NANCY LARSON PUBLISHERS

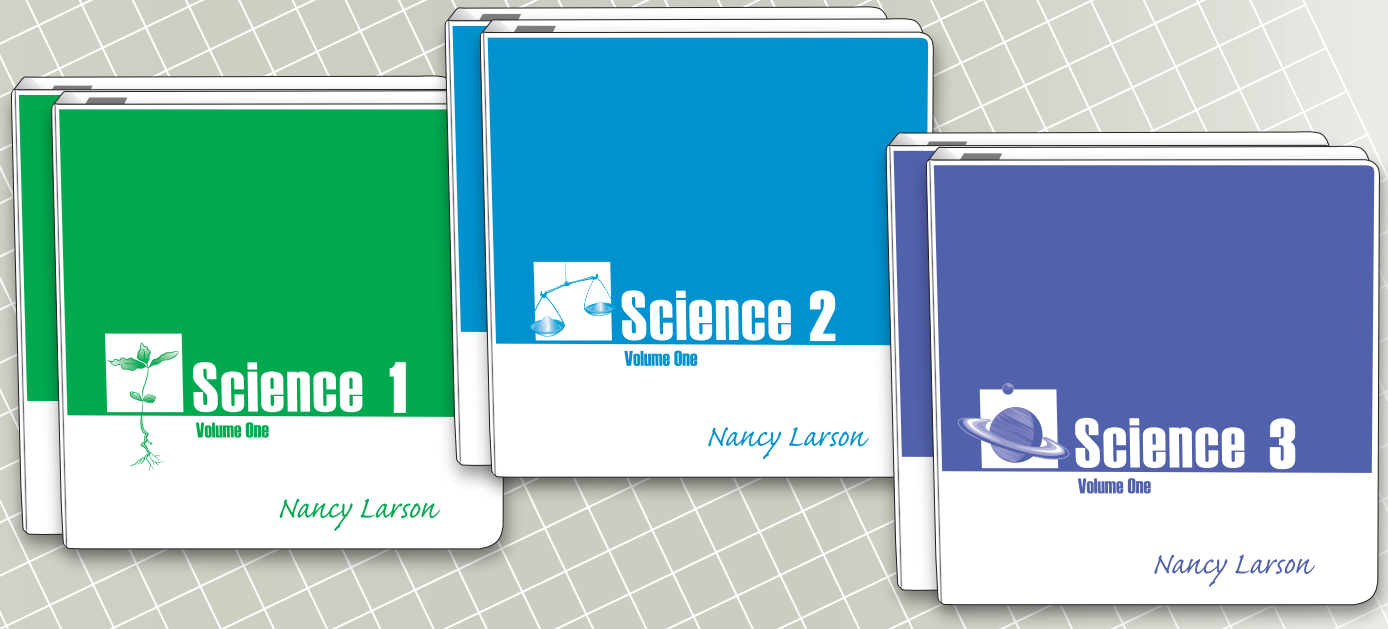
Science

an Elementary Program

1 2 3

by Nancy Larson

Based on National Standards
Develops literacy and vocabulary
Encourages inquiry and exploration
Challenging and engaging content
Experiments and hands-on activities



built-in Student Engagement

the teacher's manual

The teacher's manual in two volumes contains approximately 80 lessons.

The lessons are written as a dialogue so that the teacher can easily use the vocabulary and interact with the students without missing important content.

Each lesson is bound in a booklet that can be taken out of the teacher's manual. Individual lesson booklets allow the teacher to easily move around the classroom.

Life
Physical
Earth and Space

LESSON 13

Observing how matter changes state

Lesson Preparation

Program Materials

- Children's Booklet A *Investigating the Physical Properties of Matter* (p. 11)
- Lesson Chart 13
- Science Word Wall cards *(see inset)*
- Lesson Review 13

Science Word Wall
melts
vaporizes

Teacher Collected Materials

- Electric griddle or frying pan (griddle works better)
- 2 ice cubes
- Clear drinking glass
- Flashlight
- Yellow highlighters (1 per child)

The Lesson

- Post Lesson Chart 13.
- Place the griddle in the center of the demonstration area where all children can easily see the griddle.
- Seat the children in a semicircle at a safe distance from the griddle and begin heating the griddle.

"We have been learning about matter that is a solid, a liquid, and a gas."

"What is an example of matter that is a solid?"

"What is an example of matter that is a liquid?"

"What is an example of matter that is a gas?"

"Ice cream is a solid."

"What happens when you put a dish of ice cream on a table in the sunlight on a hot day?" ***It melts and becomes a liquid.***

"How is the ice cream different when it is a liquid from when it was a solid?" ***It flows and takes the shape of the dish.***

Lesson features & strategies

"What do you think will happen when I put an ice cube in a frying pan and turn on the heat?"

"Let's try this and see.

- Put the second ice cube in the heated frying pan.

"This frying pan is hot."

Observing / *Describing*

"Watch what happens to the ice cube."

"What is happening?" ***The ice cube is melting.***

"When we add heat to the solid ice cube, it changed to liquid water."

"Let's keep heating the water."

- Ask a child to turn off the classroom lights.

"We will use the flashlight to help us see what is happening."

- Shine a flashlight above the surface of the pan.

"What do you see?" ***steam***

Building knowledge

"The liquid water is changing to a gas."

"This gas is called water vapor."

"The water vapor is part of the air now."

"The liquid water vaporized."

- Continue heating the water until there is no water left in the pan.
- Turn off and unplug the frying pan.

Predicting

"We have changed the solid ice cube to liquid water and then to a gas called water vapor."

"What do you predict will happen to the ice cube in the glass during the next week?"

Observing

"We'll observe the glass with the ice cube during the next week to check our predictions."

"Let's record what we observed in our physics booklet."

- Distribute children's Booklet A and a highlighter to each child.

"Keep your highlighter capped until I tell you it is time to use it."

"Open your booklet to page 13."

"What is the title?" ***Changing States of Matter***

- **Teacher Note**: "States of Matter" are also referred to as the "Phases of Matter."

"Point to the words as I read paragraphs 1 through 3."

- Read paragraphs 1 through 3 with the children.

"What are the three states of matter?" ***solid, liquid, and gas***

Highlighting important information

"Let's highlight this sentence in the first paragraph."

"Use your highlighter to draw one line through the sentence 'The three states of matter are solid, liquid, and gas.'"

"What happens when we heat a solid?" ***It melts and becomes a liquid.***

"What are some things that melt when they get warmer?" ***butter, ice cream, chocolate, snow, crayons***

Relating to the real world

"What word in paragraph 2 should we highlight to help us remember this?" ***melting***

"Use your highlighter to draw one line through the word 'melting.'"

"What happens when we heat a liquid?" ***It vaporizes and becomes a gas.***

"What word in paragraph 3 should we highlight to help us remember this?" ***vaporizing***

"Use your highlighter to draw one line through the word 'vaporizing.'"

"Put the cap on your highlighter."

Writing

"Now let's write about what we observed when we heated the ice cube."

"Turn to page 14."

"First we will write about the procedure."

"What did we do in the experiment?" ***We heated an ice cube.***

- Write "We heated an ice cube" on the board.

"Write 'We heated an ice cube' on the first lines in the box."

- Circulate and check the children's booklets.

Representing observations

"In the middle of the page you will draw pictures to show how the ice cube changed before, during, and after the experiment."

"What could you draw?"

- Ask a child to describe how he/she would draw the pictures to show what happened

meaningful **Content**

a natural order of topics

The topics chosen for each grade level reflect the interests and developmental characteristics of primary-age children, offering them a perfect balance of **Life Science**, **Physical Science**, and **Earth and Space Science**.

Science 1 Topics

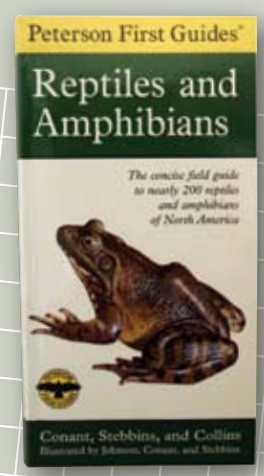
- Describing the Life Stages of Human Beings (Developmental Biology)
- Observing Trees (Botany)
- Exploring Sunlight, Water, and Soil (Earth and Space)
- Investigating Animals and Their Habitats (Zoology)
- Discovering What Is Inside of Our Bodies (Anatomy)
- Examining the Characteristics and Life Cycles of Insects (Entomology)

Science 2 Topics

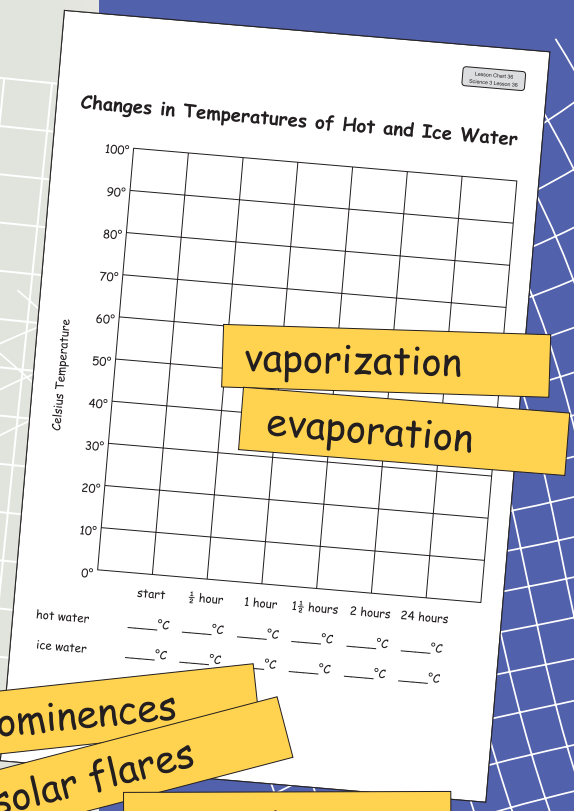
- Investigating the Physical Properties of Matter (Physics)
- Observing Rocks and Minerals (Geology)
- Investigating Forces and Work (Physics)
- Examining Simple Machines (Physics)
- Exploring Sound and Light (Physics)
- Investigating Birds (Ornithology)

Science 3 Topics

- Exploring Our Solar System (Astronomy)
- Investigating Elements and Compounds (Chemistry)
- Observing Physical Changes (Physics)
- Investigating Changes in Our Atmosphere (Meteorology)
- Exploring the Earth's Structure (Geology)
- Examining the Structure and Parts of Seed Plants (Botany)
- Investigating Amphibians and Reptiles (Zoology)



from **Science 3**



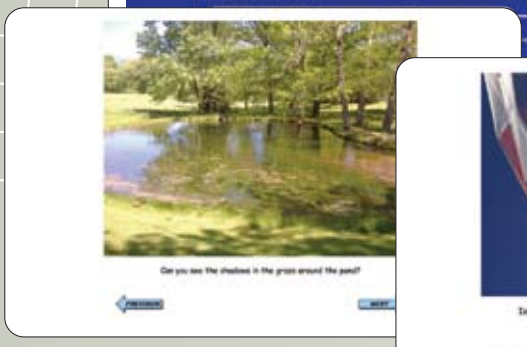
vaporization

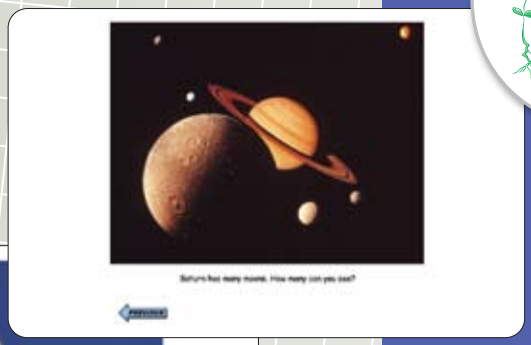
evaporation

prominences

solar flares

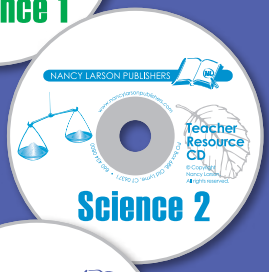
sunspots

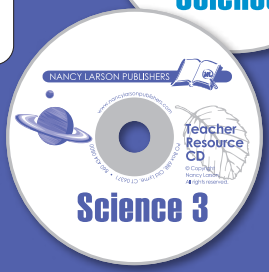




Web Site *activities*

Photographs, links, and teacher resource information are provided on our website. Teacher Resource CDs supply materials to classrooms without web access.





illustrate the **World**

classroom materials

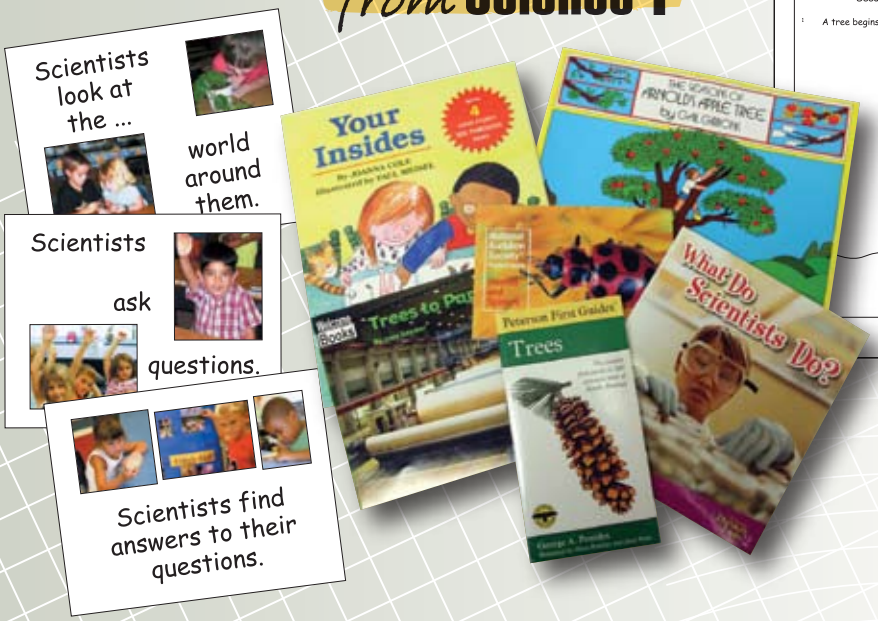
Photo cards, **large charts** of selected student pages, **science word wall cards**, and **teacher resource books** enhance the lessons.

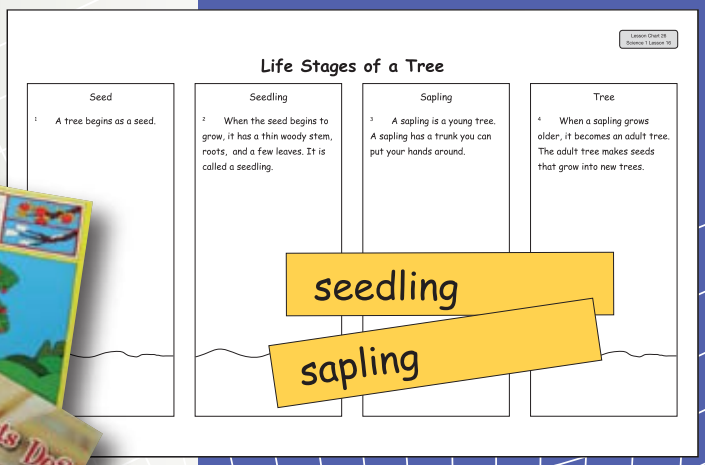
botanist

evergreen

flower

from Science 1

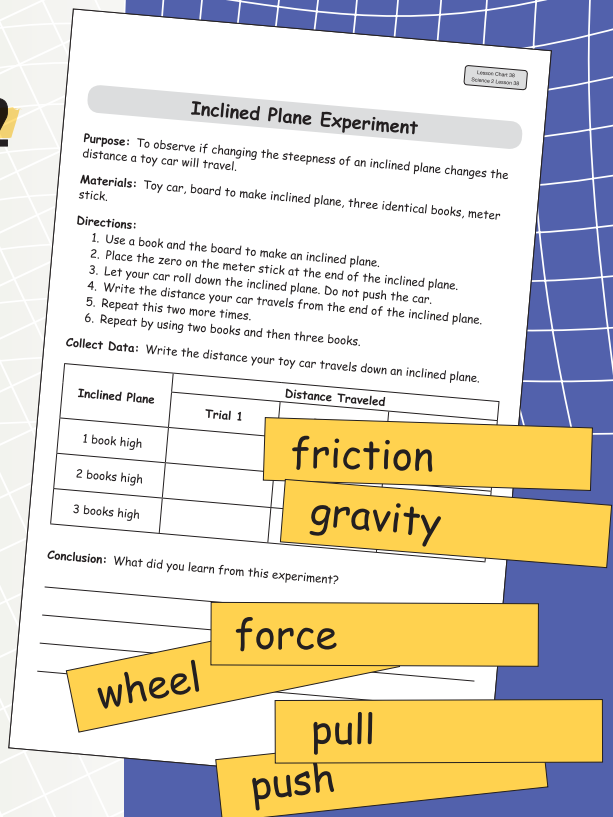




seedling

sapling

from Science 2



friction

gravity

force

wheel

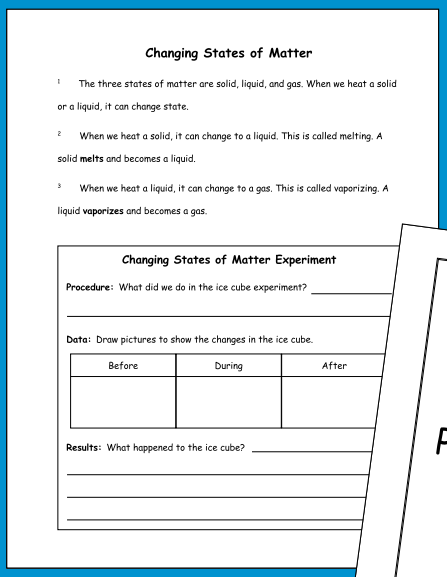
pull

push

all their own **Work**

student materials

Challenging and engaging content is reinforced through ***Student Booklets***, ***Experiment Recording Forms***, ***Data Recording Forms***, ***Lesson Reviews***, ***Study Guides***, and other materials that enhance learning and teaching.



Changing States of Matter

1 The three states of matter are solid, liquid, and gas. When we heat a solid or a liquid, it can change state.

2 When we heat a solid, it can change to a liquid. This is called melting. A solid **melts** and becomes a liquid.

3 When we heat a liquid, it can change to a gas. This is called vaporizing. A liquid **vaporizes** and becomes a gas.

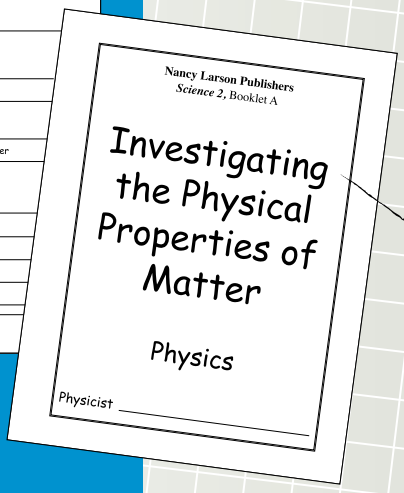
Changing States of Matter Experiment

Procedure: What did we do in the ice cube experiment? _____

Data: Draw pictures to show the changes in the ice cube.

Before	During	After

Results: What happened to the ice cube? _____



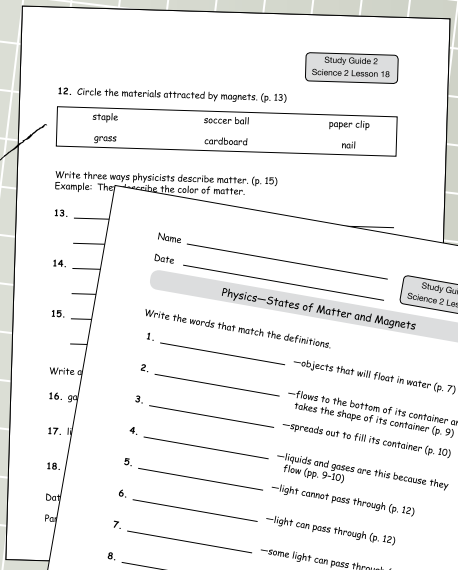
Nancy Larson Publishers
Science 2, Booklet A

Investigating the Physical Properties of Matter

Physics

Physicist _____

Individual Student Booklets allow children to interact with the content. Children read and highlight important information, draw and label diagrams, read charts, and record data.



Study Guide 2
Science 2 Lesson 18

12. Circle the materials attracted by magnets. (p. 13)

staple	soccer ball	paper clip
grass	cardboard	nail

Write three ways physicists describe matter. (p. 15)
Example: They describe the color of matter.

13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

Name _____
Date _____

Study Guide 2
Science 2 Lesson 18

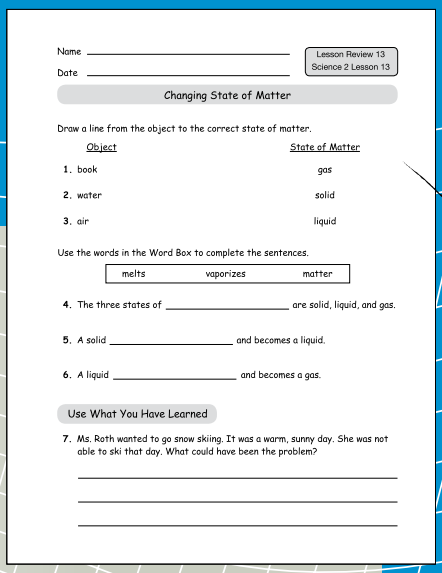
Physics—States of Matter and Magnets

Write the words that match the definitions.

1. _____ —objects that will float in water (p. 7)
2. _____ —flows to the bottom of its container and takes the shape of its container (p. 9)
3. _____ —spreads out to fill its container (p. 10)
4. _____ —liquids and gases are this because they flow (pp. 9–10)
5. _____ —light cannot pass through (p. 12)
6. _____ —light can pass through (p. 12)
7. _____ —some light can pass through (p. 12)
8. _____ —when a solid is heated and changes to a liquid (p. 11)
9. _____ —when a liquid is heated and changes to a gas (p. 11)
10. _____ —metal an object contains if attracted to a magnet (p. 13)
11. Write the letters **N** and **S** on the poles of the magnets to show magnets attracting and repelling. (p. 14)

Repel | Attract

Study Guides provide children with opportunities to review information included in the student booklets.



Name _____
Date _____

Lesson Review 13
Science 2 Lesson 13

Changing State of Matter

Draw a line from the object to the correct state of matter.

Object	State of Matter
1. book	gas
2. water	solid
3. air	liquid

Use the words in the Word Box to complete the sentences.

melts	vaporizes	matter

4. The three states of _____ are solid, liquid, and gas.
5. A solid _____ and becomes a liquid.
6. A liquid _____ and becomes a gas.

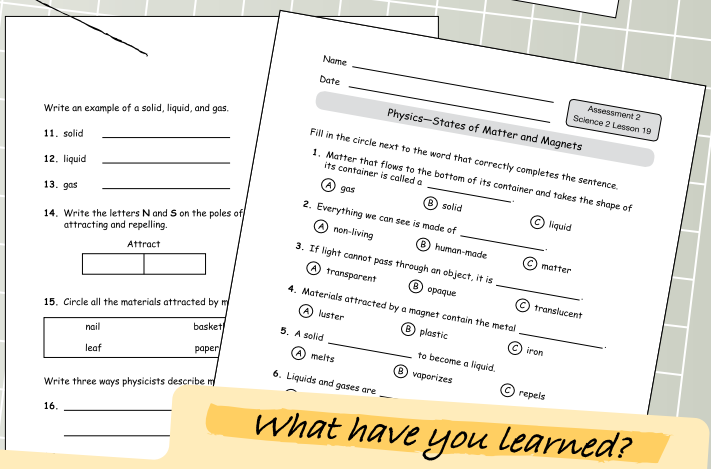
Use What You Have Learned

7. Ms. Rath wanted to go snow skiing. It was a warm, sunny day. She was not able to ski that day. What could have been the problem?

_____
_____
_____

Lesson Reviews contain a wide variety of questions that review the content from that lesson and previous lessons.

Assessments allow teachers to assess children's mastery of information.



Write an example of a solid, liquid, and gas.

11. solid _____
12. liquid _____
13. gas _____
14. Write the letters **N** and **S** on the poles of attracting and repelling.

Attract

15. Circle all the materials attracted by m

nail	basket
leaf	paper

Write three ways physicists describe m

16. _____

Name _____
Date _____

Assessment 2
Science 2 Lesson 19

Physics—States of Matter and Magnets

Fill in the circle next to the word that correctly completes the sentence.

1. Matter that flows to the bottom of its container and takes the shape of its container is called a _____.
   (A) gas (B) solid (C) liquid
2. Everything we can see is made of _____ .
   (A) non-living (B) human-made (C) matter
3. If light cannot pass through an object, it is _____ .
   (A) transparent (B) opaque (C) translucent
4. Materials attracted by a magnet contain the metal _____ .
   (A) luster (B) plastic (C) iron
5. A solid _____ to become a liquid.
   (A) melts (B) vaporizes (C) repels
6. Liquids and gases are _____

What have you learned?

just what your **Classroom Needs**

packaging options

Science 1, ***Science 2***, and ***Science 3*** are available in kits for 24 or 32 students.

all-inclusive *easy to use*

Complete kits contain everything you need for the school year.

- 2-volume Teacher's Edition, including:
  - Approximately 80 lessons
  - Photo Cards
  - Teacher Resource CD
  - Glossaries
- Poster-size Lesson Charts
- Word Wall Cards
- Student Material in quantities of 24 or 32, including:
  - Consumable Science Booklets for each topic
  - Data Recording Forms, Experiments, Computer Activity and Research Project Forms
  - Lesson Review sheets for each lesson
  - Study Guides
  - Assessments
- Science Tool Kit

Next year, order the Refill Kit, which includes:

- Poster-size Lesson Charts
- Word Wall Cards
- Student Material in quantities of 24 or 32, including:
  - Consumable Science Booklets for each topic
  - Data Recording Forms, Experiments, Computer Activity and Research Project Forms
  - Lesson Review sheets for each lesson
  - Study Guides
  - Assessments
- Science Tool Kit Refill

Alternative packaging is available for small classes. Contact us for details.

for ordering information, call or log on:

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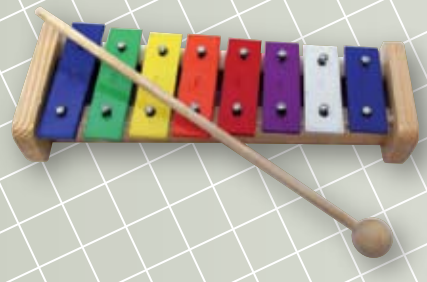
science tool kits

The **Science Tool Kit** for each grade includes all of the hard-to-find and necessary items for demonstrating and exploring the concepts presented in the lessons, enhancing the fun of learning science!

Science 1

Science 2



Science 3