



## **Salmon & Trout Education Program**

### ***California State Science Content Standards Fulfilled by Field Trips***

#### **Small Fry (Kindergarten)**

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

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).

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

a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.

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

c. Students know how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

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:

a. Observe common objects by using the five senses.

b. Describe the properties of common objects.

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

e. Communicate observations orally and through drawings.

*Pre-visit Activity: Baby Bug Bingo*



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

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

### **Mighty Minnows (1<sup>st</sup> Grade)**

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

- 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.
- b. Students know both plants and animals need water, animals need food, and plants need light.
- c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

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

- a. Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.
- 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.

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:

- a. Draw pictures that portray some features of the thing being described.



- b. Record observations and data with pictures, numbers, or written statements

*Pre-visit Activity: Baby Bug Bingo*

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

- 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.

*Post-visit Activity: The Last Salmon*

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**Bedrock n' Roll (2<sup>nd</sup> Grade)**

1. The motion of objects can be observed and measured. As a basis for understanding this concept:

- a. Students know the position of an object can be described by locating it in relation to another object or to the background.

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

- 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.

3. Earth is made of materials that have distinct properties and provide resources for human activities. As a basis for understanding this concept:

- a. Students know how to compare the physical properties of different kinds of rocks and know that rock is composed of different combinations of minerals.
- b. Students know smaller rocks come from the breakage and weathering of larger rocks.
- c. Students know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants.

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:

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

*Pre-visit Activity: Baby Bug Bingo*

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### **River Keepers (3<sup>rd</sup> Grade)**

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

- a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
- b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
- 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.
- d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.

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.

- c. Use numerical data in describing and comparing objects, events, and measurements.
- d. Predict the outcome of a simple investigation and compare the result with the prediction.
- e. Collect data in an investigation and analyze those data to develop a logical conclusion.



*Pre-visit Activity: Baby Bug Bingo*

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

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

*Post-visit Activity: The Last Salmon*

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

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

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

**Against the Stream (4<sup>th</sup> Grade)**

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

a. Students know ecosystems can be characterized by their living and nonliving components.

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

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.

b. Students know natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.



- 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).
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:
- a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
  - b. Measure and estimate the weight, length, or volume of objects.
  - c. Formulate and justify predictions based on cause-and-effect relationships.

*Pre-visit Activity: Salmon Survival*

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:
- a. Students know ecosystems can be characterized by their living and nonliving components.

*Post-visit Activity: Habitat Battleship*

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

### **Hooked on Chinooks (5<sup>th</sup> Grade)**

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

- c. Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.

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:

- a. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria
- c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
- d. Identify the dependent and controlled variables in an investigation.
- g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
- h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

#### *Pre-visit Activity: The Great Salinity Search*

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

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

#### *Post-visit Activity: Who's Who?:*



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:

- g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.

### **Riparian Rangers (6<sup>th</sup> Grade)**

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:

- a. Students know water running downhill is the dominant process in shaping the landscape, including California's landscape.

- b. Students know rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.

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

- c. Students know populations of organisms can be categorized by the functions they serve in an ecosystem.

- d. Students know different kinds of organisms may play similar ecological roles in similar biomes.

- 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.

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:

- a. Develop a hypothesis.



- 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.

*Pre-visit Activity: The Great Salinity Search*

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:

- 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.

*Post-visit Activity: Habitat Battleship*

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

- 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.
- b. Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
- c. Students know populations of organisms can be categorized by the functions they serve in an ecosystem.
- d. Students know different kinds of organisms may play similar ecological roles in similar biomes.
- 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.

**Steelhead Stewards (7<sup>th</sup> Grade)**

6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:



b. Students know that for an object to be seen, light emitted by or scattered from it must be detected by the eye.

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:

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.

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

*Pre-visit Activity: Getting it Together!*

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

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

*Post-visit Activity: The Last Salmon*

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:

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

b. Students know sexual reproduction produces offspring that inherit half their genes from each parent.

## **Current Events (8<sup>th</sup> Grade)**

1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:

a. Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.



- b. 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.
  - c. Students know how to solve problems involving distance, time, and average speed.
  - d. Students know the velocity of an object must be described by specifying both the direction and the speed of the object.
  - e. Students know changes in velocity may be due to changes in speed, direction, or both.
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:
- a. Plan and conduct a scientific investigation to test a hypothesis.
  - b. Evaluate the accuracy and reproducibility of data.
  - c. Distinguish between variable and controlled parameters in a test.

*Pre-Visit Activity: The Great Salinity Search*

8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:
- a. Students know density is mass per unit volume.
  - b. Students know how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.

**The First S.T.E.P. (9<sup>th</sup>-12<sup>th</sup> Grade)**

1. 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 four strands, students should develop their own questions and perform investigations. Students will:



- a. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.
  - b. Identify and communicate sources of unavoidable experimental error.
  - c. Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.
  - d. Formulate explanations by using logic and evidence.
6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:
- a. Students know bio diversity is the sum total of different kinds of organisms and is affected by alterations of habitats.
  - b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.
  - e. Students know a vital part of an ecosystem is the stability of its producers and decomposers.

*Pre-visit Activity: Salmon Survival*

6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:
- b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.