

# A SCHMAHL SCIENCE WORKSHOP

GRADE



# 6

HOUGHTON MIFFLIN

# Reading

★ California ★

Grade 6 - Triumphs



# STAR CST

Blueprint For  
Grade 8 Science Test

**A SCHMAHL SCIENCE WORKSHOP**

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Houghton-Mifflin

**GR-6**

Theme 4:

Discovering  
Ancient Cultures

A SCHMAHL SCIENCE WORKSHOP

**AGILENT:**

**TIME SHADOWS - SUNDIAL**

SSW: Workshop #120 AST

California

**STAR CST**

Blueprint

Earth Science

• **8<sup>th</sup> – 12%**

Lost Temple of the Aztecs, by Shelley Tanaka (HM-TM 362 – 386)

Vocabulary: Transparency 4-1

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 362--370)
- R 2.7 Making reasonable assertions (HM-TM 370-378, 380-383)
- R 3.8 Critique credibility (HM-TM 361B, 374, 216-217)
- W 1.3 Choose organization (HM- TM 383M)
- W 2.2 Write expository compositions (HM-TM 383M)
- LS 1.4 Organization and structure (HM-TM 383O)
- LS 1.5 Emphasize salient points (HM-TM 383O)
- LS 1.6 Support opinions (HM-TM 383O)

Science Link:

- Raising Royal Treasures (HM-TM 380-383)
- *Introduction to "A Schmah Science Workshop" Science Fair Program*

Theme Paperbacks

**The Librarian Who Measured the Earth**, by Kathryn Lasky (Easy) (TM-387I)  
**Aida**, by Leontyne Price (On Level) (TM-387K)  
**Between the Dragon and the Eagle**, by Mical Schneider (Challenge) (TM-387M)

## Science Standards – California

Grade 5 Science Standards: Earth Science

5. The solar system consists of planets and other bodies that orbit the Sun in predictable paths. As a basis for understanding this concept:
  - a. *Students know* the Sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.
  - b. *Students know* the solar system includes the planet Earth, the Moon, the Sun, eight other planets and their satellites, and smaller objects, such as asteroids and comets.
  - c. *Students know* the path of a planet around the Sun is due to the gravitational attraction between the Sun and the planet.

## Language Arts Standards - California

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

- R 2.3 Connect/clarify main ideas (HM-TM 362--370)
- R 2.7 Making reasonable assertions (HM-TM 370-378, 380-383)
- R 3.8 Critique credibility (HM-TM 361B, 374, 216-217)

Writing:

- W 1.3 Choose organization (HM- TM 383M)
- W 2.2 Write expository compositions (HM-TM 383M)

Listening and Speaking Strategies:

- LS 1.4 Organization and structure (HM-TM 383O)
- LS 1.5 Emphasize salient points (HM-TM 383O)
- LS 1.6 Support opinions (HM-TM 383O)

Houghton-Mifflin

**GR-6**

Theme 4:  
Discovering  
Ancient Cultures

A SCHMAHL SCIENCE WORKSHOP

**MAKING YOGURT –  
AN ANCIENT  
CHINESE SECRET**

SSW: Workshop #303 BIO

California  
**STAR CST**

Blueprint  
Reactions/Chem.

● **8<sup>th</sup> – 19%**

The Great Wall, by Elizabeth Mann (HM-TM 391-397)

Vocabulary: Transparency 4-9

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 389B, 401-402, 404-407)
- R 2.4 Outlines/notes/summaries (HM-TM 389B, 407C , 393)
- R 2.7 Making reasonable assertions (HM-TM 391-397, 398-401, 404-407, 395)
- W 2.1 Write narratives (HM- TM 402)
- W 2.2 Write expository compositions (HM-TM 407M)
- LS 2.5 Problems and solutions (HM-TM R11)

Science Link:

- *Between the Dragon and the Eagle* (HM-TM 387M-387N)
- *Introduction to “A Schmahl Science Workshop” Science Fair Program*

Theme Paperbacks

*The Librarian Who Measured the Earth*, by Kathryn Lasky (Easy) (TM-387I)

*Aida*, by Leontyne Price (On Level) (TM-387K)

*Between the Dragon and the Eagle*, by Mical Schneider (Challenge) (TM-387M)

**Science Standards – California**

**Grade 8: Reactions and Chemistry of Living Things**

5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
- Students know* reactant atoms and molecules interact to form products with different chemical properties.
  - Students know* chemical reactions usually liberate heat or absorb heat. .
  - Students know* how to determine whether a solution is acidic, basic, or neutral.
6. Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:
- Students know* that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.
  - Students know* that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.
  - Students know* that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA.

**Language Arts Standards - California**

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

- R 2.3 Connect/clarify main ideas (HM-TM 389B, 401-402, 404-407)
- R 2.4 Outlines/notes/summaries (HM-TM 389B, 407C , 393)
- R 2.7 Making reasonable assertions (HM-TM 391-397, 398-401, 404-407, 395)

Writing:

- W 2.1 Write narratives (HM- TM 402)
- W 2.2 Write expository compositions (HM-TM 407M)

Listening and Speaking Strategies:

- LS 2.5 Problems and solutions (HM-TM R11)

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**GR-6**

Theme 4:

Discovering  
Ancient Cultures

A SCHMAHL SCIENCE WORKSHOP

**SILKWORMS**

SSW: Workshop #188 BIO

California

**STAR CST**

Blueprint

Invest. & Exper.

• **8<sup>th</sup> – 10%**

The Great Wall, by Elizabeth Mann (HM-TM 391-397)

Vocabulary: Transparency 4-9

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 389B, 401-402, 404-407)
- R 2.4 Outlines/notes/summaries (HM-TM 389B, 407C , 393)
- R 2.7 Making reasonable assertions (HM-TM 391-397, 398-401, 404-407, 395)
- W 2.1 Write narratives (HM- TM 402)
- W 2.2 Write expository compositions (HM-TM 407M)
- LS 2.5 Problems and solutions (HM-TM R11)

Science Link:

- Between the Dragon and the Eagle (HM-TM 387M-387N)
- Introduction to “A Schmah Science Workshop” Science Fair Program

Theme Paperbacks

The Librarian Who Measured the Earth, by Kathryn Lasky (Easy) (TM-387I)

Aida, by Leontyne Price (On Level) (TM-387K)

Between the Dragon and the Eagle, by Mical Schneider (Challenge) (TM-387M)



## Science Standards – California

Grade 7 Science Standards: Investigations 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:
  - 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.
  - b. Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.
  - c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
  - d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
  - e. Communicate the steps and results from an investigation in written reports and oral presentations.

## Language Arts Standards - California

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

- R 2.3 Connect/clarify main ideas (HM-TM 389B, 401-402, 404-407)
- R 2.4 Outlines/notes/summaries (HM-TM 389B, 407C , 393)
- R 2.7 Making reasonable assertions (HM-TM 391-397, 398-401, 404-407, 395)

Writing:

- W 2.1 Write narratives (HM- TM 402)
- W 2.2 Write expository compositions (HM-TM 407M)

Listening and Speaking Strategies:

- LS 2.5 Problems and solutions (HM-TM R11)

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**GR-6**

Theme 4:  
Discovering  
Ancient Cultures

A SCHMAHL SCIENCE WORKSHOP

**SPICY INHIBITORS**

SSW: Workshop #301 BIO

California  
**STAR CST**

Blueprint  
Invest. & Exper.  
● 8<sup>th</sup> – 10%

The Great Wall, by Elizabeth Mann (HM-TM 391-397)

Vocabulary: Transparency 4-9

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 389B, 401-402, 404-407)
- R 2.4 Outlines/notes/summaries (HM-TM 389B, 407C , 393)
- R 2.7 Making reasonable assertions (HM-TM 391-397, 398-401, 404-407, 395)
- W 2.1 Write narratives (HM- TM 402)
- W 2.2 Write expository compositions (HM-TM 407M)
- LS 2.5 Problems and solutions (HM-TM R11)

Science Link:

- *Between the Dragon and the Eagle* (HM-TM 387M-387N)
- *Introduction to “A Schmah Science Workshop” Science Fair Program*

Theme Paperbacks

*The Librarian Who Measured the Earth*, by Kathryn Lasky (Easy) (TM-387I)  
*Aida*, by Leontyne Price (On Level) (TM-387K)  
*Between the Dragon and the Eagle*, by Mical Schneider (Challenge) (TM-387M)

## Science Standards – California

Grade 7 Science Standards: Investigations and Experimentation

8. 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:
- Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
  - Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.
  - Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
  - Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
  - Communicate the steps and results from an investigation in written reports and oral presentations.

## Language Arts Standards - California

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

- R 2.3 Connect/clarify main ideas (HM-TM 389B, 401-402, 404-407)
- R 2.4 Outlines/notes/summaries (HM-TM 389B, 407C , 393)
- R 2.7 Making reasonable assertions (HM-TM 391-397, 398-401, 404-407, 395)

Writing:

- W 2.1 Write narratives (HM- TM 402)
- W 2.2 Write expository compositions (HM-TM 407M)

Listening and Speaking Strategies:

- LS 2.5 Problems and solutions (HM-TM R11)

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**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**MARS:  
SPACE EXPLORATION  
DESIGN CHALLENGE**

SSW: Workshop #27 HIS

California  
**STAR CST**

Blueprint  
Invest. & Exper.

• **8<sup>th</sup> – 10%**

The Adventure of Sojourner, by Susi Traubmann Wunsch (HM-TM 544A– 569R)

Vocabulary: Transparency 6-1

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 550-557)
- R 2.7 Making reasonable assertions (HM-TM 551-563)
- W 1.2 Create compositions (HM-TM 564)
- W 1.3 Choose organization (HM- TM 564-569N)
- W 2.2 Write compositions (HM-TM 564, R34-R35)

Science Link:

- S 7.a Develop a hypothesis (HM-TM R36-R37)
- S 7.b Perform tests/collect data (HM-TM R36-R37)
- *Introduction to “A Schmahl Science Workshop” Science Fair Program*

Theme Paperbacks (TM-543C)

**Mystery Caves**, by Joan Banks (Read Aloud)  
**Shannon Lucid: Space Ambassador**, by Carmen Bredeson (Easy)  
**Adventure In Space: The Flight to Fix the Hubble**, by Elaine Scott (On Level)  
**Deep Sea Explorer: The Story of Robert Ballard, Discoverer of the Titanic**, by Rick Archbold (Challenge)

**Science Standards – California**

**Grade 6 Science Standards: Investigations 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:
- Develop a hypothesis.
  - Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
  - Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.
  - Communicate the steps and results from an investigation in written reports and oral presentations.
  - Recognize whether evidence is consistent with a proposed explanation.
  - Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map.

**Language Arts Standards - California**

Reading: Vocabulary and Concept Development

- R 1.4 Find meaning from context (HM-TM 550-562)

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

- R 2.3 Connect/clarify main ideas (HM-TM 550-557)
- R 2.7 Making reasonable assertions (HM-TM 551-563)

Writing:

- W 1.2 Create compositions (HM-TM 564)
- W 1.3 Choose organization (HM- TM 564-569N)
- W 2.2 Write compositions (HM-TM 564, R34-R35)

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**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**WHEELS AND AXELS:  
NEWTON CARS**

SSW: Workshop #104 ENG

California  
**STAR CST**

Blueprint

Invest. & Exper.

• **8<sup>th</sup> – 10%**

The Adventure of Sojourner, by Susi Traubmann Wunsch (HM-TM 544A– 569R)

Vocabulary: Transparency 6-1

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 550-557)
- R 2.7 Making reasonable assertions (HM-TM 551-563)
- W 1.2 Create compositions (HM-TM 564)
- W 1.3 Choose organization (HM- TM 564-569N)
- W 2.2 Write compositions (HM-TM 564, R34-R35)

Science Link:

- S 7.a Develop a hypothesis (HM-TM R36-R37)
- S 7.b Perform tests/collect data (HM-TM R36-R37)
- *Introduction to “A Schmah Science Workshop” Science Fair Program*

Theme Paperbacks (TM-543C)

**Mystery Caves**, by Joan Banks (Read Aloud)  
**Shannon Lucid: Space Ambassador**, by Carmen Bredeson (Easy)  
**Adventure In Space: The Flight to Fix the Hubble**, by Elaine Scott (On Level)  
**Deep Sea Explorer: The Story of Robert Ballard, Discoverer of the Titanic**, by Rick Archbold (Challenge)

## Science Standards – California

### Grade 8 Science Standards: Motion

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.
  - f. *Students know* how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction

## Language Arts Standards - California

Reading: Vocabulary and Concept Development

- R 1.4 Find meaning from context (HM-TM 550-562)

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

- R 2.3 Connect/clarify main ideas (HM-TM 550-557)
- R 2.7 Making reasonable assertions (HM-TM 551-563)

Writing:

- W 1.2 Create compositions (HM-TM 564)
- W 1.3 Choose organization (HM- TM 564-569N)
- W 2.2 Write compositions (HM-TM 564, R34-R35)

Science:

- S 7.a Develop a hypothesis (HM-TM R36-R37)
- S 7.b Perform tests/collect data (HM-TM R36-R37)

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**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**PLANETARY VOLCANOES**

SSW: Workshop #67 AST

California  
**STAR CST**  
Blueprint

Earth Sciences

- 5<sup>th</sup> – 30%
- 8<sup>th</sup> – 12%

The Adventures of Sojourner, by Susi Trautmann Wunsch (HM-TM 548 – 565)

Vocabulary: Transparency 6-1

HM Objectives:

- R 1.4 Find meaning from context (HM-TM 549A)
- R 2.3 Connect/clarify main ideas (HM-TM 549 B and 549C)
- R 2.7 Making reasonable assertions (HM-TM 550)
- R 2.8 Persuasion/.propaganda
- LS 2.3 Oral responses to literature (HM-TM 556)
- W 1.2 Create composition (HM-TM 564-565)
- W 1.3 Choose organization (HM- TM 564-565)
- W 2.2 Write compositions (HM-TM 564-565)

Technology Link:

- Little Brother, Big Idea by Ethan Herberman (HM-TM 566 – 569)
- *Introduction to “A Schmah Science Workshop” Science Fair Program*

Theme Paperbacks (TM-543C)

Mystery Caves, by Joan Banks  
(Read Aloud)  
Shannon Lucid: Space  
Ambassador, by Carmen  
Bredeson (Easy)  
Adventure In Space: The  
Flight to Fix the Hubble, by  
Elaine Scott (On Level)  
Deep Sea Explorer: The Story  
of Robert Ballard, Discoverer  
of the Titanic, by Rick

### Science Standards – California

3<sup>rd</sup> grade: Earth Science

- 4d. Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.

5<sup>th</sup> grade: Reshaping the Earth’s Land Surface

- 5a. 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.
- 5b. The solar system includes the planet Earth, the Moon, the Sun, eight other planets and their satellites, and smaller objects, such as asteroids and comets.

6<sup>th</sup> grade: Shaping Earth’s Surface

- 6d. Earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

### Language Arts Standards - California

Reading: Vocabulary and Concept Development

- R 1.4 Find meaning from context (HM-TM 549A)

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

- R 2.3 Connect/clarify main ideas (HM-TM 549 B and 549C)
- R 2.7 Making reasonable assertions (HM-TM 550)
- R 2.8 Persuasion/.propaganda

Listening and Speaking Strategies:

- LS 2.3 Oral responses to literature (HM-TM 556)

Writing:

- W 1.2 Create composition (HM-TM 564-565)
- W 1.3 Choose organization (HM- TM 564-565)
- W 2.2 Write compositions (HM-TM 564-565)

Houghton-Mifflin

**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**BALLOON ROCKET  
DESIGN CHALLENGE**

SSW: Workshop #3 PHY

California  
**STAR CST**

Blueprint  
Physical Sciences

• **8<sup>th</sup> – 26%**

Franklin R. Chang-Diaz, by Argentina Palacios (HM-TM 574– 586)

Vocabulary: Transparency 6-10

HM Objectives:

- R 2.3 Connect/clarify main ideas (HM-TM 572A-593)
- R 2.4 Outline/notes/summary (HM-TM 593C)
- R 2.7 Making reasonable assertions (HM-TM 574-593)
- W 1.2 Create compositions (HM-TM 593M)
- W 1.3 Choose organization (HM- TM 593M)
- W 2.2 Write compositions (HM-TM 588, R34-R35)
- W 2.3 Write research reports (HM-TM 593M)

Science Link:

- **Build and Launch A Paper Rocket!** (HM-TM 590-593)
- *Introduction to “A Schmah Science Workshop” Science Fair Program*

Theme Paperbacks (TM-543C)

**Mystery Caves**, by Joan Banks (Read Aloud)  
**Shannon Lucid: Space Ambassador**, by Carmen Bredeson (Easy)  
**Adventure In Space: The Flight to Fix the Hubble**, by Elaine Scott (On Level)  
**Deep Sea Explorer: The Story of Robert Ballard, Discoverer of the Titanic**, by Rick Archbold (Challenge)

**Science Standards – California**

Grade 8 Science Standards: **FORCE**

2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
- Students know* a force has both direction and magnitude.
  - Students know* when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.
  - Students know* when the forces on an object are balanced, the motion of the object does not change.
  - Students know* how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.
  - Students know* that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).
  - Students know* the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.
  - Students know* the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system

**Language Arts Standards - California**

Reading: Vocabulary and Concept Development

- R 1.4 Find meaning from context (HM-TM 574-586)

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

- R 2.3 Connect/clarify main ideas (HM-TM 572A-593)
- R 2.4 Outline/notes/summary (HM-TM 593C)
- R 2.7 Making reasonable assertions (HM-TM 574-593)

Writing:

- W 1.3 Choose organization (HM- TM 593M)
- W 2.2 Write compositions (HM-TM 588, R34-R35)
- W 2.3 Write research reports (HM-TM 593M)

Houghton-Mifflin

**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**AGILENT -  
DEEP SEA DIVERS**

SSW: Workshop #122 ENG

California  
**STAR CST**

Blueprint  
Physical Sciences

● 8<sup>th</sup> – 8%

Beneath Blue Waters, by Deborah Kovacks & Kate Madin (HM-TM 594K – 611)

Vocabulary: Transparency 6-18

HM Objectives:

- R 1.4 Find meaning from context (HM-TM 594K-608)
- R 2.3 Connect/clarify main ideas (HM-TM 595B-610)
- R 2.4 Outline/notes/summary (HM-TM 595B-604)
- R 2.7 Making reasonable assertions (HM-TM 596-610)
- LS 2.3 Oral responses to literature (HM-TM 602-608)
- W 1.3 Choose organization (HM- TM 610-611)
- W 2.1 Write narratives (HM-TM 610-611)
- W 2.3 Write research reports (HM-TM 615C-615D)

Science Link:

- Sharks Under Ice (HM-TM 612 – 615D)
- *Introduction to “A Schmahl Science Workshop” Science Fair Program*



Theme Paperbacks (TM-543C)

**Mystery Caves**, by Joan Banks  
(Read Aloud)  
**Shannon Lucid: Space  
Ambassador**, by Carmen  
Bredeson (Easy)  
**Adventure In Space: The  
Flight to Fix the Hubble**, by  
Elaine Scott (On Level)  
**Deep Sea Explorer: The Story  
of Robert Ballard, Discoverer  
of the Titanic**, by Rick  
Archbold (Challenge)

## Science Standards – California

### Grade 8 Science Standards: Density and Buoyancy

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.
  - c. *Students know* the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced.
  - d. *Students know* how to predict whether an object will float or sink.

## Language Arts Standards - California

Reading: Vocabulary and Concept Development

- R 1.4 Find meaning from context (HM-TM 594K-608)

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

- R 2.3 Connect/clarify main ideas (HM-TM 595B-610)
- R 2.4 Outline/notes/summary (HM-TM 595B-604)
- R 2.7 Making reasonable assertions (HM-TM 596-610)

Listening and Speaking Strategies:

- LS 2.3 Oral responses to literature (HM-TM 602-608)

Writing:

- W 1.3 W 1.3 Choose organization (HM- TM 610-611)
- W 2.1 Write narratives (HM-TM 610-611)
- W 2.3 Write research reports (HM-TM 615C-615D)

Houghton-Mifflin

**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**SUBMARINE DESIGN  
CHALLENGE**

SSW: Workshop #122 ENG

California  
**STAR CST**

Blueprint  
Physical Sciences

• **8<sup>th</sup> – 8%**

Beneath Blue Waters, by Deborah Kovacks & Kate Madin (HM-TM 594K – 611)

Vocabulary: Transparency 6-18

HM Objectives:

- R 1.4 Find meaning from context (HM-TM 594K-608)
- R 2.3 Connect/clarify main ideas (HM-TM 595B-610)
- R 2.4 Outline/notes/summary (HM-TM 595B-604)
- R 2.7 Making reasonable assertions (HM-TM 596-610)
- LS 2.3 Oral responses to literature (HM-TM 602-608)
- W 1.3 Choose organization (HM- TM 610-611)
- W 2.1 Write narratives (HM-TM 610-611)
- W 2.3 Write research reports (HM-TM 615C-615D)

Science Link:

- Sharks Under Ice (HM-TM 612 – 615D)
- *Introduction to “A Schmahl Science Workshop” Science Fair Program*



Theme Paperbacks (TM-543C)

Mystery Caves, by Joan Banks  
(Read Aloud)  
Shannon Lucid: Space  
Ambassador, by Carmen  
Bredeson (Easy)  
Adventure In Space: The  
Flight to Fix the Hubble, by  
Elaine Scott (On Level)  
Deep Sea Explorer: The Story  
of Robert Ballard, Discoverer  
of the Titanic, by Rick  
Archbold (Challenge)

**Science Standards – California**

**Grade 8 Science Standards: Density and Buoyancy**

9. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:
- Students know* density is mass per unit volume.
  - Students know* how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.
  - Students know* the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced.
  - Students know* how to predict whether an object will float or sink.

**Language Arts Standards - California**

Reading: Vocabulary and Concept Development

- R 1.4 Find meaning from context (HM-TM 594K-608)

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

- R 2.3 Connect/clarify main ideas (HM-TM 595B-610)
- R 2.4 Outline/notes/summary (HM-TM 595B-604)
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Listening and Speaking Strategies:

- LS 2.3 Oral responses to literature (HM-TM 602-608)

Writing:

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Houghton-Mifflin

**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**SHARK DISSECTION**

SSW: Workshop #22 BIO

California  
**STAR CST**

Blueprint  
Life Sciences

• **8<sup>th</sup> – 5%**

Beneath Blue Waters, by Deborah Kovacks & Kate Madin (HM-TM 594K – 611)

Vocabulary: Transparency 6-18

HM Objectives:

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Science Link:

- Sharks Under Ice (HM-TM 612 – 615D)
- *Introduction to “A Schmahl Science Workshop” Science Fair Program*

Theme Paperbacks (TM-543C)

Mystery Caves, by Joan Banks  
(Read Aloud)  
Shannon Lucid: Space Ambassador, by Carmen Bredeson (Easy)  
Adventure In Space: The Flight to Fix the Hubble, by Elaine Scott (On Level)  
Deep Sea Explorer: The Story of Robert Ballard, Discoverer of the Titanic, by Rick Archbold (Challenge)

## Science Standards – California

3<sup>rd</sup> Grade: Life Science

- 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.

## Language Arts Standards - California

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**GR-6**

Theme 6:  
Oceans & Space

A SCHMAHL SCIENCE WORKSHOP

**SQUID DISSECTION**

SSW: Workshop #182 BIO

California  
**STAR CST**

Blueprint  
Life Sciences  
● 8<sup>th</sup> – 5%

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CALIFORNIA CONTENT STANDARDS: Grade 8	# of Items	%
<b>Motion</b>	<b>8 items</b>	<b>13%</b>
<b>1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:</b>		
a. <i>Students know</i> position is defined in relation to some choice of a standard reference point and a set of reference directions.	1	
b. <i>Students know</i> 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.	1	
c. <i>Students know</i> how to solve problems involving distance, time, and average speed.	2	
d. <i>Students know</i> the velocity of an object must be described by specifying both the direction and the speed of the object.	1	
e. <i>Students know</i> changes in velocity may be due to changes in speed, direction, or both.	1	
f. <i>Students know</i> how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction.	2	
<b>Forces</b>	<b>8 items</b>	<b>13%</b>
<b>2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:</b>		
a. <i>Students know</i> a force has both direction and magnitude.	1	
b. <i>Students know</i> when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.	1	
c. <i>Students know</i> when the forces on an object are balanced, the motion of the object does not change.	1	
d. <i>Students know</i> how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.	2	
e. <i>Students know</i> that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).	1	
f. <i>Students know</i> the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.	1	
g. <i>Students know</i> the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system.	1	

CALIFORNIA CONTENT STANDARDS: Grade 8	# of Items	%
<b>Structure of Matter</b>	<b>9 items</b>	<b>15%</b>
<b>3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:</b>		
a. <i>Students know</i> the structure of the atom and know it is composed of protons, neutrons, and electrons.	2	
b. <i>Students know</i> that compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements.	2	
c. <i>Students know</i> atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers.	1	
d. <i>Students know</i> the states of matter (solid, liquid, gas) depend on molecular motion.	1	
e. <i>Students know</i> that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently.	2	
f. <i>Students know</i> how to use the periodic table to identify elements in simple compounds.	1	
<b>Earth in the Solar System (Earth Science)</b>	<b>7 items</b>	<b>12%</b>
<b>4. The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept:</b>		
a. <i>Students know</i> galaxies are clusters of billions of stars and may have different shapes.	1	
b. <i>Students know</i> that the Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color.	2	
c. <i>Students know</i> how to use astronomical units and light years as measures of distances between the Sun, stars, and Earth.	1	
d. <i>Students know</i> that stars are the source of light for all bright objects in outer space and that the Moon and planets shine by reflected sunlight, not by their own light.	1	
e. <i>Students know</i> the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids.	2	

CALIFORNIA CONTENT STANDARDS: Grade 8	# of Items	%
<b>Reactions</b>	<b>7 items</b>	<b>12%</b>
<b>5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:</b>		
a. <i>Students know</i> reactant atoms and molecules interact to form products with different chemical properties.	1	
b. <i>Students know</i> the idea of atoms explains the conservation of matter: In chemical reactions the number of atoms stays the same no matter how they are arranged, so their total mass stays the same.	2	
c. <i>Students know</i> chemical reactions usually liberate heat or absorb heat.	1	
d. <i>Students know</i> physical processes include freezing and boiling, in which a material changes form with no chemical reaction.	2	
e. <i>Students know</i> how to determine whether a solution is acidic, basic, or neutral.	1	
<b>Chemistry of Living Systems (Life Science)</b>	<b>3 items</b>	<b>5%</b>
<b>6. Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:</b>		
a. <i>Students know</i> that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.	1	
b. <i>Students know</i> that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.	1	
c. <i>Students know</i> that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA.	1	
<b>Periodic Table</b>	<b>7 items</b>	<b>12%</b>
<b>7. The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:</b>		
a. <i>Students know</i> how to identify regions corresponding to metals, nonmetals, and inert gases.	2	
b. <i>Students know</i> each element has a specific number of protons in the nucleus (the atomic number) and each isotope of the element has a different but specific number of neutrons in the nucleus.	2	
c. <i>Students know</i> substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity.	3	

<b>CALIFORNIA CONTENT STANDARDS: Grade 8</b>	<b># of Items</b>	<b>%</b>
<b>Density and Buoyancy</b>	<b>5 items</b>	<b>8%</b>
<b>8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:</b>		
a. <i>Students know</i> density is mass per unit volume.	1	
b. <i>Students know</i> how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.	2	
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.	1	
d. <i>Students know</i> how to predict whether an object will float or sink.	1	
<b>Investigation and Experimentation</b>	<b>6 items</b>	<b>10%</b>
<b>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:</b>		
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.		
d. Recognize the slope of the linear graph as the constant in the relationship $y = kx$ and apply this principle in interpreting graphs constructed from data.		
e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.		
f. Apply simple mathematic relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure x area, volume = area x height).		
g. Distinguish between linear and nonlinear relationships on a graph of data.		
<b>Total</b>	<b>60 items</b>	<b>100%</b>