

A SCHMAHL SCIENCE WORKSHOP

GRADE



3

HOUGHTON MIFFLIN

Reading

★ California ★

Grade 3 - Horizons



STAR CST

Blueprint For
Grade 5 Science Test

A SCHMAHL SCIENCE WORKSHOP

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Houghton-Mifflin

GR-3

Theme 4:
Animal Habitats

A SCHMAHL SCIENCE WORKSHOP

**AGILENT:
OWL PELLETS**

SSW: Workshop 156, 194 BIO

California
STAR CST
Blueprint
Life Sciences
30%

Night of the Pufflings, by Bruce McMillan (HM-TM 10K-43N)

Vocabulary, Transparency 4-1 (HM-TM 17A)

Comprehension Skill, Fact and Opinion (HM-TM 17C)

HM Objectives:

- R 2.2 Connect with prior knowledge (HM-TM 18-25)
- R 2.4 Make and modify predictions (HM-TM 18-25)
- R 2.5 Distinguish main ideas from details (HM-TM 18-25)
- R 2.6 Extract significant information (HM-TM 18-25)
- W 2.3 Write descriptions (HM-TM 34, R-23-R-25)
- W 2.3 Understand reference materials (HM-TM 39C)
- LS 1.11 Distinguish opinions and facts (HM-TM 14A-39A, R8)
- S 3.a Plant and Animal Structures (HM-TM R9, R23-R25)
- S 3.b Diverse life forms/environments (HM-TM 35)



Theme Paperbacks

Grow! A Book About Bears, by Melvin Berger (Easy)
Rain Forests Babies, by Kathy Darling (On Level)
In Good Hands, by Stephen R. Swinburne (Challenge)
HM-TM 43M

Science Standards – California

Life Sciences

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.

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:
 - a. Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.
 - 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.
 - 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.

Language Arts Standards - California

Reading: Vocabulary

- R 1.4 Find meaning from context (HM-TM 18-25)

Reading: Comprehension and Analysis of Grade-Level-Appropriate Text:

- R 2.2 Connect with prior knowledge (HM-TM 18-25)
- R 2.4 Make and modify predictions (HM-TM 18-25)
- R 2.5 Distinguish main ideas from details (HM-TM 18-25)
- R 2.6 Extract significant information (HM-TM 18-25)

Writing

- W 2.3 Write descriptions (HM-TM 34, R-23-R-25)
- W 2.3 Understand reference materials (HM-TM 39C)

Listening and Speaking:

- LS 1.11 Distinguish opinions and facts (HM-TM 14A-39A, R8)

Science

- S 3.a Plant and Animal Structures (HM-TM R9, R23-R25)
- S 3.b Diverse life forms/environments (HM-TM 35)

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Theme 4:
Animal Habitats

A SCHMAHL SCIENCE WORKSHOP

**BIRD BEAK
ADAPTATIONS**
SSW: Workshop 189 BIO

California
STAR CST
Blueprint
Life Sciences
30%

Night of the Pufflings, by Bruce McMillan (HM-TM 10K-43N)

Vocabulary, Transparency 4-1 (HM-TM 17A)

Comprehension Skill, Fact and Opinion (HM-TM 17C)

HM Objectives:

- R 2.2 Connect with prior knowledge (HM-TM 18-25)
- R 2.4 Make and modify predictions (HM-TM 18-25)
- R 2.5 Distinguish main ideas from details (HM-TM 18-25)
- R 2.6 Extract significant information (HM-TM 18-25)
- W 2.3 Write descriptions (HM-TM 34, R-23-R-25)
- W 2.3 Understand reference materials (HM-TM 39C)
- LS 1.11 Distinguish opinions and facts (HM-TM 14A-39A, R8)
- S 3.a Plant and Animal Structures (HM-TM R9, R23-R25)
- S 3.b Diverse life forms/environments (HM-TM 35)

Theme Paperbacks

Grow! A Book About Bears, by Melvin Berger (Easy)
Rain Forests Babies, by Kathy Darling (On Level)
In Good Hands, by Stephen R. Swinburne (Challenge)

Science Standards – California

Life Sciences

4. **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.

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:
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 - 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.
 - 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.

Language Arts Standards - California

Reading: Vocabulary

- R 1.4 Find meaning from context (HM-TM 18-25)

Reading: Comprehension and Analysis of Grade-Level-Appropriate Text:

- R 2.2 Connect with prior knowledge (HM-TM 18-25)
- R 2.4 Make and modify predictions (HM-TM 18-25)
- R 2.5 Distinguish main ideas from details (HM-TM 18-25)
- R 2.6 Extract significant information (HM-TM 18-25)

Writing

- W 2.3 Write descriptions (HM-TM 34, R-23-R-25)
- W 2.3 Understand reference materials (HM-TM 39C)

Listening and Speaking:

- LS 1.11 Distinguish opinions and facts (HM-TM 14A-39A, R8)

Science

- S 3.a Plant and Animal Structures (HM-TM R9, R23-R25)
- S 3.b Diverse life forms/environments (HM-TM 35)

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Theme 4:
Animal Habitats

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WHALES

SSW: Workshop #38 BIO

California
STAR CST
Blueprint
Life Sciences
30%

Surfer Seal, by Michael Foreman (HM-TM 43-69)

Vocabulary, Transparency 4-9 (HM-TM 44A)

Comprehension Skill, Compare and Contrast (HM-TM 45C)

HM Objectives:

- R 2.2 Connect with prior knowledge (HM-TM 47-55)
- R 2.3 Identify answers in text (HM-TM 47-55)
- R 2.4 Make and modify predictions (HM-TM 47)
- R 2.6 Extract significant information (HM-TM 47-55)
- W 2.2 Write descriptions (HM-TM 69M, R17)
- LS 1.3 Responds to questions (HM-TM 43U)
- LS 1.5 Organize Ideas (HM-TM 50, 63)
- S 3.a Plant and Animal Structures (HM-TM R23-R25)
- S 5.e Collect and analyze data (HM-TM R23-R25)

Theme Paperbacks

Grow! A Book About Bears, by Melvin Berger (Easy)
Rain Forests Babies, by Kathy Darling (On Level)
In Good Hands, by Stephen R. Swinburne (Challenge)

Science Standards – California

Life Sciences

5. **Adaptations in physical structure or behavior may improve an organism's chance for survival.** As a basis for understanding this concept:
- Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
 - Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
 - 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.
 - Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
 - 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

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

Language Arts Standards - California

Reading: Vocabulary

- R 1.4 Find meaning from context (HM-TM 43-69)

Reading: Comprehension and Analysis of Grade-Level-Appropriate Text:

- R 2.2 Connect with prior knowledge (HM-TM 47-55)
- R 2.3 Identify answers in text (HM-TM 47-55)
- R 2.4 Make and modify predictions (HM-TM 47)
- R 2.6 Extract significant information (HM-TM 47-55)

Writing

- W 2.2 Write descriptions (HM-TM 69M, R17)

Listening and Speaking:

- LS 1.3 Responds to questions (HM-TM 43U)
- LS 1.5 Organize Ideas (HM-TM 50, 63)

Science

- S 3.a Plant and Animal Structures (HM-TM R23-R25)
- S 5.e Collect and analyze data (HM-TM R23-R25)

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Theme 4:
Animal Habitats

A SCHMAHL SCIENCE WORKSHOP

**IMMIGRANT ANIMALS:
HUMPBACK WHALES**

SSW: Workshop 139 BIO

California
STAR CST
Blueprint
Life Sciences
30%

Surfer Seal, by Michael Foreman (HM-TM 43-69)

Vocabulary, Transparency 4-9 (HM-TM 44A)

Comprehension Skill, Compare and Contrast (HM-TM 45C)

HM Objectives:

- R 2.2 Connect with prior knowledge (HM-TM 47-55)
- R 2.3 Identify answers in text (HM-TM 47-55)
- R 2.4 Make and modify predictions (HM-TM 47)
- R 2.6 Extract significant information (HM-TM 47-55)
- W 2.2 Write descriptions (HM-TM 69M, R17)
- LS 1.3 Responds to questions (HM-TM 43U)
- LS 1.5 Organize Ideas (HM-TM 50, 63)
- S 3.a Plant and Animal Structures (HM-TM R23-R25)
- S 5.e Collect and analyze data (HM-TM R23-R25)

Theme Paperbacks

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Rain Forests Babies, by Kathy Darling (On Level)
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Science Standards – California

Life Sciences

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Language Arts Standards - California

Reading: Vocabulary

- R 1.4 Find meaning from context (HM-TM 43-69)

Reading: Comprehension and Analysis of Grade-Level-Appropriate Text:

- R 2.2 Connect with prior knowledge (HM-TM 47-55)
- R 2.3 Identify answers in text (HM-TM 47-55)
- R 2.4 Make and modify predictions (HM-TM 47)
- R 2.6 Extract significant information (HM-TM 47-55)

Writing

- W 2.2 Write descriptions (HM-TM 69M, R17)

Listening and Speaking:

- LS 1.3 Responds to questions (HM-TM 43U)
- LS 1.5 Organize Ideas (HM-TM 50, 63)

Science

- S 3.a Plant and Animal Structures (HM-TM R23-R25)
- S 5.e Collect and analyze data (HM-TM R23-R25)

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Theme 5:
Voyagers

A SCHMAHL SCIENCE WORKSHOP

**Agilent -
Day and Night**
SSW: Workshop #335 AST

California
STAR CST
Blueprint
Physical Science
30%

Across the Wide Dark Sea, by Jean Van Leeuwen (HM-TM 103-139H)

Vocabulary, Transparency 5-1 (HM-TM 109A)

Comprehension Skill, Making Inferences (HM-TM 109C)

HM Objectives:

- R 2.2 Connect with prior knowledge (HM-TM 108)
- R 2.3 Identify answers in text (HM-TM 121)
- R 2.4 Make and modify predictions (HM-TM 110, 131)
- R 2.6 Extract significant information (HM-TM 109B, 117, 125)
- W 1.3 Understand reference materials (HM-TM 137I)
- W 2.3 Write descriptions (HM-TM 137)
- LS 1.3 Responds to questions (HM-TM 120-131)
- LS 1.8 Enhance presentations with props (HM-TM R-15)
- LS 2.3 Make descriptive presentations (HM-TM 137Q)
- S 5.e Collect and analyze data (HM-TM R 26-27)

Theme Paperbacks
(TM103C)

The Josefina Story Quilt, by Eleanor Coerr (Easy)
A Child's Glacier Bay, by Kimberly Corral (On Level)
Balto and the Great Race, Elizabeth Cody Kimmel (Challenge)

Science Standards – California

Physical Sciences

1. Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept:
 - a. *Students know* energy comes from the Sun to Earth in the form of light.
4. Light has a source and travels in a direction. As a basis for understanding this concept:
 - a. *Students know* sunlight can be blocked to create shadows.
 - d. *Students know* an object is seen when light traveling from the object enters the eye.

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

Language Arts Standards – California

Reading: Vocabulary

- R 1.4 Find meaning from context (HM-TM)

Reading: Comprehension and Analysis of Grade-Level-Appropriate Text:

- R 2.2 Connect with prior knowledge (HM-TM 108)
- R 2.3 Identify answers in text (HM-TM 121)
- R 2.4 Make and modify predictions (HM-TM 110, 131)
- R 2.6 Extract significant information (HM-TM 109B, 117, 125)

Writing:

- W 1.3 Understand reference materials (HM-TM 137I)
- W 2.3 Write descriptions (HM-TM 137)

Listening and Speaking:

- LS 1.3 Responds to questions (HM-TM 120-131)
- LS 1.8 Enhance presentations with props (HM-TM R-15)
- LS 2.3 Make descriptive presentations (HM-TM 137Q)

Science:

- S 5.e Collect and analyze data (HM-TM Cross curricular Activities, R 26-27)

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Theme 5:
Voyagers

A SCHMAHL SCIENCE WORKSHOP

Penguins

SSW: Workshop #203 BIO

California
STAR CST
Blueprint
Live Sciences
30%

Trapped By The Ice, by Michael McCurdy (HM-TM 168-205)

Vocabulary, Transparency 15-17 (HM-TM 169A)

Comprehension Skill, Text Organization (HM-TM 169C)

HM Objectives:

- R 2.1 Locate information in text (HM-TM 187)
- R 2.2 Connect with prior knowledge (HM-TM 170-183)
- R 2.3 Identify answers in text (HM-TM 170-183)
- R 2.4 Make and modify predictions (HM-TM 184-199)
- R 2.6 Extract significant information (HM-TM 184-199)
- W 2.2 Write descriptions (HM-TM R13, R26)
- LS 1.3 Responds to questions (HM-TM 199)
- LS 2.3 Make descriptive presentations (HM-TM 137Q)
- S 1.f Evaporation and melting (HM-TM 201)

Theme Paperbacks
(TM103C)

The Josefina Story Quilt, by Eleanor Coerr (Easy)
A Child's Glacier Bay, by Kimberly Corral (On Level)
Balto and the Great Race, Elizabeth Cody Kimmel (Challenge)

Science Standards – California

Life Sciences:

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 - 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.
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Investigation and Experimentation

10. **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:
- e. Collect data in an investigation and analyze those data to develop a logical conclusion.

Language Arts Standards – California

Reading: Vocabulary

- R 1.4 Find meaning from context (HM-TM 169A)

Reading: Comprehension and Analysis of Grade-Level-Appropriate Text:

- R 2.1 Locate information in text (HM-TM 187)
- R 2.2 Connect with prior knowledge (HM-TM 170-183)
- R 2.3 Identify answers in text (HM-TM 170-183)
- R 2.4 Make and modify predictions (HM-TM 184-199)
- R 2.6 Extract significant information (HM-TM 184-199)

Writing:

- W 2.2 Write descriptions (HM-TM R13, R26)

Listening and Speaking:

- LS 1.3 Responds to questions (HM-TM 199)
- LS 2.3 Make descriptive presentations (HM-TM 137Q)

Science:

- S 1.f Evaporation and melting (HM-TM 201)



A SCHMAHL SCIENCE WORKSHOP

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CALIFORNIA STANDARDS SCIENCE TEST THIRD GRADE CONTENT STANDARDS

Physical Sciences – Grade 3

1. Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept:
 - a. *Students know* energy comes from the Sun to Earth in the form of light.
 - b. *Students know* sources of stored energy take many forms, such as food, fuel, and batteries.
 - c. *Students know* machines and living things convert stored energy to motion and heat.
 - d. *Students know* energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.
 - e. *Students know* matter has three forms: solid, liquid, and gas.
 - f. *Students know* evaporation and melting are changes that occur when the objects are heated.
 - g. *Students know* that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.
 - h. *Students know* all matter is made of small particles called atoms, too small to see with the naked eye.
 - i. *Students know* people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of the elements.
2. Light has a source and travels in a direction. As a basis for understanding this concept:
 - a. *Students know* sunlight can be blocked to create shadows.
 - b. *Students know* light is reflected from mirrors and other surfaces.
 - c. *Students know* the color of light striking an object affects the way the object is seen.
 - d. *Students know* an object is seen when light traveling from the object enters the eye.

Schmah Science Workshops

Sun Science (48 AST) Students learn about the physical and chemical properties of the sun.

Science Standards: 1a, 4a, 4c, 4d, 4e

Light and Mirrors (154 PHY) Different surfaces reflect light in varying degrees. A smooth white surface reflects light well. Mirrors have smooth, shiny surfaces that light bounces off in exactly the pattern as it arrives, reflecting a complete image or picture of any object. Dark and matte black surfaces reflect very little light, absorbing most of it.

Science Standards: 2a, 2b, 2c, 2d

CALIFORNIA STANDARDS SCIENCE TEST
THIRD GRADE CONTENT STANDARDS

Schmahl Science Workshops continued

Agilent - Night and Day (335 AST) [HM Theme 5](#) The *Night and Day* workshop provides students with materials to construct a model of the earth-sun system and to observe the causes behind the change from night to day ... and from day to night. They observe why countries experience daylight at different times and be able to determine how often and in which direction the earth rotates on its axis. In the second half of the session, students position their flashlights such that they can model the earth-sun relationship that produces the changing seasons. The beautiful finished model is artistic and will provide a fascinating take-home model for continued investigations at home.

Science Standards: 1a, 4a, 4d, 4e

Liquid Nitrogen and State of Matter (11 CHE) Liquid Nitrogen is an extremely cold, liquefied gas. It can be used to demonstrate lots of interesting effects from superconductivity to the properties of gases & liquids, and a whole lot more! We use liquid nitrogen to investigate how cold temperatures affect materials. We also discuss the phases of matter and how the Kinetic Theory of Gases models these phases.

Science Standards: 1e 1f, 1g, 1h, 1i

Air Moves (103 EAR) [HM Theme 4](#) Using our flow density demonstrator, solar wind bag and singing pipe, students will learn that hot air rises and cold air sinks. Students won't believe their eyes as they explore the powerful properties of air as you put marshmallows to the pressure test. Students are challenged to use Bernoulli's Principle to blow up an 8-foot long bag. With a little practice they are able to inflate the bag using only one breath!

Science Standards: 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i

Water Cycle (123 EAR) [HM Theme 4](#) Air pressure can tell us about what kind of weather to expect as well. If a *high pressure system* is on its way, often you can expect higher temperatures and clear skies. If a *low pressure system* is coming, then look for colder weather, storms and rain. Our workshops introduce the concept of cloud formation and the conditions necessary for precipitation. The students will start with a quick look at part of the water cycle, and the combined gas laws. They then progress through a hands-on/minds-on activity demonstrating the combined gas laws. Our experiments lead them through the conditions necessary for cloud formation. Students learn that weather can be observed, measured, and described. Students learn that water is a resource that needs to be conserved.

Science Standards: 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i

Countertop Science: Pancakes, Marshmallows & Alka Seltzer (231 CHE) In this workshop, students use simple ingredients to see the states of matter as they change from liquid to solid. They are also encouraged to pay attention to the chemistry in everyday cooking. Chemistry is the study of matter and its changes. Many of the changes that occur in cooking can be considered a form of chemistry.

Science Standards: 1e, 1f, 1g, 1h, 1i

Schmahl Science Workshops continued

Air and Water (181 CHE) [HM Theme 4](#) Air pressure can tell us about what kind of weather to expect as well. If a *high pressure system* is on its way, often you can expect higher temperatures and clear skies. If a *low pressure system* is coming, then look for colder weather, storms and rain. Our workshops introduce the concept of cloud formation and the conditions necessary for precipitation. The students will start with a quick look at part of the water cycle, and the combined gas laws. They then progress through a hands-on/minds-on activity demonstrating the combined gas laws. Our experiments lead them through the conditions necessary for cloud formation. Students learn that weather can be observed, measured, and described. Students learn that water is a resource that needs to be conserved.

Science Standards: 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i

Experiments in Electrochemistry (314 CHE) In 1791 Luigi Galvani discovered electrical activity in the nerves of the frogs that he was dissecting. He thought that electricity was of animal origin and could be found only in living tissues. A few years later, in 1800 Alessandro Volta discovered that electricity could be produced through inorganic means. In fact, by using small sheets of copper and zinc and cloth spacers soaked in an acid solution, he built a battery - the first apparatus capable of producing electricity. Naysayers were quick to predict that electricity would never serve a useful purpose. Obviously they were very wrong. Electricity has a central role in our lives and to this day Electrochemistry is a standard course of study. Students apply concepts relating to electrochemistry by constructing a fruit-powered battery. This workshop is designed to compliment/reinforce discussion of concepts regarding electricity and chemistry (e.g., ions, electrolytes, voltage, & batteries).

Science Standards: 1b, 1c, 1d, 1g, 1h, 1i, 2a, 2b, 2c, 2d

Agilent - Periscopes/Pinhole Cameras () Our Agilent Periscope project introduces students to the basic properties of reflection. They experiment with mirrors, reflecting geometric shapes and symmetrical words and images. The children will construct their own periscope and have a great time finding ways to apply the tool.

Science Standards: 2a, 2b, 2c, 2d

Air Pressure Assessment (28 PHY) [HM Theme 4](#) Students learn that air takes up space and has weight. They learn about some basic principles about pressure and discover how pressure and temperature differences cause air to move. Students learn that the wind that transports pollutants in the air and dilutes the pollution on the way. Knowledge of wind speed and direction can help you calculate in which direction pollution will travel and how much they will mix with the unpolluted air.

Science Standards: 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i

Swirling Colors (58 AST) - A water/air interface is an interface between two fluids where the higher-density fluid (water) is a liquid and the lower-density fluid (air) is a gas. This *liquid/gas interface* is extremely familiar to us. The surface of a pond, a glass of water, or the ocean are common examples. A water/air interface is "Rayleigh-Taylor unstable" when the high-density fluid (water) is above the lower density fluid (air).

Science Standards: 1a, 4a, 4c, 4d, 4e

CALIFORNIA STANDARDS SCIENCE TEST
THIRD GRADE CONTENT STANDARDS

Life Sciences – Grade 3

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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 - 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.

Schmahl Science Workshops:

Water, Water Everywhere and Not a Drop to Drink (EAR 18) **HM-TH 4** Students do a variety of experiments that will demonstrate the properties of water and the effects of water pollution.

Science Standards: 3a, 3c, 3d, 4a, 4b, 4d, 4e

Pond Water Tour (45 BIO) Using microscopes, students explore the different types of protozoa, and their microhabitats. Students learn how to prepare wet mounts for microscopic examination; how to prepare hay infusions and cultured protozoa; how to stain specimens.

Science Standards: 3a, 3b, 3c, 3d,

Spiders (5 BIO) This workshop helps students appreciate the place spiders have in the world and will lessen the fear of spiders caused by misunderstandings. There are more than 30,000 different types of spiders known to scientists! Most of them are very tiny animals that help people by eating insects. Spiders are not insects. Students will learn the physical differences between insects and arachnids and also study other distinct characteristics of spiders. Students will know different spiders inhabit different environments and have external features that help them thrive in different kinds of places. Students investigate how spiders perceive the world. Students learn to differentiate among different scents; and learn to interpret shapes from the sense of touch.

Science Standards: 3a, 3b, 3c, 3d,

Earthwork Dissection (232 BIO) Students work in groups of four to conduct experiments related to the behaviors and adaptations that earthworms have developed for survival in the environment. Students create their own ecosystems with sand, soil, live earthworms, and real plants in a 2-litre pop bottle. Everyone also learns the components of soil. Students learn how to culture soil microbes.

Science Standards: 3a, 3b, 3c, 3d

Schmahl Science Workshops continued

National Parks - Badlands (23 EAR) The history of the White River Badlands as a significant paleontological resource goes back to the traditional Native American knowledge of the area. The Lakota found large fossilized bones, fossilized seashells and turtle shells. They correctly assumed that the area had once been under water, and that the bones belonged to creatures which no longer existed.

Science Standards: 3a, 3b, 3c, 3d, 3e

Wolves (25 BIO) Students learn the social behavior, physiology, and anatomy of wolves. They also learn how to identify animals from their teeth.

Science Standards: 3a, 3b, 3c, 3d, 3e

Fossils (30 BIO) How does a living thing become a fossil? The mysterious processes by which evidence of past life is preserved will be explored. By thinking about and participating in some simulated sedimentary processes, children are able to remove much of the mystery behind fossils and fossilization.

Science Standards: 3a, 3b, 3c, 3d, 3e

Traveling Seeds (36 BIO) Millions of seeds are produced from a variety of plants. The seeds are the beginning of life for future species of the same plant. The challenge to plant survival is moving the seed to a suitable germination site. Many plants disperse the seeds through wind, water, or unique vectors (animals that carry the seeds and pollen). Some plants are unique in their means of regenerating. Through hands-on activities, students become familiar with methods of seed dispersal.

Science Standards: 3a, 3b, 3c, 3d, 3e

Whales (38 BIO) [HM Theme 4](#) We will bring whales to life with hands-on projects like using tuning forks and water bags to understand echolocation; and looking at bubbles and vortices using tornado tubes to understand how whales eat using their baleen. If your child has an interest in whales this is one workshop you won't want to miss.

Science Standards: 3a, 3b, 3c, 3d, 3e

Amphibians (88 BIO) Students learn about sound, osmosis, fluid dynamics, fresh water ecology, bone; amphibian muscle structure, evolution and anatomy.

Science Standards: 3a, 3b, 3c, 3d, 3e

Schmahl Science Workshops continued

Immigrant Animals - Spiders (71 BIO) This workshop will help students to appreciate the place spiders have in the world and will lessen the fear of spiders caused by misunderstandings. There are more than 30,000 different types of spiders known to scientists! Most of them are very tiny animals that help people by eating insects. Spiders are not insects. Students will learn the physical differences between insects and arachnids and also study other distinct characteristics of spiders.

Science Standards: 3a, 3b, 3c, 3d, 3e

Insect Adaptations (also Butterflies) (128 BIO) Insects are everywhere in the world around us. Insects live in more different kinds of places than any other group of animals. They live in deserts, in forests, on tops of mountains, in rainforests, in water, in caves, and even in frozen places like Antarctica. They live in books and in clothes, under tree bark, in pools of petroleum, and even inside other animals. They come in many sizes, shapes, and colors.

Through our fun, hands-on activities students learn:

- Insect bodies are divided into three parts: the head, the thorax, and the abdomen.
- Most insects have compound eyes that are made up of hundreds of tiny lenses.
- There are four kinds of insect mouths: chewing (like a grasshopper), piercing (like a mosquito), sucking (like a butterfly), and sponging (like a fly).
- Insects do not have regular ears. Sounds are really just vibrations in the air. Most insects detect sounds by hairs on their bodies that can pick up these vibrations. Some insects use their antennae to pick up vibrations.

Science Standards: 3a, 3b, 3c, 3d,

Owl Pellets - Rodents (156 BIO and 194 BIO) This hands-on experiment allows students to investigate the food web, identify animal skeletons, and practice dissecting skills. Each student dissects an owl pellet and classifies the remains using a bone-sorting chart.

Science Standards: 3a, 3b, 3c, 3d, 3e

Zena the Cow Warrior (186 BIO) What do you get when you mix students, a teacher and a pile of bleached bones? You get Zena, Warrior Cow. (1.5 hour workshop)

Science Standards: 3a, 3b, 3c, 3d

Bird Beak Adaptations (189 BIO) HM Theme 4 Children are given the opportunity to experiment using tools that are similar to various birds' beaks to accomplish the challenge of picking up different types of food. They learn about the shapes, sizes, and operations of bird beaks and how they are adapted to their environments.

Science Standards: 3a, 3b, 3c, 3d, 3e

Rotting Logs: Lessons in Decomposition (233 BIO) The activities in this workshop introduce students to the cyclic causal pattern involved in decay. Students build the ideal habitat for creatures such as crickets, earthworms, millipedes, snails, slugs, beetles, and bacteria, fungi, and actinomycetes.

Science Standards: 3a, 3b, 3c, 3d, 3e

Schmahl Science Workshops continued

Square Foot Gardening - Students create garden beds that are divided into square foot areas. Students grow relatively large numbers of plants together in one square, following the given spacing guides. Row planting was mainly developed for modern agriculture; this isn't needed in back gardens.

Science Standards: 3a, 3b, 3c, 3d, 3e

"Garden To Dye For" - students grow plants that are commonly used to make dyes. In addition, by cultivating native plants we are able to attract butterflies and other insects that were used by the Ohlone Indians in dye making. We believe that our students are able to use the study of natural dyes as a powerful research and educational tool. As an added benefit, as our young people learn to manipulate the dyes as we introduce them to the techniques and principles of organic chemistry.

Science Standards: 3a, 3b, 3c, 3d, 3e

Octopus and Squid Dissection (182 BIO) Students learn basic dissection techniques as they do a step-by-step exploration of the interior and exterior of the squid. They also learn about a squid's habitat, life cycle, and its place in the food chain.

Science Standards: 3a, 3b, 3c, 3d, 3e

Shark Dissection (22 BIO) Compare bony fish anatomy to the anatomy of a shark during dissections, a slimy hands-on experience.

Science Standards: 3a, 3b, 3c, 3d, 3e

Immigrant Animals - Humpback Whales (139 BIO) [HM Theme 4 and 5](#) We will bring whales to life with hands-on projects like using tuning forks and water bags to understand echolocation; and looking at bubbles and vortices using tornado tubes to understand how whales eat using their baleen. If your child has an interest in whales this is one workshop you won't want to miss.

Science Standards: 3a, 3b, 3c, 3d, 3e

Penguins (203 BIO) [HM Theme 5](#) Students learn about buoyancy, heat capacity, fluid dynamics, ocean ecology, and bird anatomy. Students know that different animals inhabit different environments and have external features that help them thrive in different kinds of places.

Science Standards: 3a, 3b, 3c, 3d, 3e

CALIFORNIA STANDARDS SCIENCE TEST
THIRD GRADE CONTENT STANDARDS

Earth Sciences – Grade 3

4. Objects in the sky move in regular and predictable patterns. As a basis for understanding this concept:
- a. *Students know* the patterns of stars stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.
 - b. *Students know* the way in which the Moon's appearance changes during the four-week lunar cycle.
 - c. *Students know* telescopes magnify the appearance of some distant objects in the sky, including the Moon and the planets. The number of stars that can be seen through telescopes is dramatically greater than the number that can be seen by the unaided eye.
 - d. *Students know* that Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.
 - e. *Students know* the position of the Sun in the sky changes during the course of the day and from season to season.

Schmahl Science Workshops:

Sun Science (48 AST) Students learn about the physical and chemical properties of the sun.

Science Standards: 1a, 4a, 4c, 4d, 4e

Agilent – Night and Day (335 AST) The *Night and Day* workshop provides students with materials to construct a model of the earth-sun system and to observe the causes behind the change from night to day ... and from day to night. They observe why countries experience daylight at different times and be able to determine how often and in which direction the earth rotates on its axis. In the second half of the session, students position their flashlights such that they can model the earth-sun relationship that produces the changing seasons. The beautiful finished model is artistic and will provide a fascinating take-home model for continued investigations at home.

Science Standards: 1a, 4a, 4d, 4e

Mystified By The Moon - Eclipses (24 AST)

Science Standards: 4b, 4d, 4e

Planets, Asteroids, and Comets (42 AST) Impact cratering is a process found everywhere in the solar system. Craters are among the most fascinating features of many moons and planets. In this workshop, students experiment to find out more about what causes the various features of impact craters, including the rim of mountains around the edge, and the streaks or rays that fan out from large craters.

Science Standards: 4a, 4c, 4d, 4e

Tops and Planets (130 AST) This workshop introduces students to the underlying principles of gyroscopes. Dramatic demonstrations of gyroscopic precession involve a bicycle wheel held by a volunteer standing on a turntable, a small-scale model, and a child's toy.

Science Standards: 4c, 4d

CALIFORNIA STANDARDS SCIENCE TEST
THIRD GRADE CONTENT STANDARDS

Investigation and Experimentation – Grade 3

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:
- a. Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.
 - 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.
 - 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

Schmahl Science Workshops:

All Schmahl Science Workshops (SSW) are hands-on and are constructed around scientific investigation and experimentation. Each workshop focuses on several aspects of this California Science Standard.

- SSW Workshops stress the development observation skills that can be transferred from to new situations, not only in science but across curricular areas
- SSW Workshops teach students to look at evidence and differentiate fact from opinion
- SSW Workshops teach students how to collect information and data in useable formats
- SSW Workshop help student develop skills in predicting outcomes of simple investigations and compare results with predictions
- SSW Workshops teach students how to collect data in investigations and analyze those data to develop a logical conclusions