



*From the:*  
**Science Content Standards for California Public Schools.**

**Grade Four**

**Physical Sciences & Investigation and Experimentation**

The following is a list of the Science Content Standards for California Public Schools -- Grade Four, and the chapters in Exploration Education's Intermediate Physical Science curriculum – STANDARD version that support these standards.



*Covered in Exploration Education's*  
**STANDARD Physical Science Curriculum**

<b>Physical Sciences</b>		
<b>1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:</b>		<i>Covered in EE's Curriculum</i>
a. Students know how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs		10.2, 12.1, 12.2
b. Students know how to build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.		16.1
c. Students know electric currents produce magnetic fields and know how to build a simple electromagnet.		16.3
d. Students know the role of electromagnets in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones.		17.1, 17.2, 17.3, 18.1, 18.2
e. Students know electrically charged objects attract or repel each other.		11.1, 11.2
f. Students know that magnets have two poles (north and south) and that like poles repel each other while unlike poles attract each other.		15.1, 15.2, 15.3
g. Students know electrical energy can be converted to heat, light, and motion.		10.3, 14.1, 17.1

<b>Investigation and Experimentation</b>		
<b>6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:</b>		<i>Covered in EE's Curriculum</i>
a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.		1.1
b. Measure and estimate the weight, length, or volume of objects.		5.1, 5.2 6.1, 20.1
c. Formulate and justify predictions based on cause-and-effect relationships.		1.1 All Experiments
d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.		Experiments
e. Construct and interpret graphs from measurements.		16.2
f. Follow a set of written instructions for a scientific investigation.		All Experiments



Grade

5



From the:

## Science Content Standards for California Public Schools.

### Grade Five

#### Physical Sciences & Investigation and Experimentation

The following is a list of the Science Content Standards for California Public Schools -- Grade Five, and the chapters in Exploration Education's Intermediate Physical Science curriculum – STANDARD version (7.1.3) that support these standards.



Covered in Exploration Education's **STANDARD Physical Science Curriculum**

### Physical Sciences

2. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:

- a. Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.
- b. Students know all matter is made of atoms, which may combine to form molecules.
- c. Students know metals have properties in common, such as high electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni), copper (Cu), silver (Ag), and gold (Au), are pure elements; others, such as steel and brass, are composed of a combination of elemental metals.
- d. Students know that each element is made of one kind of atom and that the elements are organized in the periodic table by their chemical properties.
- e. Students know scientists have developed instruments that can create discrete images of atoms and molecules that show that the atoms and molecules often occur in well-ordered arrays.
- f. Students know differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.
- g. Students know properties of solid, liquid, and gaseous substances, such as sugar (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>), water (H<sub>2</sub>O), helium (He), oxygen (O<sub>2</sub>), nitrogen (N<sub>2</sub>), and carbon dioxide (CO<sub>2</sub>).
- h. Students know living organisms and most materials are composed of just a few elements.
- i. Students know the common properties of salts, such as sodium chloride (NaCl).

Covered in EE's Curriculum
27.1, 27.2
10.1, 20.3, 24.1
22.2
20.2, 20.3
23.3
22.1, 23.1, 23.2, 24.1
19.2, 25.1, 25.2, 25.3
20.2, 20.3
24.3

### Investigation and Experimentation

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

- g. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.
- h. Develop a testable question.
- i. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
- j. Identify the dependent and controlled variables in an investigation.
- k. Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.
- l. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
- m. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
- n. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.
- o. Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions.

Covered in EE's Curriculum
19.2
1.1 All Experiments
5.2, 27.2
5.2, 27.2
5.2, 27.2
5.2, 27.2 ALL exp
16.2
5.2, 27.2 All Experiments
All Experiments