

# Kindergarten

## MSI Program

## California Science Standard

### Physical Sciences

**1. Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:**

Shoreside, Inland Voyage

a. *Students know* objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

### Life Sciences

**2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:**

Shoreside, Inland Voyage

a. *Students know* how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).

Shoreside, Inland Voyage

c. *Students know* how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

### Earth Science

**3. Earth is composed of land, air, and water. As a basis for understanding this concept:**

Shoreside, Inland Voyage

b. *Students know* changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.

### Investigation and Experimentation

**4. 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:**

Shoreside, Inland Voyage

a. Observe common objects by using the five senses.

Shoreside, Inland Voyage

b. Describe the properties of common objects.

Shoreside, Inland Voyage

c. Describe the relative position of objects by using one reference (e.g., above or below).

Shoreside, Inland Voyage

d. Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).

Shoreside, Inland Voyage

e. Communicate observations orally and through drawings.

# Grade One

## MSI Program

## California Science Standard

### Life Sciences

#### **2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:**

- Shoreside, Inland Voyage a. *Students know* different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.
- Shoreside, Inland Voyage b. *Students know* both plants and animals need water, animals need food, and plants need light.
- Shoreside, Inland Voyage c. *Students know* animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.
- Shoreside, Inland Voyage d. *Students know* how to infer what animals eat from the shapes of their teeth (e.g., sharp teeth: eats meat; flat teeth: eats plants).
- Shoreside e. *Students know* roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

### Earth Sciences

#### **3. Weather can be observed, measured, and described. As a basis for understanding this concept:**

- Shoreside b. *Students know* that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

### Investigation and Experimentation

#### **4. 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:**

- Shoreside, Inland Voyage d. Describe the relative position of objects by using two references (e. g., above and next to, below and left of).
- Shoreside, Inland Voyage e. Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.

# Grade Two

## MSI Program

## California Science Standard

### Life Sciences

#### **2. Plants and animals have predictable life cycles. As a basis for understanding this concept:**

Shoreside, Inland Voyage

Shoreside

Shoreside, Inland Voyage

Shoreside, Inland Voyage

Shoreside

a. *Students know* that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another.

b. *Students know* the sequential stages of life cycles are different for different animals, such as butterflies, frogs, and mice.

c. *Students know* many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment.

d. *Students know* there is variation among individuals of one kind within a population.

e. *Students know* light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.

### Investigation and Experimentation

#### **4. 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:**

Shoreside, Inland Voyage

Shoreside, Inland Voyage

Shoreside

a. Make predictions based on observed patterns and not random guessing.

c. Compare and sort common objects according to two or more physical attributes (e. g., color, shape, texture, size, weight).

f. Use magnifiers or microscopes to observe and draw descriptions of small objects or small features of objects.

# Grade Three

## MSI Program

## California Science Standard

### Life Sciences

**3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:**

Shoreside, Inland Voyage

a. *Students know* plants and animals have structures that serve different functions in growth, survival, and reproduction.

Shoreside, Inland Voyage

b. *Students know* examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Shoreside, Inland Voyage

c. *Students know* living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

Shoreside, Inland Voyage

d. *Students know* when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.

Shoreside, Inland Voyage

e. *Students know* that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

### Investigation and Experimentation

**5. 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:**

Shoreside

b. Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.

Shoreside

c. Use numerical data in describing and comparing objects, events, and measurements.

Shoreside

d. Predict the outcome of a simple investigation and compare the result with the prediction.

Shoreside

e. Collect data in an investigation and analyze those data to develop a logical conclusion.

# Grade Four

## MSI Program

## California Science Standard

### Life Science

#### 2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:

Discovery Voyage, Shoreside  
Discovery Voyage, Shoreside,  
Tidepool, Inland Voyage, Ocean  
Lab  
Discovery Voyage, Shoreside

- a. *Students know* plants are the primary source of matter and energy entering most food chains.
- b. *Students know* producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
- c. *Students know* decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.

#### 3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab  
Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab  
Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab  
Discovery Voyage, Shoreside

- a. *Students know* ecosystems can be characterized by their living and nonliving components.
- b. *Students know* that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- c. *Students know* many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
- d. *Students know* that most microorganisms do not cause disease and that many are beneficial.

### Earth Sciences

#### 5. Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:

Discovery Voyage  
  
Discovery Voyage

- a. *Students know* some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.
- c. *Students know* moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

### Investigation and Experimentation

#### 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:

Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab  
Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab  
Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab

- a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
- c. Formulate and justify predictions based on cause-and-effect relationships.
- d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.

# Grade Five

## MSI Program

## California Science Standard

### Life Sciences

**2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:**

Discovery Voyage, Shoreside

f. *Students know* plants use carbon dioxide (CO<sub>2</sub>) and energy from sunlight to build molecules of sugar and release oxygen.

### Earth Sciences

**3. Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept:**

Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab, Inland  
Voyage

a. *Students know* most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.

Discovery Voyage, Shoreside,  
Inland Voyage

d. *Students know* that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.

Discovery Voyage, Shoreside,  
Inland Voyage

e. *Students know* the origin of the water used by their local communities.

**4. Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns. As a basis for understanding this concept:**

Discovery Voyage

b. *Students know* the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.

### Investigation and Experimentation

**6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept**

Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab, Inland  
Voyage

a. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.

Discovery Voyage, Shoreside

b. Develop a testable question.

Discovery Voyage, Shoreside

f. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.

Discovery Voyage, Shoreside

h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

# Grade Six

## MSI Program

## California Science Standard

### Shaping Earth's Surface

**2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:**

- Discovery Voyage, Shoreside b. *Students know* rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.
- Ocean Lab, Tidepool, Inland Voyage c. *Students know* beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.

### Energy in the Earth System

**4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:**

- Discovery Voyage, Shoreside a. *Students know* the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

### Ecology (Life Science)

**5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:**

- Discovery Voyage, Shoreside, Tidepool, Ocean Lab, Inland Voyage a. *Students know* energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.
- Discovery Voyage, Shoreside, Tidepool, Ocean Lab, Inland Voyage b. *Students know* matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
- Discovery Voyage, Shoreside, Tidepool, Ocean Lab, Inland Voyage c. *Students know* populations of organisms can be categorized by the functions they serve in an ecosystem.
- Discovery Voyage, Shoreside, Tidepool, Ocean Lab, Inland Voyage d. *Students know* different kinds of organisms may play similar ecological roles in similar biomes.
- Discovery Voyage, Shoreside, Tidepool, Ocean Lab, Inland Voyage e. *Students know* the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

### 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:**

- Discovery Voyage, Shoreside, Ocean Lab a. Develop a hypothesis.
- Discovery Voyage, Shoreside b. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
- Discovery Voyage, Shoreside d. Communicate the steps and results from an investigation in written reports and
- Discovery Voyage, Shoreside e. Recognize whether evidence is consistent with a proposed explanation.

## MSI Program

# Grade Seven

## California Science Standard

### Cell Biology

**1. All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:**

Discovery Voyage, Shoreside

a. *Students know* cells function similarly in all living organisms.

Discovery Voyage, Shoreside

b. Students know the characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls.

### Genetics

**2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:**

Discovery Voyage, Shoreside,  
Ocean Lab

a. *Students know* the differences between the life cycles and reproduction methods of sexual and asexual organisms.

### Evolution

**3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:**

Discovery Voyage, Shoreside,  
Tidepool, Ocean Lab, Inland  
Voyage

a. *Students know* both genetic variation and environmental factors are causes of evolution and diversity of organisms.

Discovery Voyage, Shoreside

e. *Students know* that extinction of a species occurs when the environment changes and that the adaptive characteristics of a species are insufficient for its survival.

### Structure and Function in Living Systems

**5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:**

Discovery Voyage, Shoreside,  
Ocean Lab

a. *Students know* plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.

### 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:**

Discovery Voyage, Shoreside

a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.

Discovery Voyage, Shoreside

c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.

Discovery Voyage, Shoreside

e. Communicate the steps and results from an investigation in written reports and oral presentations.

# Grade Eight

## MSI Program

## California Science Standard

### Density and Buoyancy

**8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:**

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| Discovery Voyage, Shoreside | a. <i>Students know</i> density is mass per unit volume.  |
| Discovery Voyage, Shoreside | b. <i>Students know</i> how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume. |
| Discovery Voyage, Shoreside | c. <i>Students know</i> the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced.     |
| Discovery Voyage, Shoreside | d. <i>Students know</i> how to predict whether an object will float or sink.  |

### Investigation and Experimentation

**9. 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:**

- |                             |  |
|-----------------------------|--|
| Discovery Voyage, Shoreside | a. Plan and conduct a scientific investigation to test a hypothesis. |
| Discovery Voyage, Shoreside | b. Evaluate the accuracy and reproducibility of data.                |