UNIT 2

A–1: Science as Inquiry Process

KEY VOCABULARY

Culturally Responsive & Place-Based Introduction of Science Vocabulary

DIFFERENTIATE

Place-Based Perspective

Show the students three types of salsa—mild, medium, and hot. You may wish to show other food items that can be categorized. Direct the students' attention to the logos that indicate levels of heat. Use this as a means to differentiate the salsas. Cite other food items that can be differentiated, such as breads, meats, etc.

Heritage Cultural Perspective

Traditionally, Native peoples of Southeast Alaska could differentiate where people came from by their crests, dialects, clothing, trade items, art, and customs.

FACT

Place-Based Perspective

Show the students a variety of items such as a chocolate bar, a plastic bag, a match, etc. Have the students identify facts associated with each of the items. Have the students provide facts based on other items or situations.

Heritage Cultural Perspective

Since Native peoples lived in tune with their environment, they established many facts related to natural phenomena. For example, after a dry summer, they knew there would be fewer salmon to harvest. Consequently, there would be fewer salmon returning to the spawning grounds. This in turn would cause the bears to seek food in other locations, such as berry patches and smoke houses.

OPINION

Place-Based Perspective

Show the students a DVD case that has opinions related to the quality of the film. Use this to introduce the concept of expressing an opinion. Have the students suggest other movies that were, in their opinions, excellent (hopefully, not all students will agree and opinions will vary).

Heritage Cultural Perspective

In cases where opposite clan members or members within a clan have severe differences of opinion, a mediator is brought out at a public gathering. He/She acts as the peace maker between the two parties.

Culturally Responsive & Place-Based Introduction of Science Vocabulary

DATA

Place-Based Perspective

Give each student two beans from a can of cut green beans. Have the students count the number of seeds in their beans. Record the data on the board; determine which students have the least number of seeds, the most number, and the same. Cite other examples of data that can be collected (e.g., days missed from school, how often one eats fish, etc.).

Heritage Cultural Perspective

Survival in Southeast Alaska involved the recording of data relating to natural resources. For example, people would collect data related to a season's fishing, hunting, and harvesting statistics. This would tell if there were enough resources to survive the winter.

ENVIRONMENT

Place-Based Perspective

Place a tray of soil in front of the students. Divide the soil into two areas. In one area, add water to create a wet environment; leave the other side dry to represent an arid environment. Have the students compare and contrast the two environments in terms of plants, animals, uses, and so on.

Heritage Cultural Perspective

Native peoples have always lived in harmony with their environments. Respect for all aspects of the environment, both animate and inanimate, allowed for a balanced way of life.

MEASURE

Place-Based Perspective

Show the students a slice of bread. Have the students suggest the steps necessary to make bread—lead them to suggest that many people measure their ingredients. Have the students name other things that are measured for size, length, duration, and area. Relate measurements to sports contexts such as basketball courts, baseball, and football fields, etc.

Heritage Cultural Perspective

Traditionally, Native people had to know how to measure to build clan houses, form dug-out canoes, and create regalia.

Culturally Responsive & Place-Based Introduction of Science Vocabulary

HYPOTHESIZE

Place-Based Perspective

Show the students a box of cake mix. Read the ingredients and directions to the students. Then, have them imagine what would happen if, for example, you replaced the liquid with juice, used twice as many eggs, added food color, and so on. Lead the students to hypothesize the outcomes.

Heritage Cultural Perspective

Traditionally, Tlingit, Haida, and Tsimshian peoples would have hypothesized about various aspects of the environment. This might have included hypotheses such as, "a landslide caused the large rock to move" and "lightening broke the large tree" and so on.

IDENTIFY

Place-Based Perspective

Before the lesson begins, prepare an audio tape that contains the sound effects of common things such as running water, frying food, walking, etc. Play the tape, calling upon the students to identify each sound. Locate a large picture, and mount it on the board. Have the students identify details in the picture. Have the students suggest how things can be identified.

Heritage Cultural Perspective

During traditional Native introductions, people identify who they are by their names, their clans, their houses, and their relations in the opposite moiety.

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.

Locomotive

Have the students stand in a straight line in the center of the room. Each student should place his hands on the shoulders of the student in front of him/her. Mount a picture on each of the four walls in the classroom. Tell the students that when they hear one of the four vocabulary words (for the four pictures on the walls), they should step in that direction while still holding onto the shoulders of the players in front of them. Say the four words a number of times; the students should step toward the pictures as they are named.

Funnel Vision

Before the activity begins, collect a large funnel. Have a student stand at the front of the classroom with his/her back to the other students. Give the student the funnel. Give the vocabulary pictures to the other students in the class. The students should hold their pictures up, facing the front of the classroom. Say a vocabulary word. When you say "Go," the student with the funnel should place the funnel over his/her eyes and turn to face the other students. The student must then look through the funnel to find the picture for the vocabulary word you said. This activity may be conducted with two players (each player having a funnel). The winner of each round is the student who locates the correct picture first. Have the students in the class exchange pictures for each new round of the activity. Repeat.

Student Support Materials

Have the students work on the activity pages from the Student Support Materials from this unit.

SPEAKING

Flip of the Coin

Provide each student with a penny. Keep one penny for yourself. Mount the vocabulary pictures on the board. Have the students (gently) toss their pennies into the air. Each student should look to see which side of his/her penny is face-up. Toss your penny into the air in the same way. Call the side of your penny that is face-up. The students who have the same side of coin face up must then identify (orally) a vocabulary picture you point to. For example, if the heads side of your coin is face up, the students who have heads showing on their coins must then orally identify the vocabulary picture you point to. Repeat this process a number of times.

Science Language for Success—Lesson 2

SPEAKING (CONTINUED)

High Roller

Give a die to each of two students. When you say "Go," the students should roll their dice. The student who rolls the highest number on his/her die must then say a complete sentence about a vocabulary picture that you show. Repeat this process until many students have responded with sentences of their own.

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.

Word Length

Before the activity begins, cut a number of sight word cards into different lengths (e.g., 5 in., 15 cm., etc.). Place the sight word cards on the floor at one end of the classroom. Group the students into two teams at the other end of the classroom. Place two rulers on the floor beside the sight words. Say a different measurement to the first player in each team. When you say "Go," the first player in each team must rush to the sight word cards. Each player must then use the ruler to locate a sight word card that is the same length as the measurement you said. When a player has done this successfully, he/she should read the sight word on that card. Repeat until all players in each team have participated.

What's Your Sequence?

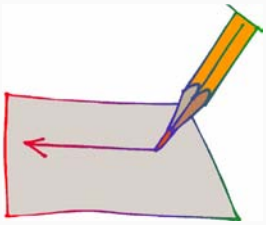
Provide each student with four blank flashcards. Write four sight words on the board. Each student should write the same sight words on each of his cards (one word per card). When the students' cards are ready, have them arrange their sight word cards in a specific sequence on their desks (each student should determine his/her own sequence of words). Then, say a sequence of the four words. Any student or students who have their sight words in the same sequence as you said win the round. The winner or winners of this activity are those students who collect the greatest number of wins. The students may change the sequence of their sight word cards after each round of the activity.

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 for the picture. Review the students' work. Repeat, until all of the words have been spelled in this way.

Science Language for Success—Lesson 2

WRITING



Back Writing

Group the students into two teams. Have the first player from each team stand in front of the board. Use the index finger of your writing hand to "write" the first letter of a sight word on the two players' backs. When you have done this, say "Go." Each of the players should then write a sight word on the board that begins with that letter. Repeat with other pairs of players until all players in each team have played and until all sight words have been written a number of times.

Word Completion

Before the activity begins, prepare clozure cards for the sight words; omit letters and syllables. Provide each student with a clozure card. Call upon the students to complete their words on the clozure cards by writing in the missing parts. Afterward, review the students' responses.

Student Support Materials

Have the students work on the activity pages from the Student Support Materials for this unit.

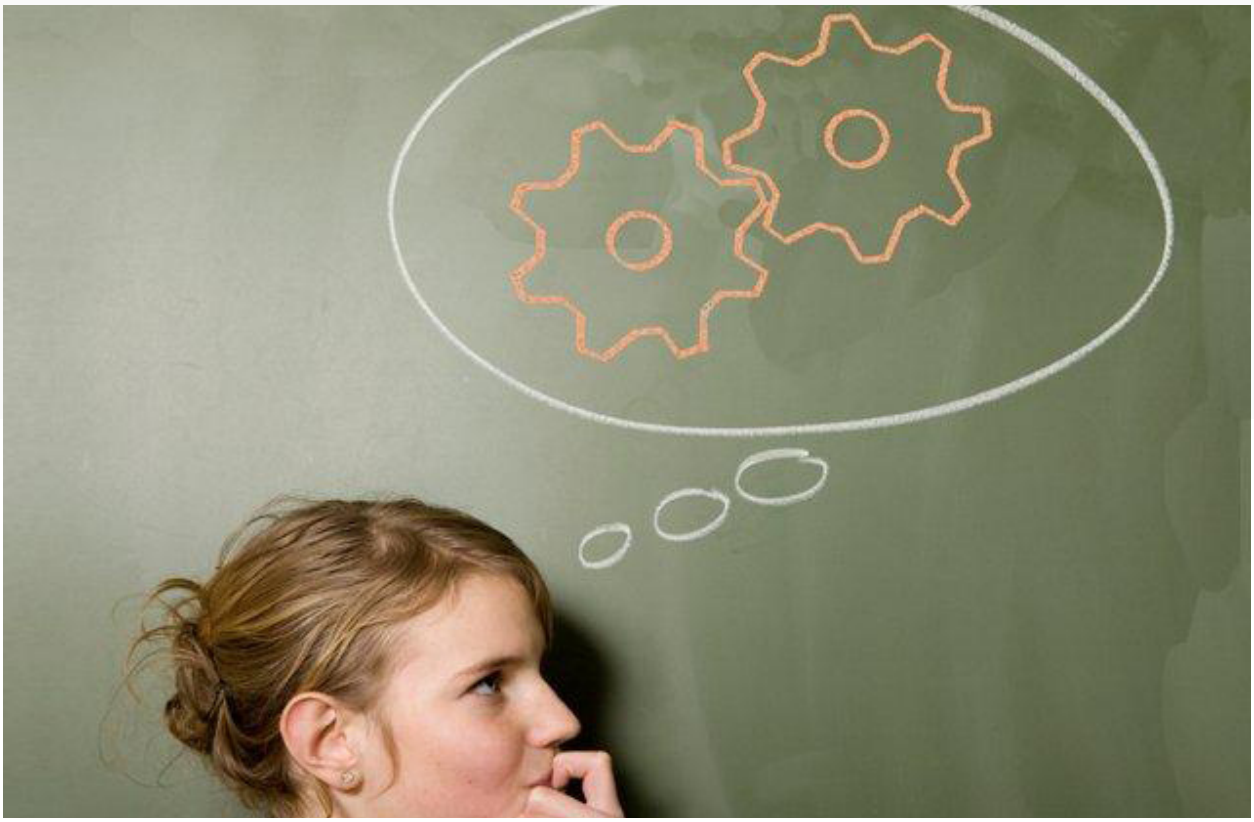
VOCABULARY PICTURES

DATA

DIFFERENTIATE

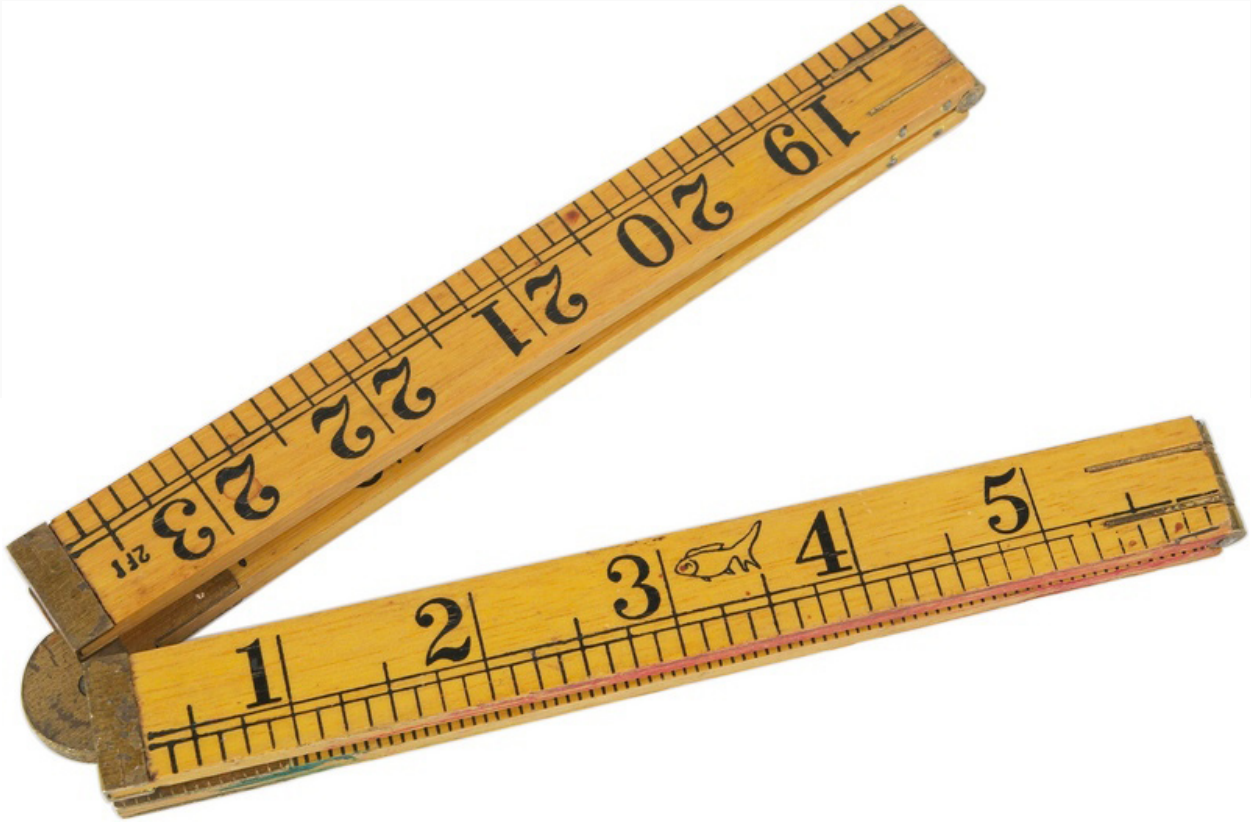
ENVIRONMENT

FACT



HYPOTHESIZE

IDENTIFY


19 20 21 22 23
1 2 3 4 5

MEASURING

OPINION

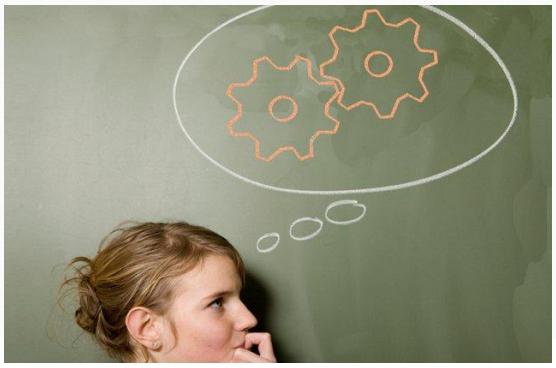
STUDENT SUPPORT MATERIALS

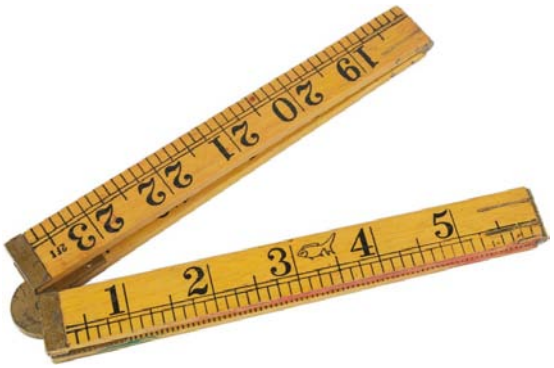
Listening • Mini Pictures

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. We can differentiate tastes among different types of doughnuts. **True** **False**

2. A fact is something we make up based on information someone gives us. **True** **False**

3. A person can develop an opinion based on information that he/she has. **True** **False**

4. Data are always collected at the same time of day to be sure they are accurate. **True** **False**

5. It is difficult to build a house with a basement in a wet environment. **True** **False**

6. Measuring is an important part of buying a new pair of shoes. **True** **False**

7. We can hypothesize about something only after we soak it for twenty-four hours. **True** **False**

8. We can identify different types of fruit by the sounds they make. **True** **False**

STUDENT SUPPORT MATERIALS

Sight Words

measure

hypothesize

identify


opinion
data
environment

differentiate

fact

STUDENT SUPPORT MATERIALS

Basic Reading • Sight Recognition

Sight Words Activity Page

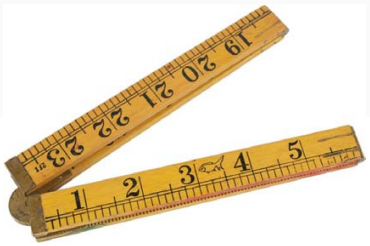
Have the students highlight or circle the words in this word find. Words appear horizontally.

data
differentiate
fact
environment
hypothesize
opinion
measure

u t m i n f i r c z s p i n e a f f
r d i f f e r e n t i a t e t n i n
a f i r n e f i o h n t n s a o d e
p f a n o r r m a u n n p s n e m n
s i m e a s u o h y p o t h e s i t
z v a e t f t t p n a o m e n r a o
e a o e y n o i a a e t p i t e i t
e f n p n u n e o n n f r d a e t e
i a t a p p y o a m e a s u r e o f
y i i o n o t o p i e a o a c p t e
t o p i n h z u e e n f a c t e o n
t s r f z o e n v i r o n m e n t t
e e y e n v i r o n m e n v n e z r
t d e s n o a d a t a r n e d e e d
i d i o f e d i f f e r e n t i a i
h y p o t h e s i z e o p i n i o n
p d z h a i o p o d n y t c u e d p
t o o t i t e n v i a y z a v t p t
i a e f t i i c r i e e d e h f f a
p s e i i e i n t n o o y d a m a s

Sight Words Activity Page

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



identify hypothesize measure environment

fact opinion data differentiate

Sight Words Activity Page

Have the students print the key words from this unit horizonally in the boxes (each word may be written more than once). They should then fill in all other boxes with any letters. Have the students exchange pages. The students should then circle the words on the page.

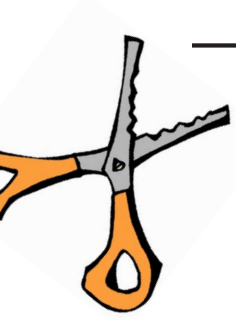
STUDENT SUPPORT MATERIALS

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.

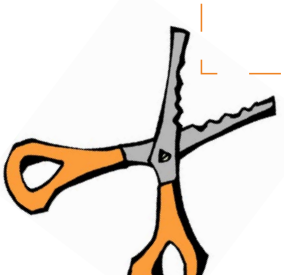
ate	dif	en	ti	fer
vi	ment	ron	ti	
the	hy	size	po	
den	i	fy	ti	



Encoding Activity Page

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

identi	sure
hypoth	ta
mea	ion
environ	fy
da	ct
opin	tiate
fa	esize
differen	ment



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 We can only differentiate things based on how they look.

- ❍ yes
- ❍ no
- ❍ always
- ❍ never

2 The following is a fact:

- ❍ We can differentiate the tastes between mild and spicy foods.
- ❍ How much we eat determines the color of our hair.
- ❍ Fries are made from large fruit that grow in wet environments.
- ❍ Data are only served after weddings, before the dance.

3 An opinion about who will win the basketball game can be

- ❍ based on data collected ten years before.
- ❍ based on the colors of the players' shirts.
- ❍ based on information we learn about the players.
- ❍ based on no information.

4 Data can

- ❍ help people to sleep better at night.
- ❍ give information about something.
- ❍ be based on no information.
- ❍ be eaten if measured carefully.

5 An example of an environment would be

- ❍ the type of food eaten in Southeast Alaska.
- ❍ Southeast Alaska.
- ❍ kitchen furniture.
- ❍ rooms of a house.

Reading Comprehension Activity Page

6 We measure things

- ❍ to make jokes.
- ❍ in different ways.
- ❍ only when we are asleep.
- ❍ using a hammer and nail.

7 We can hypothesize

- ❍ based on facts we have.
- ❍ based on no facts.
- ❍ based on no information.
- ❍ based on information we don't have.

8 We can identify something

- ❍ we have never seen.
- ❍ based on data we get.
- ❍ based on no data.
- ❍ without information.

Reading Comprehension Activity Page

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

1	I identified the information	A	of an environment.
2	He hypothesized that too much	B	collected over time.
3	He used a ruler	C	after reading the data.
4	The desert is an example	D	based on information he/she has.
5	Data can be	E	differentiate two experiments.
6	A person develops an opinion	F	sugar can affect our vision.
7	A fact is something that	G	to measure the length of an object.
8	We can use data to	H	has been proven.

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.

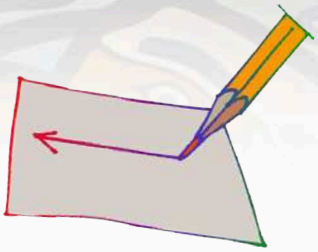
something that has been proven	a person's belief	where things live
information	to tell how things are the same or different	a way of getting some information about something
to make a statement that we hope to prove	recognize something	

differentiate	fact	opinion	data
environment	measure	hypothesize	identify

STUDENT SUPPORT MATERIALS

Basic Writing

Basic Writing Activity Page



Have the students write in the missing letters.

iden_____y

hy_____ze

mea_____e

env_____t

d_____a

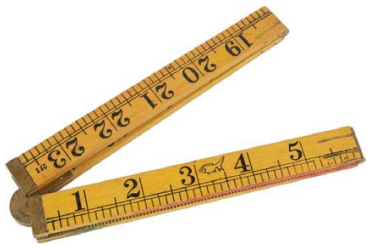
op_____n

f_____t

differ_____e

Basic Writing Activity Page

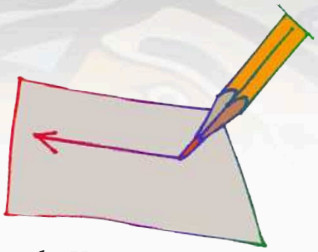
Have the students write the word for each picture.



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.

DIFFERENTIATE

_____

FACT

_____

OPINION

_____

DATA

_____

ENVIRONMENT

_____

MEASURE

_____

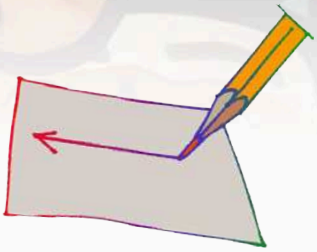
HYPOTHESIZE

_____

IDENTIFY

_____

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

A–1: Science as Inquiry Process

SCIENCE PROGRAM

Unit Assessment Teacher's Notes
Grade 6 • Unit 2 (A–1)
Theme: Science as Inquiry Process

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 **DIFFERENTIATE**.
2. Write the number 2 on top of the picture for **FACT**.
3. Write the number 3 on top of the picture for **OPINION**.
4. Write the number 4 on top of the picture for **DATA**.
5. Write the number 5 on top of the picture for **ENVIRONMENT**.
6. Write the number 6 on top of the picture for **MEASURING**.
7. Write the number 7 on top of the picture for **HYPOTHESIZE**.
8. Write the number 8 on top of the picture for **IDENTIFYING**.

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. When we differentiate we look for how things are the same.
2. A fact is something that is true.
3. People can have different opinions about something.
4. Data is what we can get from observing something.
5. An environment is where things live.
6. We measure when we sing a new song.
7. We can hypothesize about something to prove it.
8. We can identify something that is described to us.

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.

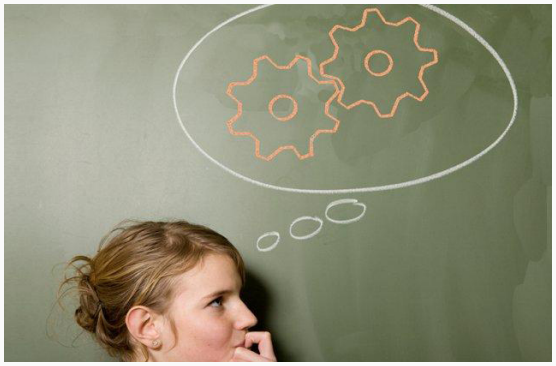
Teacher: To get a percentage for this student's assessment, divide the total number of questions correct by the total number of questions, then multiply this answer by 100 to determine the percentage of questions answered correctly.

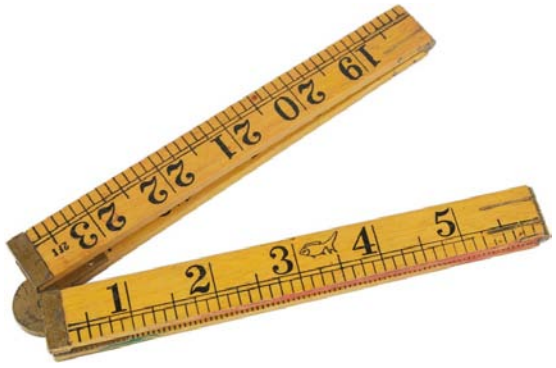
SCIENCE PROGRAM

Unit Assessment Student Pages
Grade 6 • Unit 2 (A–1)
Theme: Science as Inquiry Process

Date:_____ Student's Name:_____

Number Correct:_____ Percent Correct:_____





1. T F

2. T F

3. T F

4. T F

5. T F

6. T F

7. T F

8. T F

differentiate
fact
opinion
data
environment
measuring
hypothesize
identifying

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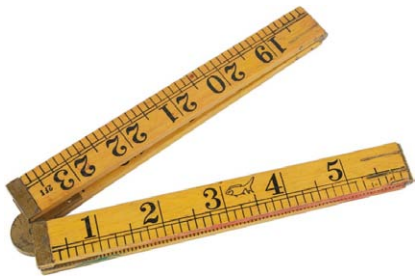

differentiate
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identifying

differentiate
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measuring
hypothesize
identifying

differen	iate tiate tite taite shiate tiute iaaat eait tiuite
fa	kt tk cd dk ct te cb k gt
opin	on union uon aon unn ion uan iun ien
da	t ta tu te tye taa la ma sa
en	vurinment ironment onment ment varinment vironment vaeronment ent nment
mea	shure sur sering seering saring iring suring saring ring
hypoth	size esze usize isize ize asize iize esize eze
iden	tufy taffying tuffing tiffiying tifying tfing tifyeing tifius tiffiey

1. When we differentiate we
   - ❍ predict outcomes.
   - ❍ notice differences.
   - ❍ give up.

2. A fact is
   - ❍ something we infer.
   - ❍ something we classify.
   - ❍ something true.

3. An opinion is
   - ❍ something a person observes.
   - ❍ something a person believes.
   - ❍ something that is a fact.

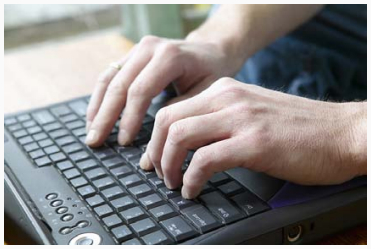
4. Data can be
   - ❍ information.
   - ❍ a food.
   - ❍ a form of water.

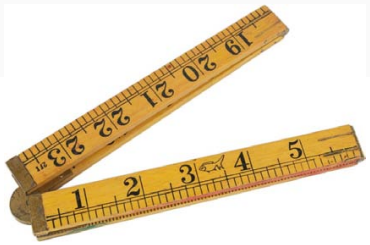
5. All people live in the same environment.
   - ❍ true.
   - ❍ false.

6. Measuring is something we do when we
   - ❍ need to know how something tastes.
   - ❍ need to know the size of something.
   - ❍ communicate by phone.

7. We hypothesize to
   - ❍ get information.
   - ❍ travel far.
   - ❍ make a big meal.

8. We can identify something by
   - ❍ sleeping.
   - ❍ running.
   - ❍ observing.




19 20 21 22 23
1 2 3 4 5

DIFFERENTIATE

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FACT

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OPINION

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DATA

_____

ENVIRONMENT

_____

MEASURING

_____

HYPOTHESIZE

_____

IDENTIFYING

_____