: **Knows the subject matter well, has a good grasp of child development and how students learn, and designs effective and rigorous standards-based units of instruction consisting of well-structured lessons with measurable outcomes.**

**Standard II: Teaching All Students.** The teacher promotes the learning and growth of all students through instructional practices that establish high expectations, create a safe and effective classroom environment, and demonstrate cultural proficiency.

Indicator II-A. Instruction: **Uses instructional practices that reflect high expectations regarding content and quality of effort and work; engage all students; and are personalized to accommodate diverse learning styles, needs, interests, and levels of readiness.**

Indicator II-B. Learning Environment: **Creates and maintains a safe and collaborative learning environment that motivates students to take academic risks, challenge themselves, and claim ownership of their learning.**

**Standard IV: Professional Culture.** The teacher promotes the learning and growth of all students through ethical, culturally proficient, skilled, and collaborative practice.

Indicator IV-C. Collaboration: **Collaborates effectively with colleagues on a wide range of tasks.**