



UNIT 3

B-1: Concepts of Physical Science



KEY VOCABULARY

Culturally Responsive & Place-Based Introduction of Science Vocabulary

MODEL

Place-Based Perspective

Show the students a toy car or other item that is a model of a real item. Discuss scale with the students—if the scale is available for the model, share it with the students. Have the students suggest other models that can be found. In addition, have the students tell the practical uses of models, particularly in the field of construction.

Heritage Cultural Perspective

Traditionally, the Native people of Southeast Alaska created models of clan houses, which were used to construct the actual houses. Dolls were made to represent children and their clothing. In addition, some jewelry forms were models based on actual items, such as ceremonial shields. Models of canoes were created to provide guidance in the making of actual canoes.

MATTER

Place-Based Perspective

Before the lesson begins, locate a jigsaw puzzle. Present the puzzle to the students. Put a few of the pieces together. Use this as an analogy for matter—matter not only relates to mass and volume but to the building blocks within matter (the Particulate Theory of Matter). Have the students identify samples of matter in the classroom.

Heritage Cultural Perspective

Traditionally, Native people viewed all matter as living forms. This included land, water, plants, and wildlife.

STATE

Place-Based Perspective

Place a rock, a container of water, and an inflated balloon in front of the students. Use these to introduce the “state” of matter to the students. The rock—a solid—has a fixed volume and shape; water—a liquid—maintains its volume but adjusts to the shape of its container; air in the balloon is a gas—gas expands to fit whatever volume is available. Have the students cite other samples of solids, liquids, and gases.

Heritage Cultural Perspective

Native people of Southeast Alaska render solid fats, such as seal fat, into oils. When they do this, they are changing the state of the fats from solids to liquids.

Culturally Responsive & Place-Based Introduction of Science Vocabulary

ENERGY

Place-Based Perspective

Place a car model, picture of a cake, a boat model, and a piece of ice in front of the students. Encourage the students to tell what is the same about all of the items. Lead them to understand that all of the items relate to energy—the ability to make changes. Use this to introduce potential and kinetic energy to the students.

Heritage Cultural Perspective

Native people recognized wind and air as forms of energy. The wind was used to propel their sailing canoes. Air and the sun were used to dry meats, fish, plants, and skins. Steam energy was used to create bentwood boxes and canoes.

HEAT

Place-Based Perspective

Show the students unpopped popcorn. Have them suggest how to pop the corn—through the use of heat. Use this to introduce the concept of heat as the transfer of energy through thermal contact. Lead the students to understand that when things are hot, their molecules are moving quickly. Have the students rub their hands together to demonstrate this.

Heritage Cultural Perspective

Traditionally, one way to cook foods involved the digging of a pit. Food would be wrapped in skunk cabbage and covered with a layer of soil. Then, hot rocks would be placed over the soil. The heat from the rocks would cook the food quickly. This method was used to cook fish and meats.

LIGHT

Place-Based Perspective

Before the lesson begins, use a digital camera to take a picture in a dark room (do not use the flash). Show the picture to the students and have them suggest why it didn't turn out well. Lead the students to understand that the earth's light comes from the sun—but man-made light forms also exist. The students should understand that light flows in waves at 669,600,000 miles per hour.

Heritage Cultural Perspective

The traditional story of “The Box of Daylight” explains how daylight came to the world. For details of this story, refer to the grade 6 social studies program, unit 1.

Culturally Responsive & Place-Based Introduction of Science Vocabulary

CHEMICAL

Place-Based Perspective

Place a glass of warm water in front of the students. Show them a teaspoon of salt. Have them predict what will happen to the salt in the warm water—the salt will dissolve. Use this to introduce chemicals and the changes that can occur. Show other examples of substances, such as soap, that can undergo chemical changes.

Heritage Cultural Perspective

Traditionally, moose and seal hides were tanned in the winter when the weather was extremely cold and windy. The skin side was scraped and the whole hide was soaked in water. It was then hung outdoors. When it froze, the ice expanded in the hide, stretching it naturally. The hides were then beaten to soften them. This led to very pliable and odorless skins, which were used to make clothing.

ELECTRICAL

Place-Based Perspective

Show the picture of the fire from page 183, and an electrical appliance, such as a toaster. Have the students suggest the connection between the two. Lead them to understand that both involve electrical energy—the forest fire may be caused by lightning (natural electricity), and the toaster uses man-made electrical energy (hydro or thermal energy).

Heritage Cultural Perspective

Native people have always been aware of the power of lightning. Some traditional stories feature lightning as a central theme. Thunder and lightning in the winter would forecast a mild winter.



LESSONS

Science Language for Success—Lesson 1

Introduce the key science vocabulary, using concrete materials and/or pictures.

LISTENING

Use the Mini Pictures activity page from the Student Support Materials. Have the students cut out the pictures. Say the key words and the students show the pictures.



Let's Move

Identify an appropriate body movement for each vocabulary word. This may involve movements of hands, arms, legs, etc. Practice the body movements with the students. When the students are able to perform the body movements well, say a vocabulary word. The students should respond with the appropriate body movement. You may wish to say the vocabulary words in a running story. When a vocabulary word is heard, the students should perform the appropriate body movement.

Student Support Materials

Have the students work on the activity pages from the Student Support Materials from this unit. Afterward, review their work.

SPEAKING



Actions!

Group the students together in front of you. Perform an action which represents one of the key vocabulary words. The students should say the vocabulary word for the action you perform. Repeat, using a different action for each vocabulary word.

One to Six

Provide each student with two blank flashcards. Each student should then write a number between one and six on each of his flashcards (one number per card). When the students' number cards are ready, toss two dice and call the numbers showing. Any student or students who have those two numbers must then identify a vocabulary picture you show. The students may exchange number cards periodically during this activity.

Picture Bingo

Give the students the mini pictures used earlier. Each student should place them face down on his/her desk. Then, have each student turn one picture face up. Say a vocabulary word. Any student or students who have the picture for that word face up must say a complete sentence using that vocabulary word. Those pictures should then be put to the side and other pictures turned over. Continue in this way until a student or students have no pictures left on their desks.

Science Language for Success—Lesson 2

READING

Introduce the science sight words to the students—match the sight words with the vocabulary pictures. The sight words are included in the Student Support Materials, attached to these lesson plans.



Note: After each unit, mount a set of the unit's words on the walls around the room. Use the "word walls" for review and reinforcement activities.

Face

Mount the sight words around the classroom on the walls, board, and windows. Group the students into two teams. Give the first player in each team a flashlight. Darken the classroom, if possible. Say one of the sight words. When you say "Go," the students should turn their flashlights on and attempt to locate the sight word you said. The first player to do this correctly wins the round. Repeat until all players in each team have participated.

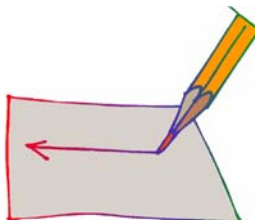
String Along

Join all of the students together with string (the students do not need to move from their seats). Before tying the ends of the string together, insert a roll of tape over one of the ends of the string. Tie the ends of the string together. Turn your back to the students. The students should pass the roll of tape along the string as quickly as possible. When you clap your hands, the student left holding the tape must then identify a sight word you show him. Repeat this process until many students have responded and until all of the sight words have been correctly identified a number of times.

Letter Encode

Give each student his/her envelope that contains the alphabet letters. Mount one of the science pictures on the board. The students must use the cut out letters to spell the word. Review the students' work. Repeat, until all of the words have been spelled in this way.

WRITING

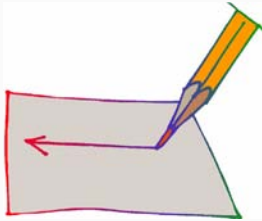


Let's Write

Provide the students with a copy of the creative writing page from the Student Support Materials. The students should write as much as they can about the graphic. Later, have each student read his/her writing to the class.

Science Language for Success—Lesson 2

WRITING (CONTINUED)



Flashlight Writing

If possible, darken the classroom. Give a student a flashlight. Say one of the vocabulary words and the student should write that word with the light of the flashlight on a wall or on the board. Repeat until many students have had a chance to participate. An alternative is to provide each student with writing paper and a pen. Darken the classroom, if possible. Use the light of a flashlight to write one of the sight words on the wall or board. When you have completed the writing of the word, each student should then write the same word on his/her sheet of paper. Repeat until all sight words have been written in this way.

This activity may also be done in team form. In this case, group the students into two teams. Darken the classroom. Use the light of a flashlight to write one of the sight words on the board. When you say “Go,” the first player in each team should rush to the board and use chalk to write the same word on the board. The first player to do this correctly wins the round. Repeat until all players have played.



VOCABULARY PICTURES





CHEMICAL





ELECTRICAL





ENERGY





HEAT





LIGHT





MATTER





MODEL





STATE

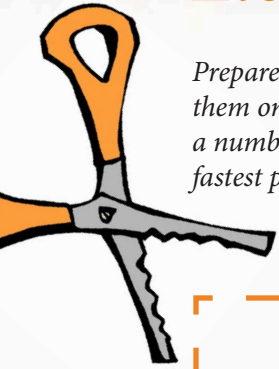


STUDENT SUPPORT MATERIALS

Listening • Mini Pictures

Listening: Mini Pictures

Prepare a copy of these pages for each student. The students should cut out the pictures and lay them on the floor or desk. Say the key words and the students should show you the pictures. Repeat a number of times. This activity can also be done with pairs of students to determine who is the fastest player.



Listening: Mini Pictures







STUDENT SUPPORT MATERIALS

Listening Comprehension

Listening Comprehension



Read the following sentences to the students. The students should circle “true” or “false” for each of the sentences. Review the students’ work.

- | | | |
|---|--------------------------------------------------------------------------------|---------------|
| ① | A model can be made using data from the real object. | True
False |
| ② | Matter can be identified only by using other people’s opinions. | True
False |
| ③ | The state of matter refers to solid, liquid, or gas. | True
False |
| ④ | Energy is what we get when we hypothesize about our environment. | True
False |
| ⑤ | Heat causes the parts of matter to slow down. | True
False |
| ⑥ | Light travels in waves that can be measured. | True
False |
| ⑦ | Chemicals are measurements that are based on identifying the states of matter. | True
False |
| ⑧ | Electrical energy can be natural or man made. | True
False |



STUDENT SUPPORT MATERIALS

Sight Words




state

matter

model





light

heat

energy



electrical

chemical



STUDENT SUPPORT MATERIALS

Basic Reading • Sight Recognition

Sight Words Activity Page

Have the students highlight or circle the words in this word find. Words appear horizontally.



electrical
state

light
energy

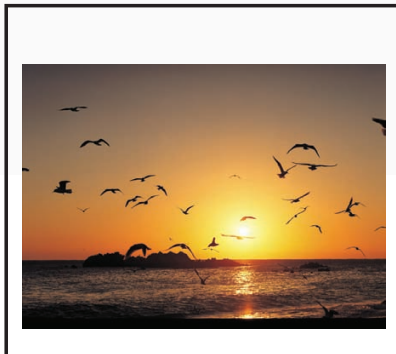
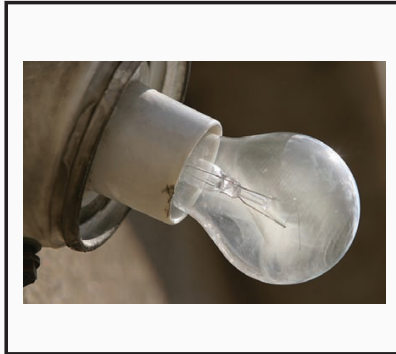
heat
model

matter
chemical

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m e m e t e l h l e c e l m a c g l
e m e s o y y m c h e m i c a l e a
c a c l e c e c e i r a t r a y t r

Sight Words Activity Page

Have the students cut out the key words and glue them at the bottom of their pictures.



model	matter	state	energy
heat	light	chemical	electrical



STUDENT SUPPORT MATERIALS

Basic Reading • Encoding

Encoding Activity Page

Have the students cut out and encode the syllables of the words, OR number the syllables in their correct sequence.



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lec cal tri e

gy ner e



Encoding Activity Page

Have the students cut out the word halves and glue them together to create the key words for this unit.



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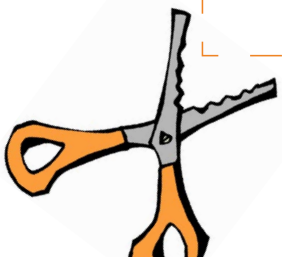
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STUDENT SUPPORT MATERIALS

Reading Comprehension

Reading Comprehension Activity Page

Have the students read the text and then select the correct answer for it. They should fill in the appropriate bullet beside the answer of their choice.



- ① What do models show?
 - They show what chemicals are in our environment.
 - They show the measurements of heat.
 - They show state of matter.
 - They show the shapes of objects.

- ② What is matter?
 - It is the hypothesis that measures the state of an object.
 - It is everything around us.
 - It is the things that we classify based on our opinions.
 - It is what we predict about our environment.

- ③ What is the state of matter?
 - It is the level of heat that is identified.
 - It is the electrical energy that is measured.
 - It is the classification of matter around us.
 - It is the state of energy in a wet environment.

- ④ What is energy?
 - It is the state of matter, measured over time.
 - It is a part of everything that we do.
 - It is the chemical state of an object.
 - It is a model based on a hypothesis.

- ⑤ What does heat do to the parts of matter?
 - It makes the parts move slowly.
 - It measures the state of matter.
 - It identifies the electrical form.
 - It makes the parts move quickly.

Reading Comprehension Activity Page



- ⑥ What is true about light?
- Light is a state of matter that can be measured.
 - Light is matter found in the environment.
 - Light travels in waves.
 - Light communicates facts in our environment.
- ⑦ How would you describe a chemical?
- All chemicals are solids.
 - A chemical is the state of matter in a dry environment.
 - A chemical is a solid, liquid, or gas.
 - A chemical is light waves that can be measured.
- ⑧ What is electrical energy?
- It is the flow of electrical power or charge.
 - It is the matter that is measured by light.
 - It is the state of energy related to chemical changes in matter.
 - It is the matter found only in wet environments.

Reading Comprehension Activity Page

Have the students write the letters for sentence halves that match.



- | | |
|-----------------------------|-----------------------------------------------|
| ① A toy car is | ① that travels fast. |
| ② Matter is | ② are three states of matter. |
| ③ Liquid, solid, or gas | ③ that makes the parts of matter move faster. |
| ④ Electricity is a | ④ of a chemical. |
| ⑤ Heat is a type of energy | ⑤ a model. |
| ⑥ Light is a type of energy | ⑥ be natural or man made. |
| ⑦ Water is one example | ⑦ everything around us. |
| ⑧ Electrical energy can | ⑧ form of energy. |

1 → _____ 2 → _____ 3 → _____ 4 → _____

5 → _____ 6 → _____ 7 → _____ 8 → _____

Reading Comprehension Activity Page

Have the students cut out the words and glue them under their definitions.



**everything
around us**

**This can cause the
parts of matter to
move faster.**

**This travels fast
in waves.**

**This allows us to
do the things
we do—it has
two types.**

**something made
to show a
real thing**

**energy that can
be natural or
man-made**

**There are
many of these.**

**a liquid, solid,
or gas**



model	matter	state	energy
heat	light	chemical	electrical

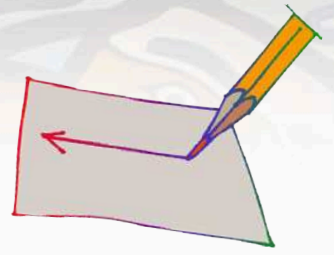


STUDENT SUPPORT MATERIALS

Basic Writing

Basic Writing Activity Page

Have the students write in the missing letters.



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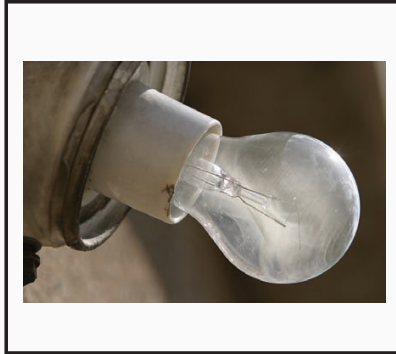
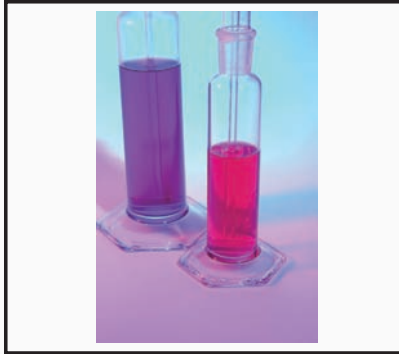
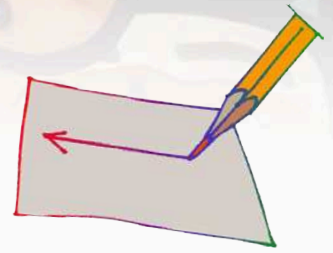
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Basic Writing Activity Page

Have the students write the word for each picture.

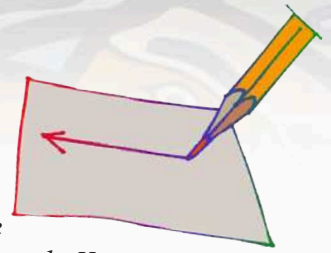




STUDENT SUPPORT MATERIALS

Creative Writing

Creative Writing Activity Page



Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank" for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

MODEL

MATTER

STATE

ENERGY

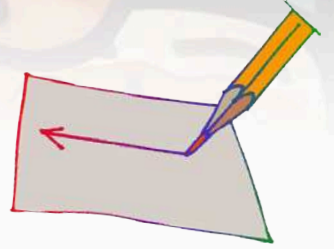
HEAT

LIGHT

CHEMICAL

ELECTRICAL

Creative Writing Activity Page



Have the students write sentences of their own, based on the picture below. When finished, have each student read his/her sentences to the others.





UNIT ASSESSMENT

B-1: Concepts of Physical Science



SCIENCE PROGRAM

Unit Assessment Teacher's Notes
Grade 6 • Unit 3 (B-1)
Theme: Concepts of Physical Science

Date: _____



Unit Assessment

Provide each student with a copy of the students' pages. Read the following instructions aloud. The students should answer the questions on their copies of the assessment.

BASIC LISTENING

Turn to pages 1–2 in your test. Look at the pictures in the boxes.

1. Write the number 1 on top of the picture for **MODEL**.
2. Write the number 2 on top of the picture for **MATTER**.
3. Write the number 3 on top of the picture for **STATE**.
4. Write the number 4 on top of the picture for **ENERGY**.
5. Write the number 5 on top of the picture for **HEAT**.
6. Write the number 6 on top of the picture for **LIGHT**.
7. Write the number 7 on top of the picture for **CHEMICAL**.
8. Write the number 8 on top of the picture for **ELECTRICAL**.

LISTENING COMPREHENSION

Turn to page 3 in your test. Listen to the sentences I say. Circle “T” for true and “F” for false sentences.”

1. A model is bigger than the real thing.
2. Matter is a type of water found in Southeast Alaska.
3. Gas is one state of matter.
4. Energy can change from one form to another.
5. Heat is a form of energy.
6. Chemicals never change.
7. Light travels quickly.
8. Electrical energy makes things work.



Unit Assessment

Provide each student with a copy of the students' pages. Read the following instructions aloud. The students should answer the questions on their copies of the assessment.

SIGHT RECOGNITION

Turn to page 4 in your test. Look at the pictures in the boxes. Circle the word for each picture.

DECODING/ENCODING

Turn to page 5 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.

READING COMPREHENSION

Turn to page 6 in your test. Read the sentence part and fill in the bullet for the correct sentence ending.

BASIC WRITING

Turn to page 7 in your test. Look at the pictures in the boxes. Write the word for each picture.

CREATIVE WRITING

Turn to page 8 in your test. Write a sentence of your own, using each word.

Teacher: To get a percentage for this student's assessment, divide the total number of questions correct by the total number of questions, then multiply this answer by 100 to determine the percentage of questions answered correctly.





SCIENCE PROGRAM

Unit Assessment Student Pages

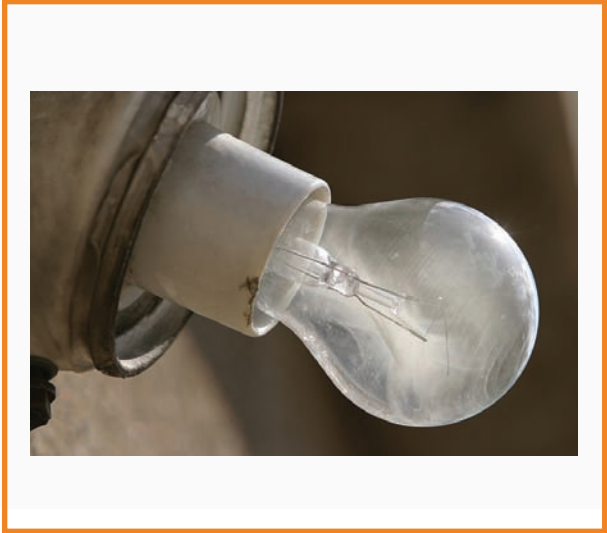
Grade 6 • Unit 3 (B-1)

Theme: Concepts of Physical Science

Date: _____ Student's Name: _____

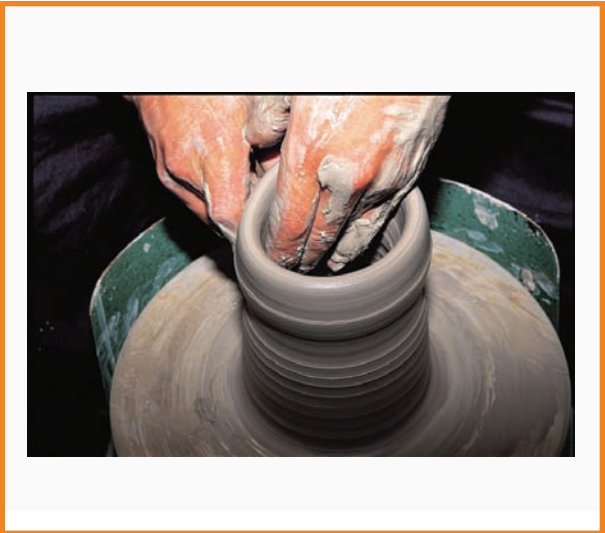
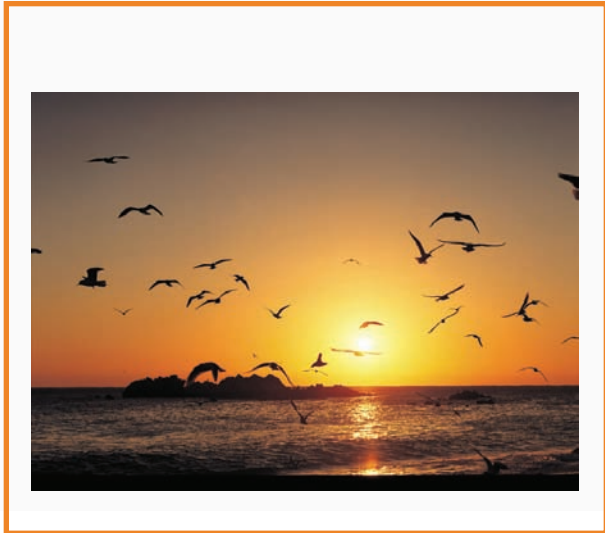
Number Correct: _____ Percent Correct: _____















1. **T** **F**
2. **T** **F**
3. **T** **F**
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7. **T** **F**
8. **T** **F**



model
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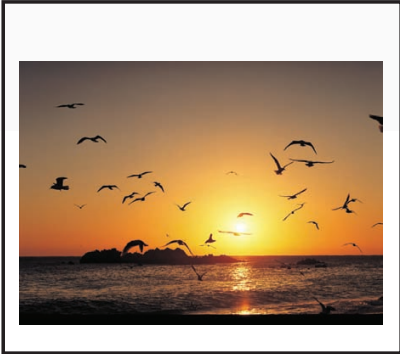
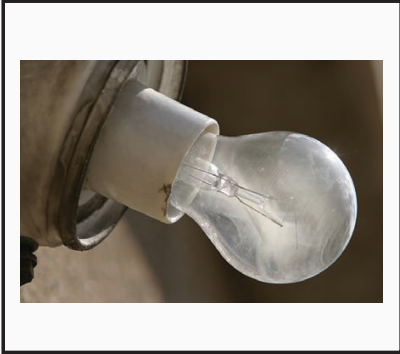
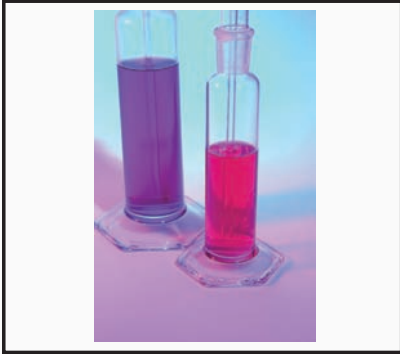
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- 
- 1 Models show
- how to classify objects.
 - how the real things will look.
 - how to make an opinion.
- 2 Matter is
- what things are made of.
 - a way of measuring things.
 - a way to differentiate data.
- 3 The state of matter can
- infer.
 - classify.
 - change.
- 4 Which of these is a form of energy?
- data.
 - heat.
 - fact.
- 5 Heat is a form of energy that can make things go
- from cold to hot.
 - from dry to wet.
 - from hot to cold.
- 6 We can see things because of
- heat.
 - light.
 - data.
- 7 Chemicals can
- hypothesize.
 - change.
 - make an opinion.
- 8 Electrical energy
- measures models.
 - is an opinion.
 - makes things work for us.





MODEL

MATTER

STATE

ENERGY

HEAT

LIGHT

CHEMICAL

ELECTRICAL
