





# UNIT 7

D-1: Concepts of Earth Science





# KEY VOCABULARY

# Culturally Responsive & Place-Based Introduction of Science Vocabulary

## IGNEOUS

### Place-Based Perspective

As the students watch, melt the wax of a candle onto a heat-proof surface to form a ball. Allow the ball to cool. Show the cooled wax to the students and use this as an analogy for the creation of igneous rocks. Lead the students to understand that at one time, all rocks on the earth were igneous. Show a sample of an igneous rock.

## METAMORPHIC

### Place-Based Perspective

Show the students a sample of raw dough and dough that has been baked. Have them tell how the dough was cooked. Lead them to suggest that they were baked with heat. Use this as an analogy for the creation of metamorphic rocks—igneous or sedimentary rocks that are formed from heat, deep in the earth. Show a sample of a metamorphic rock.

## SEDIMENTARY

### Place-Based Perspective

As the students watch, use a grater to grate soap. Drop the grated soap into a glass of water. Use this to introduce the development of sedimentary rocks. As the igneous rocks break down, their dust flows in the rivers and gradually settles, forming sedimentary rocks. Show a sample of a sedimentary rock.

### Heritage Cultural Perspective

*Native people of Southeast Alaska have always been aware of the differences in rock formations and compositions. While labels do not exist in the Native languages for the geological classifications of rocks, hard rocks, such as igneous rocks, were used to heat water and to act as wedges to split wood. Hard rocks were also used to grind bark for tobacco and to crush berries. They were also used to fashion daggers and slings. Flint-like rock and jade were used to make arrowheads and spearheads.*

# Culturally Responsive & Place-Based Introduction of Science Vocabulary

## PROPERTIES

### Place-Based Perspective

Place a lemon, a cookie, a dill pickle, and a potato chip in front of the students. Have the students determine the taste of each of the items. Use this to introduce the properties of items. Have the students cite other properties of items such as weight, size, volume, and feel.

### Heritage Cultural Perspective

*Native people of Southeast Alaska use the process of dehydration to change the properties of meat, fish, seaweed, and berries. Soaking and steaming also are used to alter the properties of wood and roots. Historically, bark was pounded to make tobacco and medicines. Herbs were also dried for preservation.*

## CRUST

### Place-Based Perspective

Show the students an empty pie crust. As they watch, fill the crust with a filling. Use this as an analogy for the earth's crust. The students should understand that the earth's crust is much deeper under the continents than it is under the oceans. It is about 10 miles deep under the oceans and 30 miles deep under the continents.

### Heritage Cultural Perspective

*The Land Otter Man stories tell about the subterranean part of the earth. They tell of a society that thrived underground.*

## MANTLE

### Place-Based Perspective

Place the pie plate (crust) from above on a round, inflated balloon. Use the balloon as a model of the earth's mantle. The students should understand that the mantle goes about 1,800 miles down and is a dense, rocky substance. The mantle makes up 85% of the earth's mass and weight.

### Heritage Cultural Perspective

*The concept of the earth's mantle is not reflected in Southeast Native cultures and languages.*

# Culturally Responsive & Place-Based Introduction of Science Vocabulary

## CORE

### Place-Based Perspective

Show the students an avocado or peach. Cut the fruit in half to reveal the pit. Use the pit as an example of the outer core of the earth, which extends about 3,000 miles down. Carefully open the pit to reveal the seed—use this to introduce the inner core, which extends another 900 miles down. The students should understand that the outer and inner cores are molten rock.

### Heritage Cultural Perspective

*Traditional songs and stories tell of the earth turning and being round. They include mention of the earth's core as being hot and on fire. Volcanoes and hot springs were the physical evidence of underground heat.*

## PLATE

### Place-Based Perspective

As the students watch, place a sheet of construction paper on a tray. Cover it with soil. Then, press the edges of the paper toward the middle, causing the soil to rise (creating a mountain). Use this as a model for the actions of the earth's plates. Relate the plates to earthquakes and tsunamis.

### Heritage Cultural Perspective

*The concept of the earth's plate is not reflected in Southeast Native cultures and languages.*



# 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.*



### Match My Sequence

Provide each student with three vocabulary pictures. All students should have the same pictures. Have the students lay the pictures on their desks in a row (any sequence). When the students have arranged their pictures, say a sequence of three vocabulary words (using the vocabulary words for the pictures the students have). Any student or students whose pictures are in the same sequence as the vocabulary words you said wins the round. The students may change their sequences after each round of the activity.

### Student Support Materials

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

## SPEAKING



### Sheet Golf

Before the activity begins, obtain an old sheet. Cut a hole (approximately two inches in diameter) in each end of the sheet. Group the students into two teams. Have the first player from each team hold opposite ends of the sheet. Place a marble or small ball in the center of the sheet. When you say “Go,” the players must then lift their ends of the sheet and attempt to cause the marble or ball to fall through the hole in the other player’s side of the sheet. When the ball or marble falls through one of the holes, the player on that side of the sheet must say the name of a vocabulary picture you show or he/she should repeat a sentence you said at the beginning of the round. Repeat with other pairs of students until all students have participated. If the sheet is large enough, all students can play—divide the students into four groups (one group for each side). Cut a hole in the sheet near each side. When the marble or ball falls through, all the players on that side must say the name of a vocabulary picture that you show. Repeat.

### Wild Balloon

Before the activity begins, obtain a large balloon. Stand in front of the students and inflate the balloon. Have the vocabulary pictures mounted on the board. Hold the end of the balloon closed. Then, release the balloon. When the balloon lands, the student closest to it should say a complete sentence about a vocabulary picture you point to. Repeat this process until many students have responded.

# 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.*

### 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.

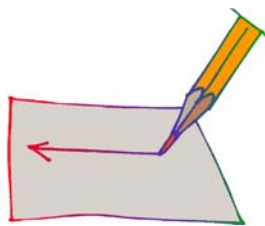
### Letter Encode

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.

### Student Support Materials

Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

## WRITING



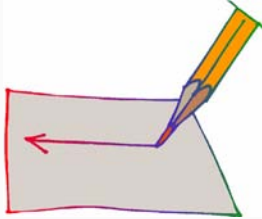
### Flashlight Writing

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.

# Science Language for Success—Lesson 2

## WRITING (CONTINUED)



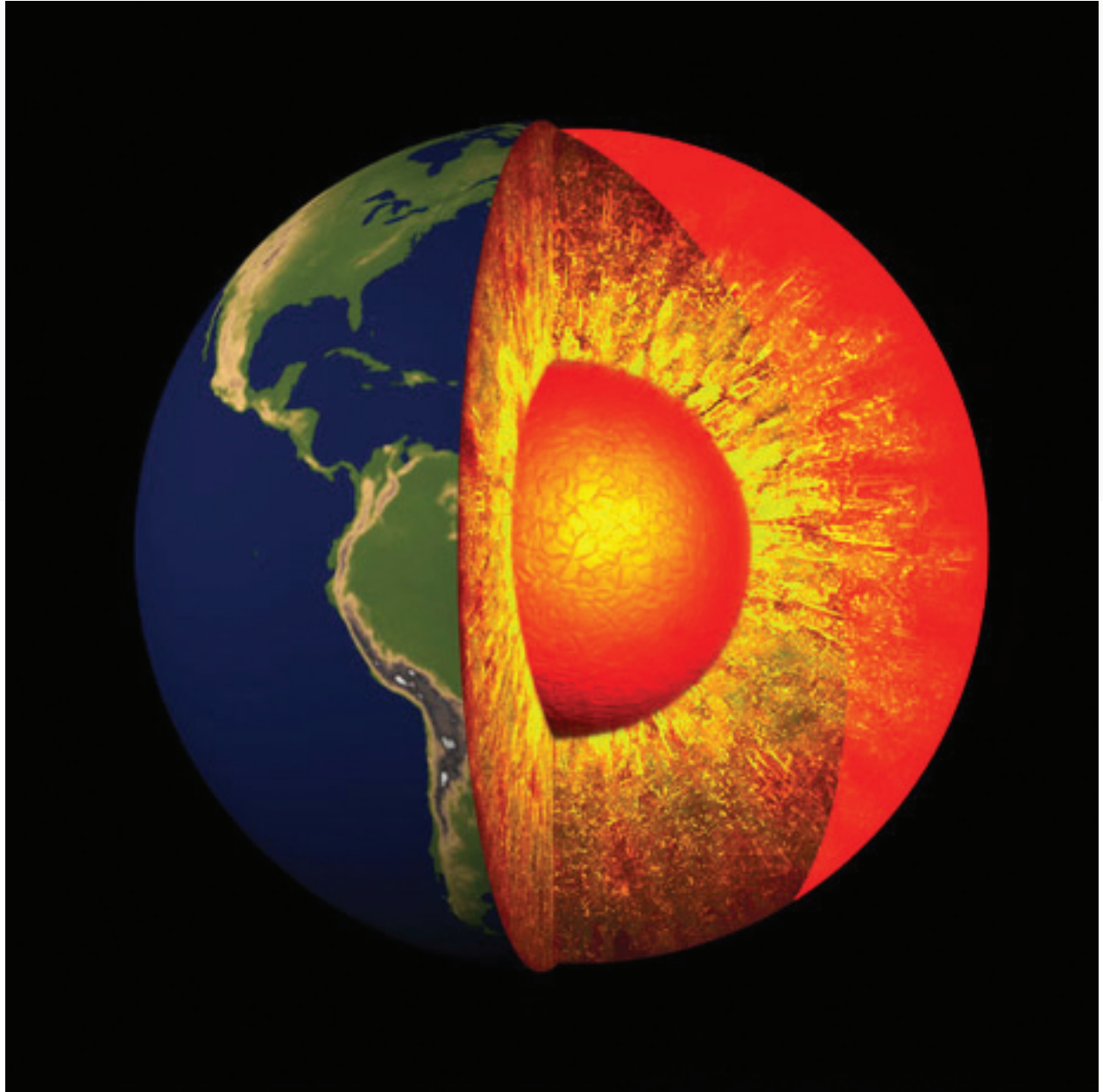
### **Student Support Materials**

Provide the students with a copy of the writing pages from the Student Support Materials. When finished, review the students' work.



# VOCABULARY PICTURES







## CORE





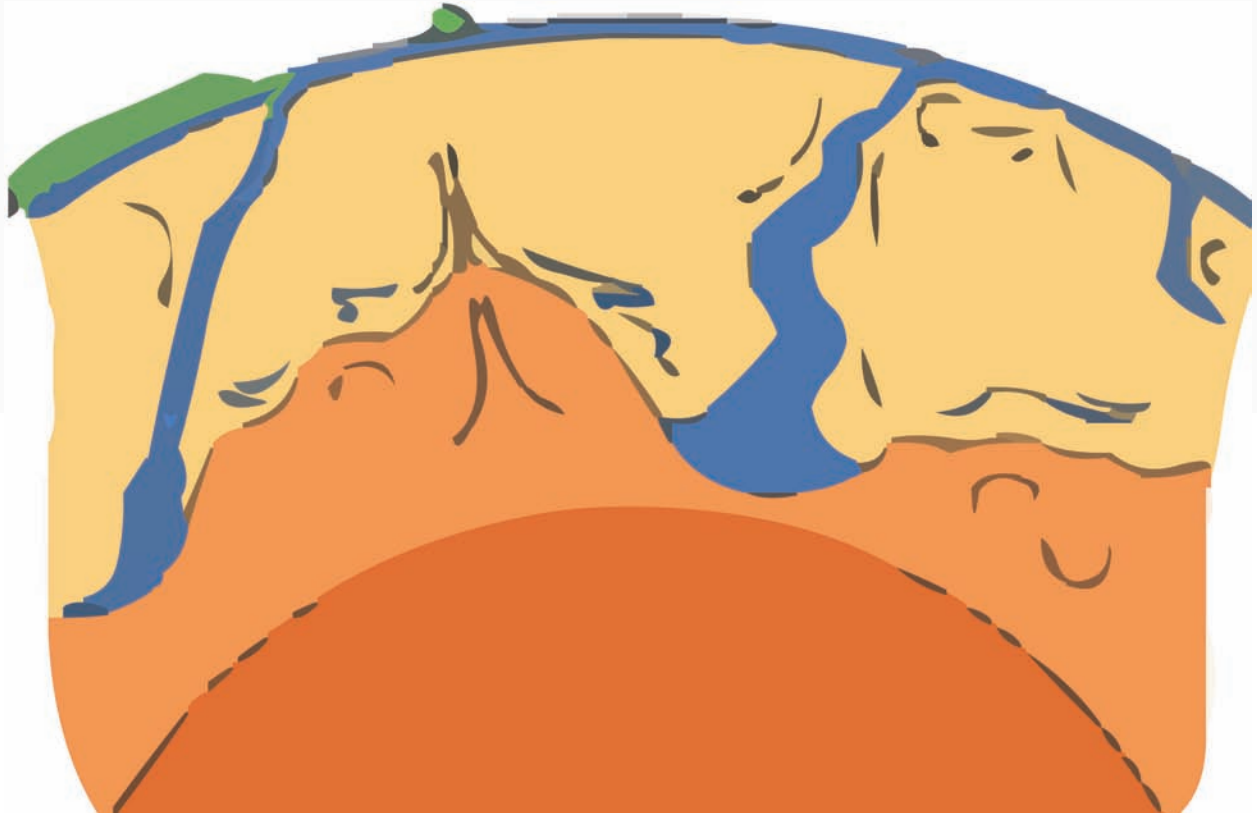


# CRUST





# IGNEOUS





## MANTLE





# METAMORPHIC







## PLATE





## PROPERTIES





## SEDIMENTARY

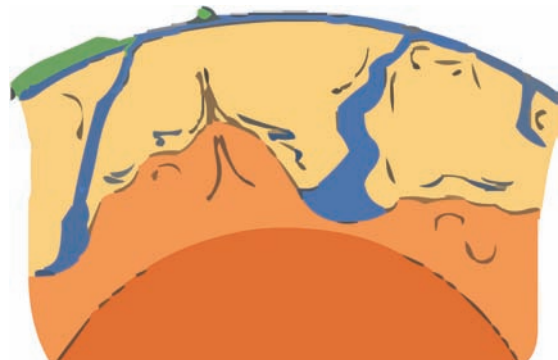
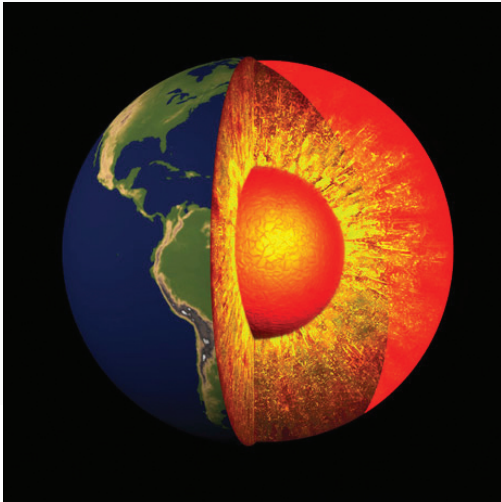
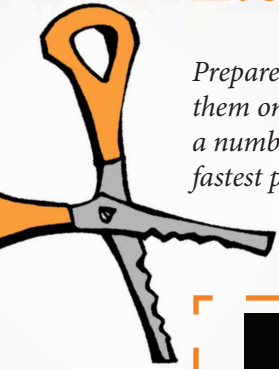


# STUDENT SUPPORT MATERIALS

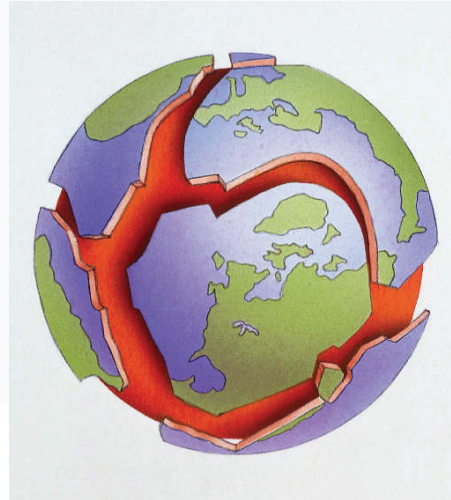
Listening • Mini Pictures

# 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 | Igneous rocks are made through reproduction.                                 | True<br>False |
| ② | Metamorphic rocks are created through heat and pressure.                     | True<br>False |
| ③ | Sedimentary rocks are formed from igneous rocks.                             | True<br>False |
| ④ | All foods have the same properties that can be measured and identified.      | True<br>False |
| ⑤ | The earth’s crust is made of liquid rock and is at the center of the earth.  | True<br>False |
| ⑥ | The earth’s mantle makes up most of the earth’s weight.                      | True<br>False |
| ⑦ | The core of the earth goes about 900 feet down from the earth’s mantle.      | True<br>False |
| ⑧ | The earth’s plates never move, but they can adapt to a changing environment. | True<br>False |



# STUDENT SUPPORT MATERIALS

Sight Words



**sedimentary**

**metamorphic**

**igneous**






**mantle**

**crust**

**properties**



**plate**

**core**



# 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.



plate  
sedimentary  
crust

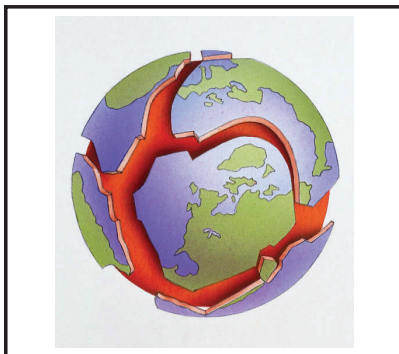
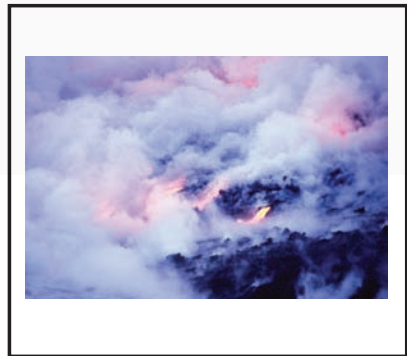
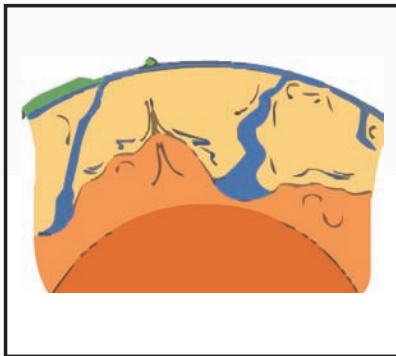
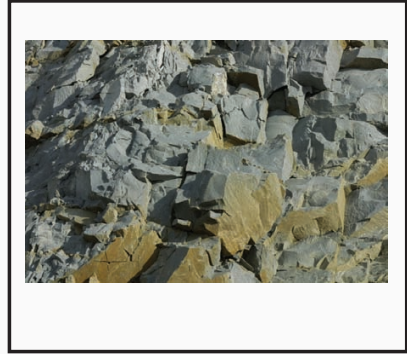
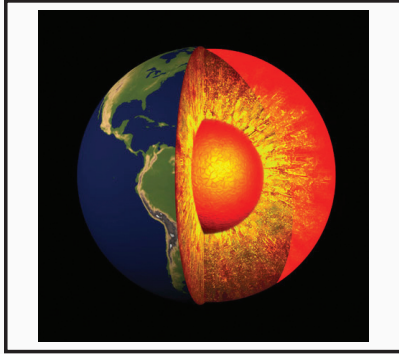
mantle  
igneous  
core

metamorphic  
properties

l i r u c o r e i a a e e a p e e r  
p m p m a n t l t e r c c e o s r r  
p r p r c r u s t t o e t i s e p i  
h p a r m e t a m o r p h i e a m t  
p r p e i c l h p r s c r u l e s g  
r i i e m e t a m o r p h i c t p e  
e i g n e o e e s e d i m e n t a m  
l p i u i t s n r a l m s c o t u i  
t m n m e e g e e m s o m t p r a l  
m c n p r o p e r t i e s i o p a e  
r t n s e e m m a n t l e n r e a m  
t u p e o m r e p g o d o e o y e i  
o s t m d s e d i m e n t a r y c g  
i i t p l r e t r i y r r e m u n l  
o o r s a u i n i t p l a t e p e s  
o h r i l e c h p e r p d e c o m e  
p t n h p t p m i g n e o u s n r a  
e c m m m a l p l e o i u o r r s e  
p r o p e r t e p o m r m m r y e o  
t e u m m s n o m s o a g m r t n e

# Sight Words Activity Page

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



igneous	metamorphic	sedimentary	properties
crust	mantle	core	plate





# 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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# 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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man

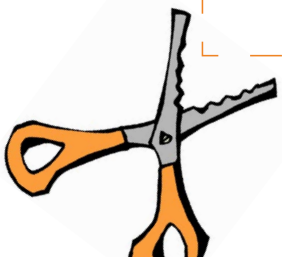
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# STUDENT SUPPORT MATERIALS

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 An igneous rock is formed by
  - water.
  - heat.
  - reproduction.
  - dichotomous key.
  
- ② Metamorphic rocks and sedimentary rocks are formed in the same way
  - sometimes.
  - always.
  - never.
  - only during hibernation.
  
- ③ Sedimentary rocks are formed
  - by settling in water.
  - by gases in the air.
  - by migration to a new environment.
  - by photosynthesis in the winter.
  
- ④ Which of these is a property of the core of the earth?
  - slow migration
  - poor communication
  - sedimentary rocks moving
  - liquid rock
  
- ⑤ The crust of the earth is right on top of the
  - earth's core.
  - earth's mantle.
  - earth's dichotomous key.
  - earth's organisms.

# Reading Comprehension Activity Page



- 6 The earth's mantle makes up about
- 20 percent of the earth's weight and mass.
  - 30 percent of the earth's weight and mass.
  - 60 percent of the earth's weight and mass.
  - 80 percent of the earth's weight and mass.
- 7 The core of the earth is found
- above the crust.
  - halfway through the mantle.
  - between the earth's plates.
  - in the center of the earth.
- 8 Which can be caused by the moving of the earth's plates?
- earthquakes
  - photosynthesis
  - migration
  - communication

# Reading Comprehension Activity Page

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



- |  |                                   |
|--|-----------------------------------|
| ① At one time, all rocks               | ① metamorphic rocks.              |
| ② Heat makes                           | ② with igneous rocks flaking off. |
| ③ Sedimentary rocks begin              | ③ is above the mantle.            |
| ④ A property of an igneous rock is     | ④ were igneous rocks.             |
| ⑤ The crust of the earth               | ⑤ in the center of the earth.     |
| ⑥ The earth's mantle is                | ⑥ that it is hard.                |
| ⑦ The core of the earth is liquid rock | ⑦ under the earth's crust.        |
| ⑧ The earth's plates                   | ⑧ can push against each other.    |

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.



what we can  
use to describe  
something

This makes up  
most of the  
earth's weight.

rocks made from  
heat and pressure

the first layer of  
the earth's layers

the rock from  
which all other  
rocks are formed

rocks made from  
settling in water

These can  
move, making  
mountains.

This is the very  
center of  
the earth.



igneous	metamorphic	sedimentary	properties
crust	mantle	core	plate



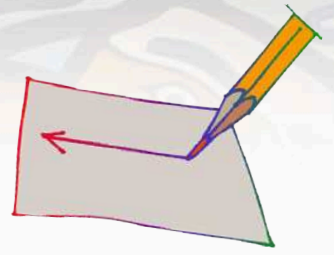


# STUDENT SUPPORT MATERIALS

Basic Writing

# Basic Writing Activity Page

Have the students write in the missing letters.



ig \_\_\_\_\_ s

met \_\_\_\_\_ c

sed \_\_\_\_\_ y

pr \_\_\_\_\_ s

cr \_\_\_\_\_ t

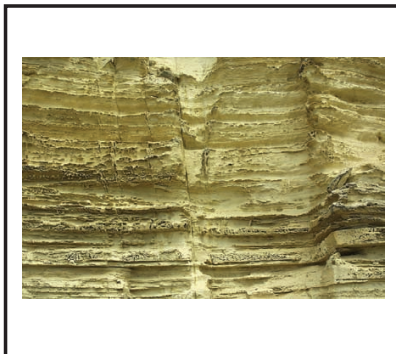
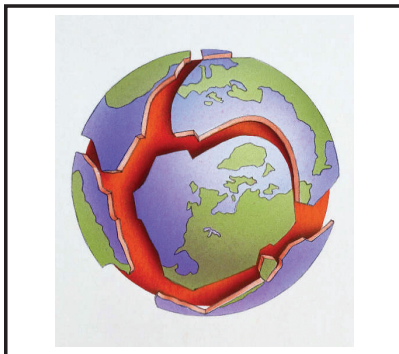
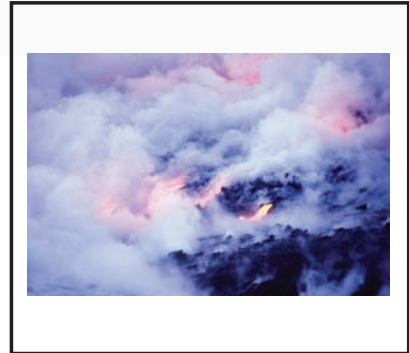
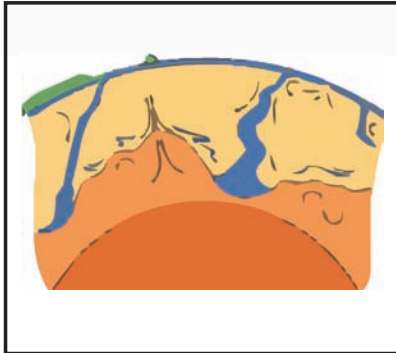
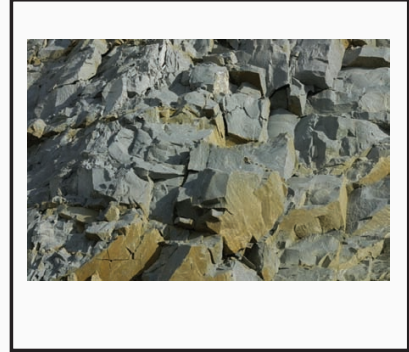
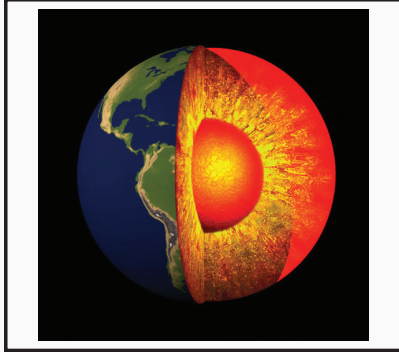
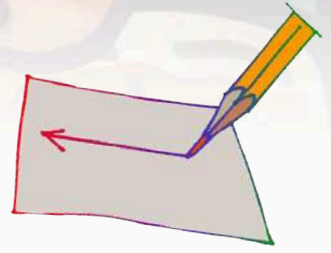
m \_\_\_\_\_ e

c \_\_\_\_\_ e

pl \_\_\_\_\_ e

# Basic Writing Activity Page

Have the students write the word for each picture.





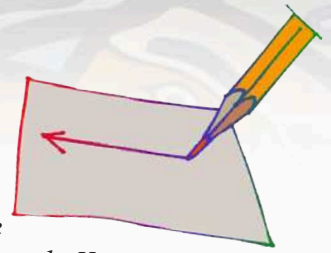




# STUDENT SUPPORT MATERIALS

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.

## IGNEOUS

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## METAMORPHIC

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## SEDIMENTARY

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## PROPERTIES

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## CRUST

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## MANTLE

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## CORE

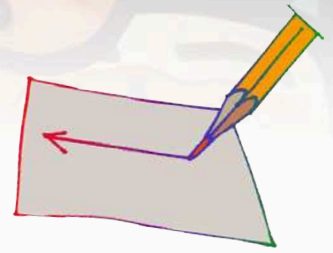
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## PLATE

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# 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.



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# UNIT ASSESSMENT

## D-1: Concepts of Earth Science





# SCIENCE PROGRAM

Unit Assessment Teacher's Notes  
Grade 6 • Unit 7 (D-1)  
Theme: Concepts of Earth 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 **IGNEOUS**.
2. Write the number 2 on top of the picture for **METAMORPHIC**.
3. Write the number 3 on top of the picture for **SEDIMENTARY**.
4. Write the number 4 on top of the picture for **PROPERTIES**.
5. Write the number 5 on top of the picture for **CRUST**.
6. Write the number 6 on top of the picture for **MANTLE**.
7. Write the number 7 on top of the picture for **CORE**.
8. Write the number 8 on top of the picture for **PLATES**.

## 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. Igneous rocks are formed by light energy.
2. Metamorphic rocks are formed from heat and pressure.
3. Sedimentary rocks are formed from gas in the environment.
4. Igneous and sedimentary rocks have the same properties.
5. The earth's crust is at the center of the earth.
6. The earth's mantle is between the earth's crust and core.
7. The core of the earth is liquid.
8. The earth's plates can move.



# 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 7 (D-1)  
Theme: Concepts of Earth Science

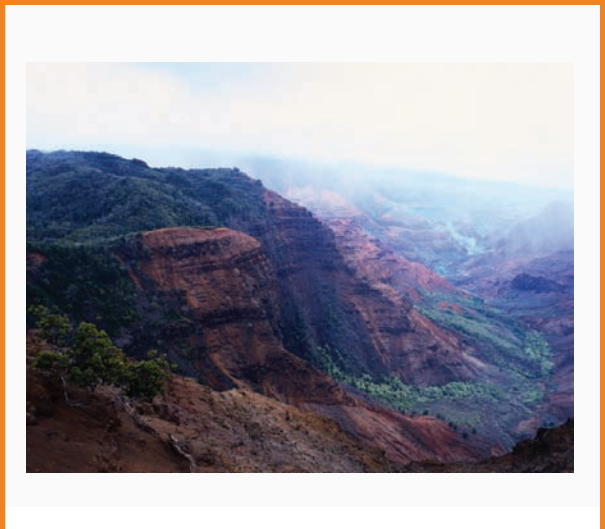
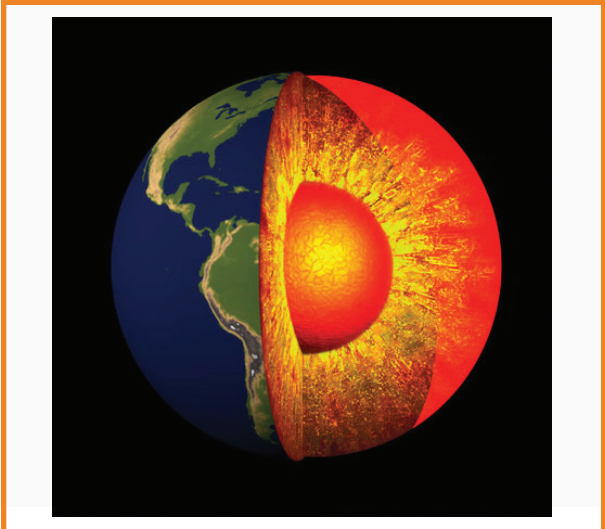
Date: \_\_\_\_\_ Student's Name: \_\_\_\_\_

Number Correct: \_\_\_\_\_ Percent Correct: \_\_\_\_\_



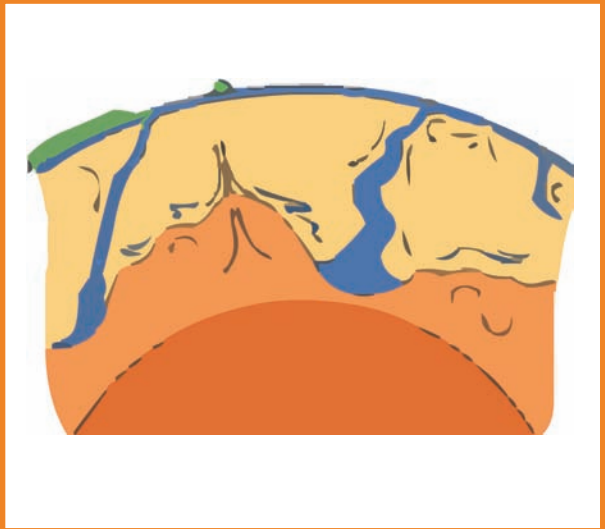
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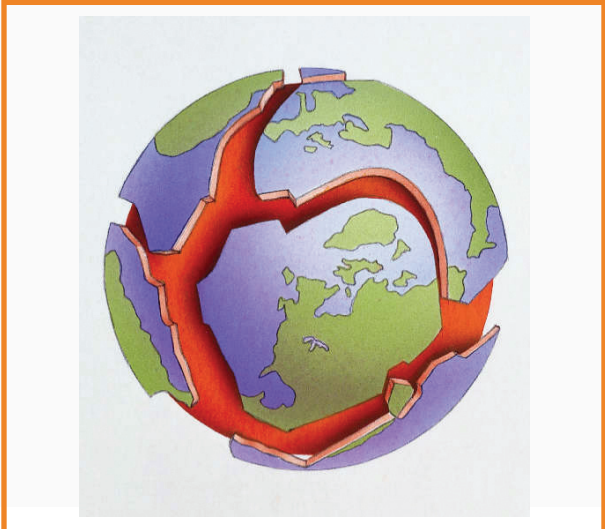
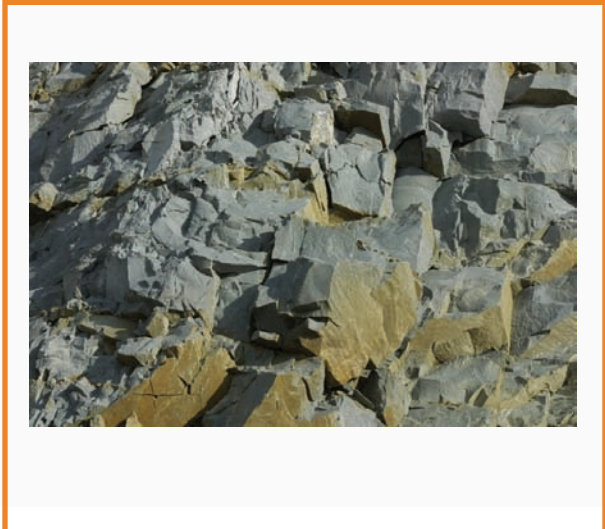
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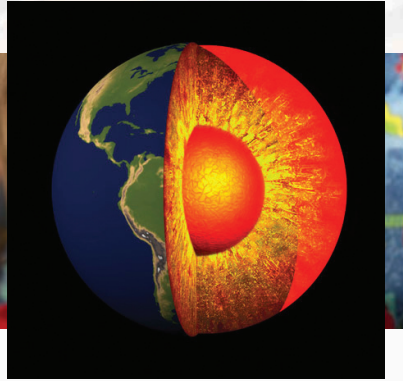
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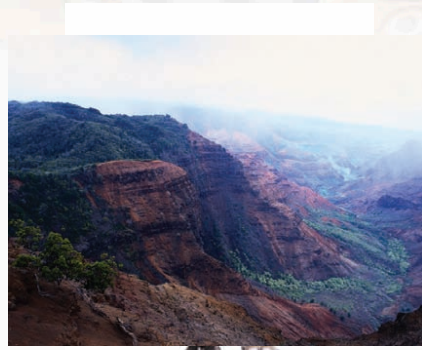




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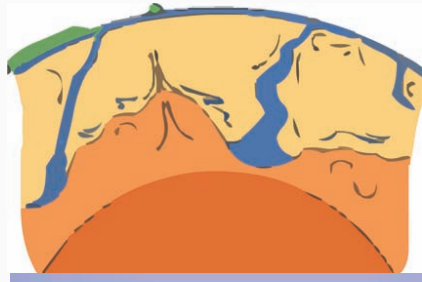
igneous  
metamorphic  
sedimentary  
properties  
crust  
mantle  
core  
plates



igneous  
metamorphic  
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properties  
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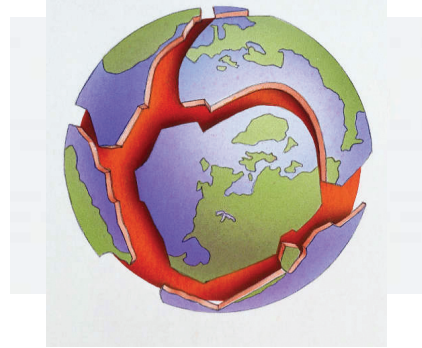
igneous  
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1 Igneous rocks are made from  
 a liquid state that gets solid.  
 water.  
 internal gases.

2 Heat is one thing that makes  
 sedimentary rocks.  
 external gases.  
 metamorphic rocks.

3 Sedimentary rocks have  
 gases.  
 layers.  
 respiration.

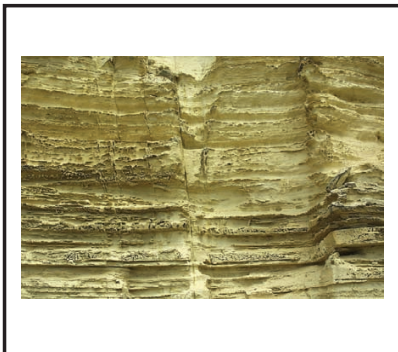
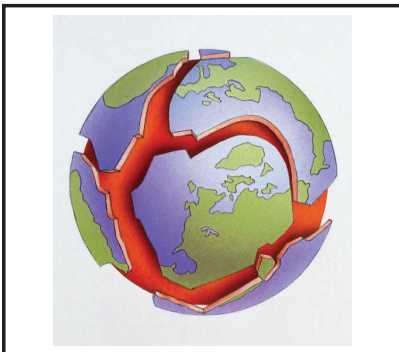
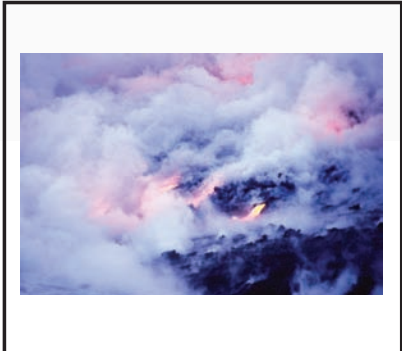
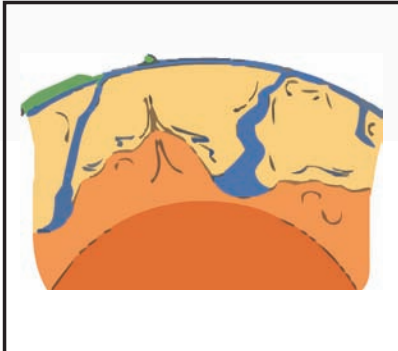
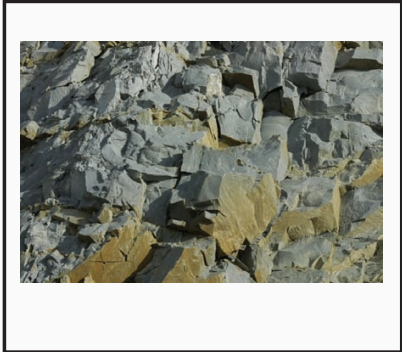
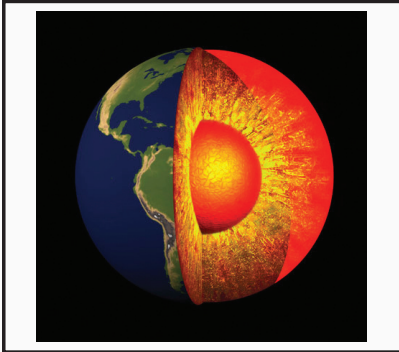
4 One property of a solid is that it  
 has gas.  
 has light.  
 has shape.

5 The crust of the earth is  
 at the core.  
 above the mantle.  
 below the mantle.

6 The earth's mantle is  
 under the crust.  
 in the core.  
 above the crust.

7 The core of the earth is  
 at the earth's center.  
 just under the earth's crust.  
 just above the earth's mantle.

8 The earth's plates can  
 light up.  
 predict.  
 move.





**IGNEOUS**

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**METAMORPHIC**

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**SEDIMENTARY**

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**PROPERTIES**

---

**CRUST**

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**MANTLE**

---

**CORE**

---

**PLATES**

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