

# Science and Mathematics Education Standards for the THEMIS workshop activities

## California Science Education Standards

### **Grade 8**

Motion - students know that average speed is the total distance traveled divided by the total time elapsed and that the speed of an object along the path traveled can vary. Students know how to solve problems involving distance, time, and average speed.

Forces – students know a force has both direction and magnitude.

Investigation and Experimentation – Students will apply simple mathematic relationships to determine a missing quantity in a mathematic expression, given the two remaining terms.

### **Grades 9-12**

Electric and Magnetic Phenomena – Students know magnetic materials and electric currents (moving electric charges) are sources of magnetic fields and are subject to forces arising from the magnetic fields of other sources. Students know how to determine the direction of a magnetic field produced by a current flowing in a straight wire or in a coil. Students know plasma, the fourth state of matter, contains ions or free electrons or both and conducts electricity. Students know ... magnetic fields ... act as vector force fields.

Investigation and Experimentation – Students will read and interpret topographic and geologic maps, analyze the locations, sequences, or time intervals that are characteristic of natural phenomena, recognize the cumulative nature of scientific evidence.

## California Mathematics Education Standards

### **Grades 8-12**

Algebra

Probability and Statistics

## National Science Education Standards

Science as inquiry; USE TECHNOLOGY AND MATHEMATICS TO IMPROVE INVESTIGATIONS AND COMMUNICATIONS (**Grades 5-12**)

Physical Science; MOTIONS AND FORCES: (**grades 5-8**) The motion of an object can be described by its position, direction of motion, and speed. (**grades 9-12**) Electricity and magnetism are two aspects of a single electromagnetic force. Moving electric charges produce magnetic forces, and moving magnets produce electric forces. These effects help students to understand electric motors and generators.

Earth and Space Science; STRUCTURE OF THE EARTH SYSTEM: (**grades 5-8**) The solid Earth is layered with a lithosphere; hot, convecting mantle; and dense, metallic core.

History and Nature of Science; SCIENCE AS A HUMAN ENDEAVOR and HISTORICAL PERSPECTIVES (**Grades 5-12**)

## National Mathematics Education Standards

Number Sense, Concepts, and Operations; the student adds, subtracts, multiplies, and divides real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

Measurement; the student selects and uses direct (measured) or indirect (not measured) methods of measurement as appropriate. The student solves real-world problems involving rated measures. The student solves real-world and mathematical problems involving estimates of measurements.