UNIT 13:
Statistics & Probability
Probability

Note: All key terms are based on the Math Standards for Alaska and reflect terms vital to academic achievement in math.

INTRODUCTION OF MATH VOCABULARY

Process Skills

Concrete Introduction of Key Vocabulary
Note: *A vocabulary graphic is provided in this unit for each of the key words. Definitions for all of the key words can be found in the glossary at the back of this program.*

probability

Draw a plant on the board and explain to the students that it only flowers every other year. You do not know when the last time it flowered is. What is the probability that it will flower this year? Explain to the students that it has a 50/50 chance of flowering!

experimental probability

Have the students tell you the probability that a coin will land on heads. Toss a coin ten times and record its disposition on the board. Explain that you conducted an experiment to determine the probability. Was this the same result as the students theorized?

theoretical probability

Ask the students how many of them have a twin and/or know of twins. Explain that the theoretical probability of having a twin is about 1 in 40. This may be more or less within a family or cultural group!

Process Skills

Concrete Introduction of Key Vocabulary
Note: *A vocabulary graphic is provided in this unit for each of the key words. Definitions for all of the key words can be found in the glossary at the back of this program.*

systematic

Have the students explain the process of making a peanut butter and jelly sandwich to you and write each step on the board. Explain that though some people may have variations in how they make these, it is a rather systematic process! Now try to make all the foods for Thanksgiving at the same time!

simulation

Ask the students how many of them have played a video or computer game where a car had to be driven or a plane flown. Explain that this is a simulation of the real thing. Pilots and astronauts often train on simulators to keep them safe while they are learning!

prediction

Ask the students to make a prediction on how many people will sneeze in the next hour. Keep track and give an award to those who guessed correctly! Explain that many predictions are based on some knowledge of an event and rather than being a random guess, they are educated guesses.

Process Skills

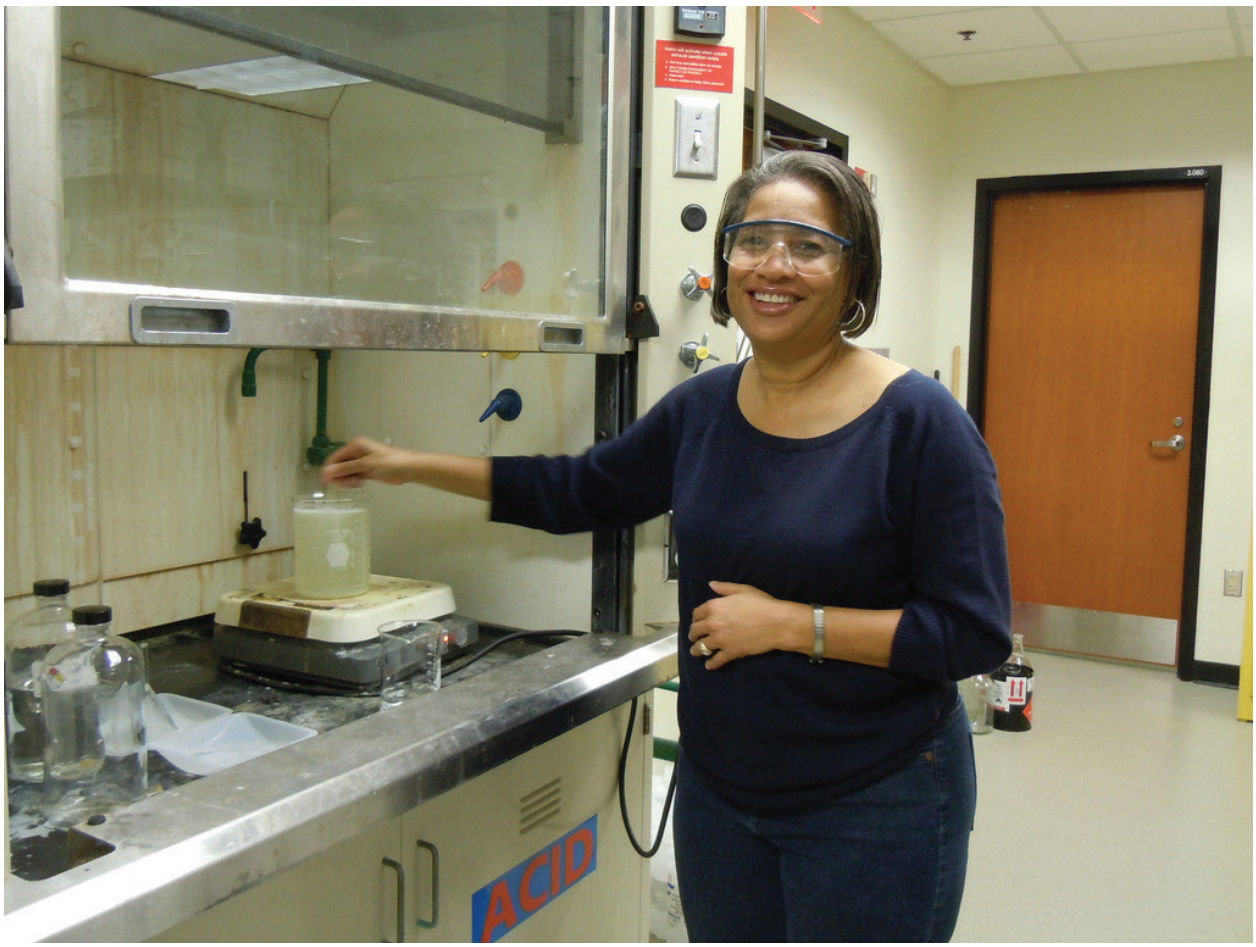
Concrete Introduction of Key Vocabulary
Note: *A vocabulary graphic is provided in this unit for each of the key words. Definitions for all of the key words can be found in the glossary at the back of this program.*

tree diagram

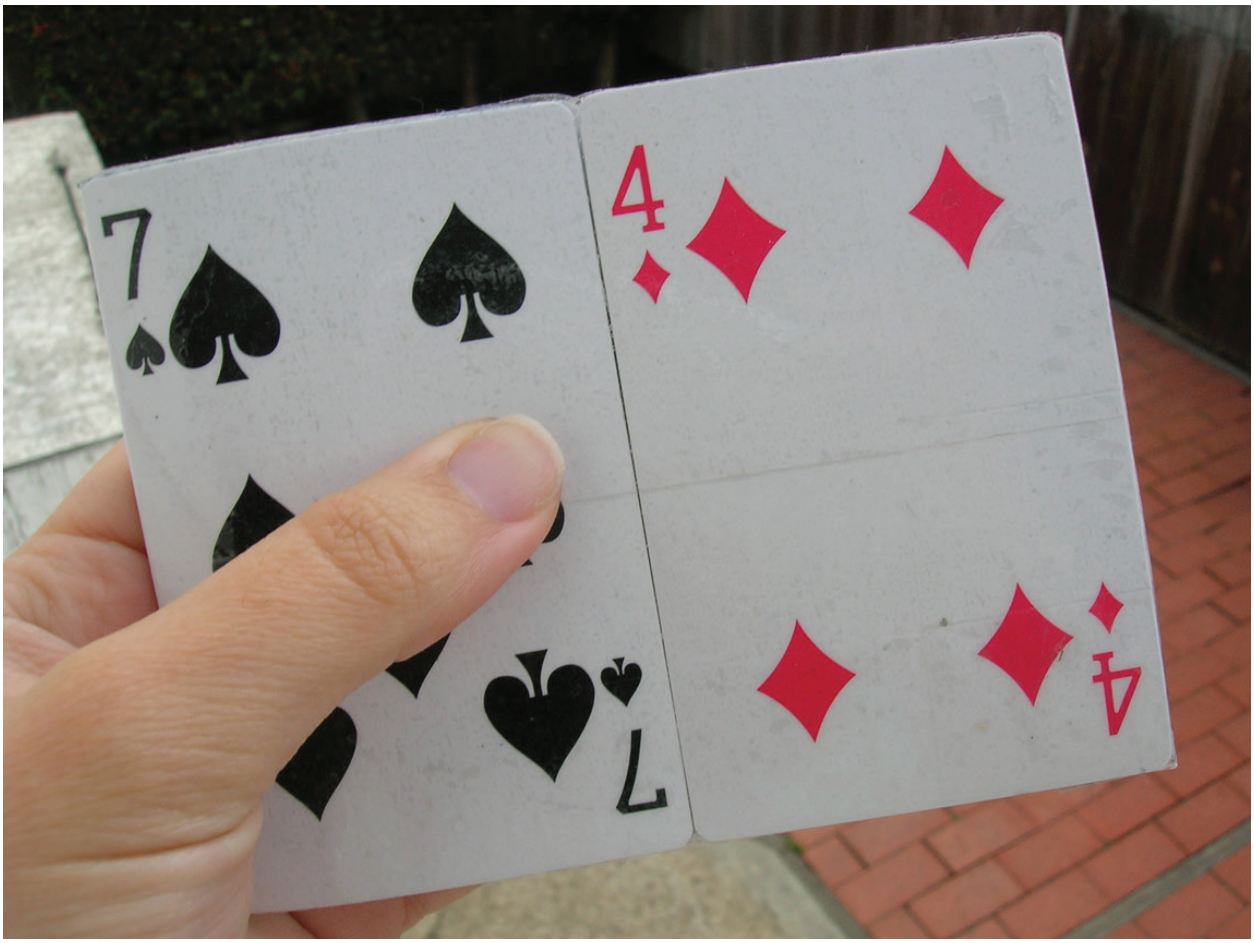
Draw a detailed flower on the board. Under the flower, draws lines to various characteristics that you have the students come up with. Gradually expand to smaller and smaller details. Explain that the diagram helps you to view all of the component parts of the flower. The same can be done to help understand concepts and formulas in math!

VOCABULARY PICTURES

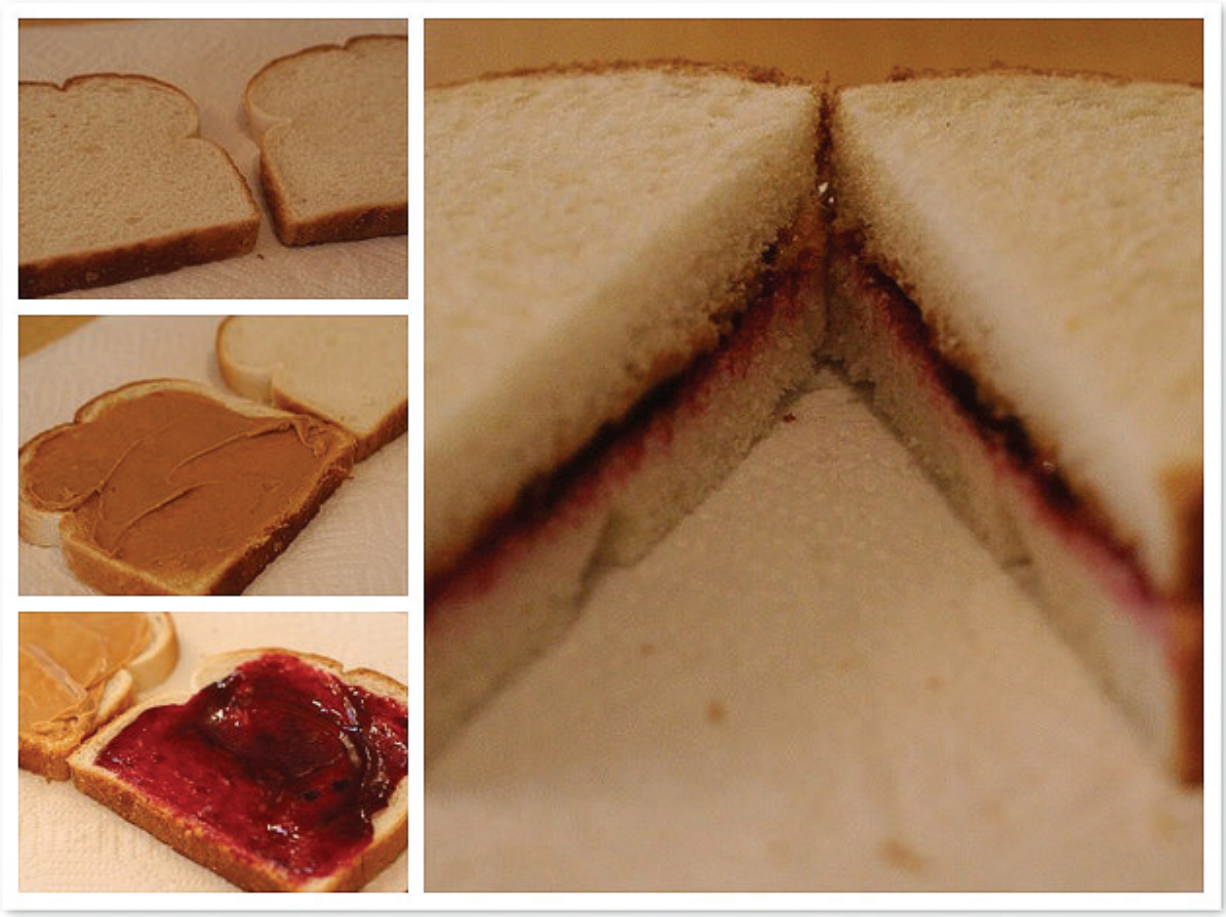
PROBABILITY


ACID

EXPERIMENTAL PROBABILITY


7
4
4
7

THEORETICAL PROBABILITY

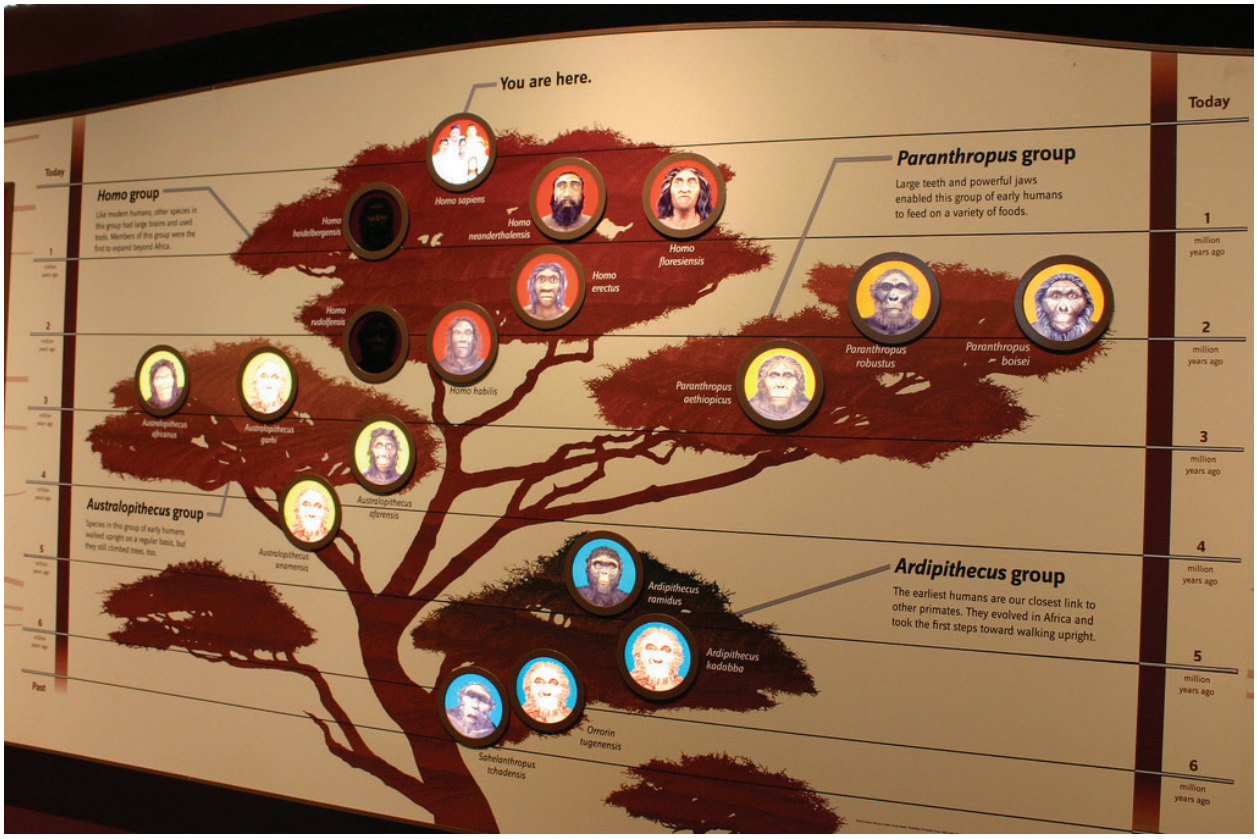


SYSTEMATIC


VALIO
AB
SURMJÖLK

SIMULATION

PREDICTION


You are here.
Today
Homo group
Like modern humans, other species in this group had large brains and used tools. Members of this group were the first to expand beyond Africa.
Homo sapiens
Homo heidelbergensis
Homo neanderthalensis
Homo floresiensis
Homo erectus
Homo rudolfensis
Homo habilis
Paranthropus group
Large teeth and powerful jaws enabled this group of early humans to feed on a variety of foods.
Paranthropus robustus
Paranthropus boisei
Paranthropus aethiopicus
Australopithecus africanus
Australopithecus garhi
Australopithecus afarensis
Australopithecus anamensis
Australopithecus group
Species in this group of early humans walked upright on a regular basis, but they still climbed trees, too.
Ardipithecus ramidus
Ardipithecus kadabba
Orrorin tugenensis
Sahelanthropus tchadensis
Ardipithecus group
The earliest humans are our closest link to other primates. They evolved in Africa and took the first steps toward walking upright.
Past
Today
1 million years ago
2 million years ago
3 million years ago
4 million years ago
5 million years ago
6 million years ago

TREE DIAGRAM

LANGUAGE ACTIVITIES

Language and Skills Development

LISTENING

Review the key math words introduced in this unit. If the vocabulary pictures were not presented during the introduction, show them to the students at this time.

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. Repeat, until the students have responded to each word a number of times.

Student Support Materials

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

Language and Skills Development

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.

Language and Skills Development

READING

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

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

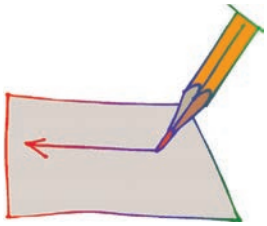
Join all of the students together with string (the students do not need to move from their seats). Before tying the ends of the string together, insert a roll of tape over one of the ends of the string. Tie the ends of the string together. Turn your back to the students. The students should pass the 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

Prepare a page that contains large alphabet letters from A to Z. Make five copies for each student. The students should cut out their letters. When all of the letters have been cut out, show a vocabulary picture. The students should then use their letters to spell the word for that picture. Repeat, using the remaining pictures from this unit. Have the students store their cut out letters in individual envelopes.

Language and Skills Development

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.

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.

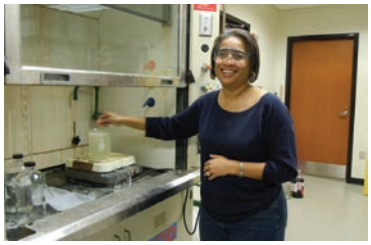
This activity may also be done in team form. In this case, group the students into two teams. Darken the classroom. Use the light of a flashlight to write one of the sight words on the board. When you say "Go," the first player in each team should rush to the board and use chalk to write the same word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

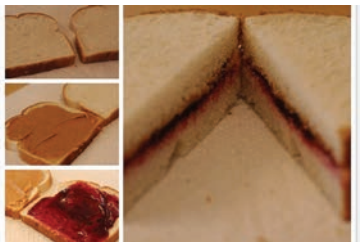
STUDENT SUPPORT MATERIALS

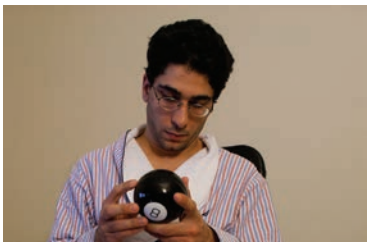
Listening • Mini Pictures

Listening: Mini Pictures

Have the students cut out the pictures. Say the key math words from this unit, and the students should hold up the pictures for them.







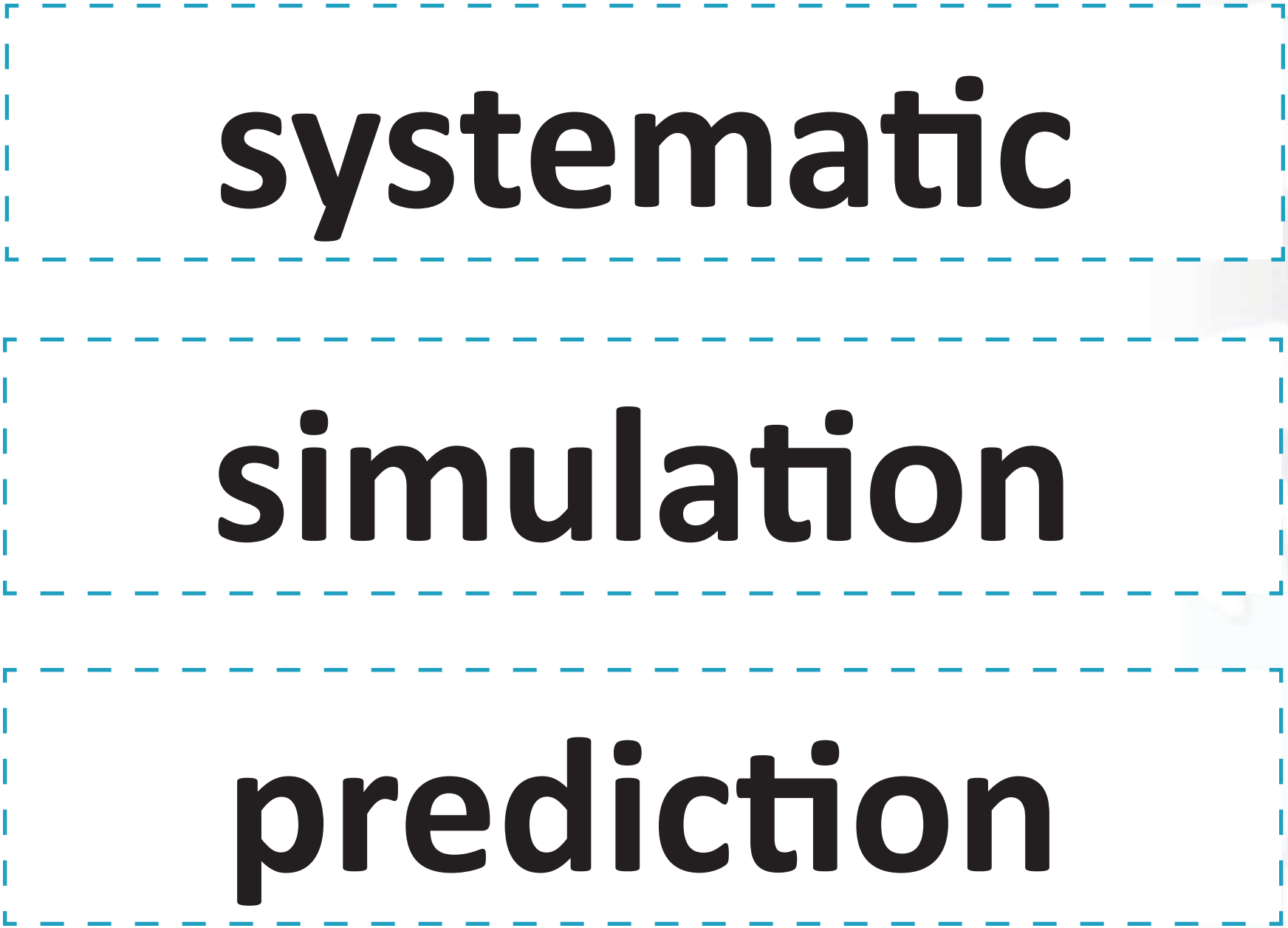
STUDENT SUPPORT MATERIALS

Sight Words

probability

experimental probability

theoretical probability


systematic
simulation
prediction

tree diagram

STUDENT SUPPORT MATERIALS

Reading • Sight Recognition

Sight Words Activity Page

Have the students circle the word for each picture.

probability

experimental probability

theoretical probability

systematic

simulation

prediction

tree diagram

probability

experimental probability

theoretical probability

systematic

simulation

prediction

tree diagram

probability

experimental probability

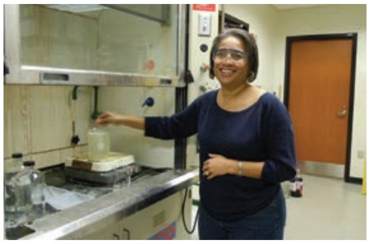
theoretical probability

systematic

simulation

prediction

tree diagram



probability

experimental probability

theoretical probability

systematic

simulation

prediction

tree diagram

probability

experimental probability

theoretical probability

systematic

simulation

prediction

tree diagram

probability

experimental probability

theoretical probability

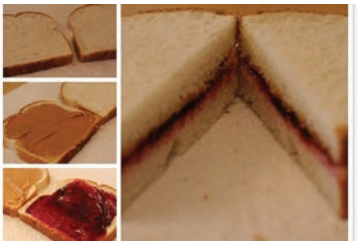
systematic

simulation

prediction

tree diagram

Sight Words Activity Page



probability

experimental probability

theoretical probability

systematic

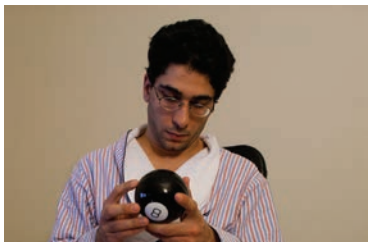
simulation

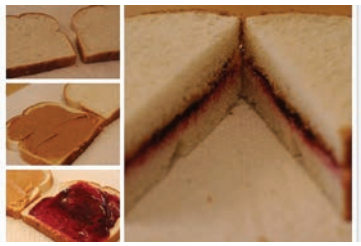
prediction

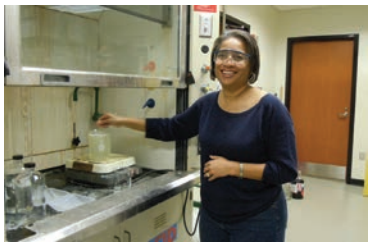
tree diagram

Sight Words Activity Page

Write the numbers on their correct vocabulary graphics.







1. **probability**
2. **experimental probability**
3. **theoretical probability**
4. **systematic**
5. **simulation**
6. **prediction**
7. **tree diagram**

Sight Words Activity Page

Write the key words from this unit horizontally in the boxes (more than one copy of each word can be written). Fill in all other boxes with any letters. Exchange page with another student. Find key words and circle.

Sight Words Activity Page

Highlight or circle the words in this word find.

theoretical probability
probability
experimental probability
prediction
simulation
systematic
tree diagram

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

Sight Words Activity Page

ANSWER KEY

theoretical probability
probability
experimental probability
prediction
simulation
systematic
tree diagram

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

STUDENT SUPPORT MATERIALS

Reading • Encoding

Encoding Activity Page

Have the students cut out the word parts and glue them into their correct words.

pro_____ity

ex_____ental probability

theor_____l probability

sys_____tic

s____lation

perim	iagr	imu
etica	edict	

Encoding Activity Page

pr_____ion

tree d____am

babil **tema**

Encoding Activity Page

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

pro	**lation**
exper	**imental probability**
theore	**bability**
syst	**ee diagram**
simu	**diction**

Encoding Activity Page

pre	**tical probability**
tr	**ematic**

Encoding Activity Page

Cut out and encode the syllables of the words OR number the syllables in their correct sequence.

ba	pro	bi	ty	li

ri	ex	pe	men	tal

bi	ba	ty	pro	li

Encoding Activity Page

o | the | ti | re | cal

_____ _____ _____ _____ _____

ba | bi | pro | ty | li

_____ _____ _____ _____ _____

te | ma | tic | sys

_____ _____ _____ _____

Encoding Activity Page

la si mu tion

_____ _____ _____ _____

dic pre tion

_____ _____ _____

tree ag di ram

_____ _____ _____ _____

STUDENT SUPPORT MATERIALS

Reading Comprehension

What's the Answer?

Read the text and then select the correct answer for it. Fill in the bullet beside the answer of your choice.

1. We hope that the _____of catching many fish this year is high!
   - ❍ Thought
   - ❍ Mood
   - ❍ Probability
   - ❍ Dream

2. What type of probability is derived from many tests in a laboratory?
   - ❍ Theoretical
   - ❍ Elemental
   - ❍ Probably
   - ❍ Experimental

3. What type of probability is derived on the basis of reasoning and not experimentation?
   - ❍ Theoretical
   - ❍ Elemental
   - ❍ Probable
   - ❍ Experiential

4. A systematic method of picking salmonberries is one that is:
   - ❍ Random
   - ❍ Diverse
   - ❍ Methodical
   - ❍ Lame

5. A computer simulation of a float plane trip from Wrangell to Craig is an:
   - ❍ Imitation of the Real Thing
   - ❍ Disaster
   - ❍ Scary Prospect
   - ❍ Real Adventure

What's the Answer?

6 If someone makes a prediction about the weather next winter in Juneau, they are making a

- ❍ Model
- ❍ Mistake
- ❍ Wish
- ❍ Forecast

7 For someone who has never butchered a deer, a _____ _____ may be useful to visualize the process in increasing detail.

- ❍ Tree Stand
- ❍ Tree Branch
- ❍ Tree Diagram
- ❍ Leaf bag

What's the Answer?

ANSWER KEY

1. We hope that the _____of catching many fish this year is high!
   - ❍ Thought
   - ❍ Mood
   - ● Probability
   - ❍ Dream

2. What type of probability is derived from many tests in a laboratory?
   - ❍ Theoretical
   - ❍ Elemental
   - ❍ Probably
   - ● Experimental

3. What type of probability is derived on the basis of reasoning and not experimentation?
   - ● Theoretical
   - ❍ Elemental
   - ❍ Probable
   - ❍ Experiential

4. A systematic method of picking salmonberries is one that is:
   - ❍ Random
   - ❍ Diverse
   - ● Methodical
   - ❍ Lame

5. A computer simulation of a float plane trip from Wrangell to Craig is an:
   - ● Imitation of the Real Thing
   - ❍ Disaster
   - ❍ Scary Prospect
   - ❍ Real Adventure

What's the Answer?

6 If someone makes a prediction about the weather next winter in Juneau, they are making a

- ❍ Model
- ❍ Mistake
- ❍ Wish
- ● Forecast

7 For someone who has never butchered a deer, a _____ _____ may be useful to visualize the process in increasing detail.

- ❍ Tree Stand
- ❍ Tree Branch
- ● Tree Diagram
- ❍ Leaf bag

Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1	The probability that you will win the lottery in your lifetime	A	that a random disorderly process.
2	Experimental probability is determined through	B	on the basis of a mere guess.
3	Theoretical probability is determined on the basis of reasoning	C	the lava flow from a volcano.
4	A systematic process for filleting fish is likely more efficient	D	and not through experimentation.
5	Baking soda and vinegar can be used to simulate	E	experiment.
6	A prediction can be made using proven facts or	F	a process in increasing detail.
7	A tree diagram can be useful to break down the components of	G	is extremely low.

1→_____ 2→ _____ 3→ _____ 4→ _____

5→ _____ 6→ _____ 7→ _____

Reading Comprehension Activity Page

ANSWER KEY

1	The probability that you will win the lottery in your lifetime	A	that a random disorderly process.
2	Experimental probability is determined through	B	on the basis of a mere guess.
3	Theoretical probability is determined on the basis of reasoning	C	the lava flow from a volcano.
4	A systematic process for filleting fish is likely more efficient	D	and not through experimentation.
5	Baking soda and vinegar can be used to simulate	E	experiment.
6	A prediction can be made using proven facts or	F	a process in increasing detail.
7	A tree diagram can be useful to break down the components of	G	is extremely low.

1→ G 2→ E 3→ D 4→ A

5→ C 6→ B 7→ F

Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.

Determined by Experimentation	**Forecast**	**Likelihood**
Graph with increasing detail	**Imitation**	**Methodical**
Determined by Reason		

probability | **experimental probability** | **theoretical probability** | **systematic**

simulation | **prediction** | **tree diagram**

Reading Comprehension Activity Page

ANSWER KEY

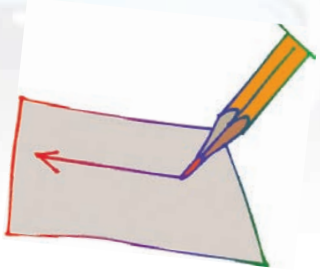
Determined by Experimentation experimental probability	**Forecast** prediction	**Likelihood** probability
Graph with increasing detail tree diagram	**Imitation** simulation	**Methodical** systematic
Determined by Reason theoretical probability		

STUDENT SUPPORT MATERIALS

Writing

Writing Activity Page

Have the students complete the writing of the key math words.



pro_____ility

ex_____imental pr____ability

the_____tical prob_____lity

sys_____atic

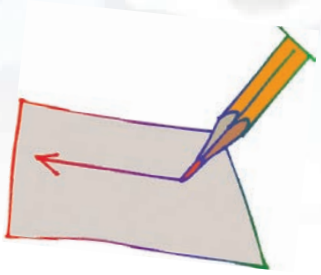
sim_____ion

pr_____tion

tr_____ dia_____am

Writing Activity Page

Have the students complete the writing of the key math words.



p_____y

e_____ p_____y

t_____ p_____y

s_____c

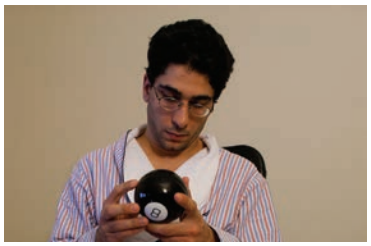
s_____n

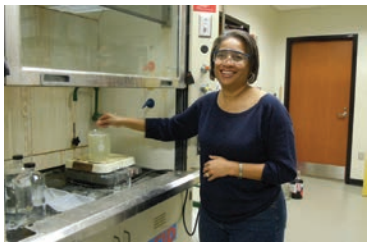
p_____n

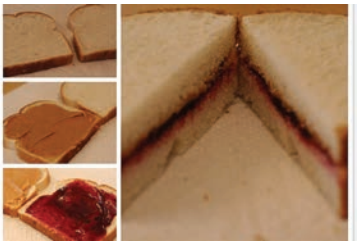
t_____ d_____m

Basic Writing Activity Page

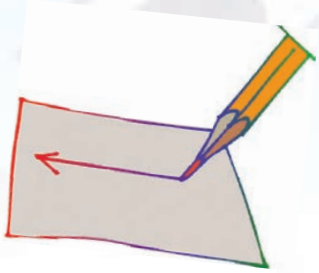
Have the students write the word for each picture.

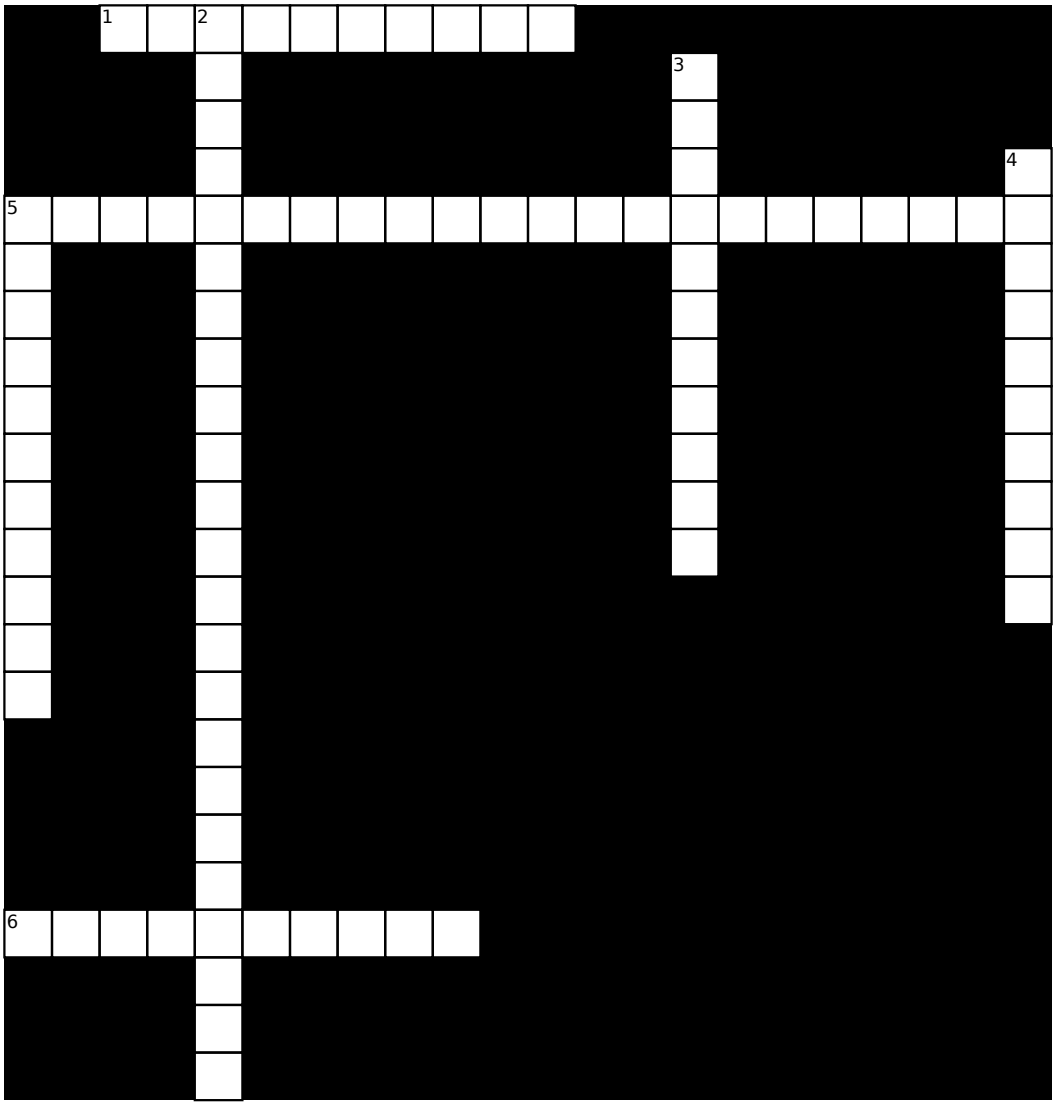






Crossword Puzzle





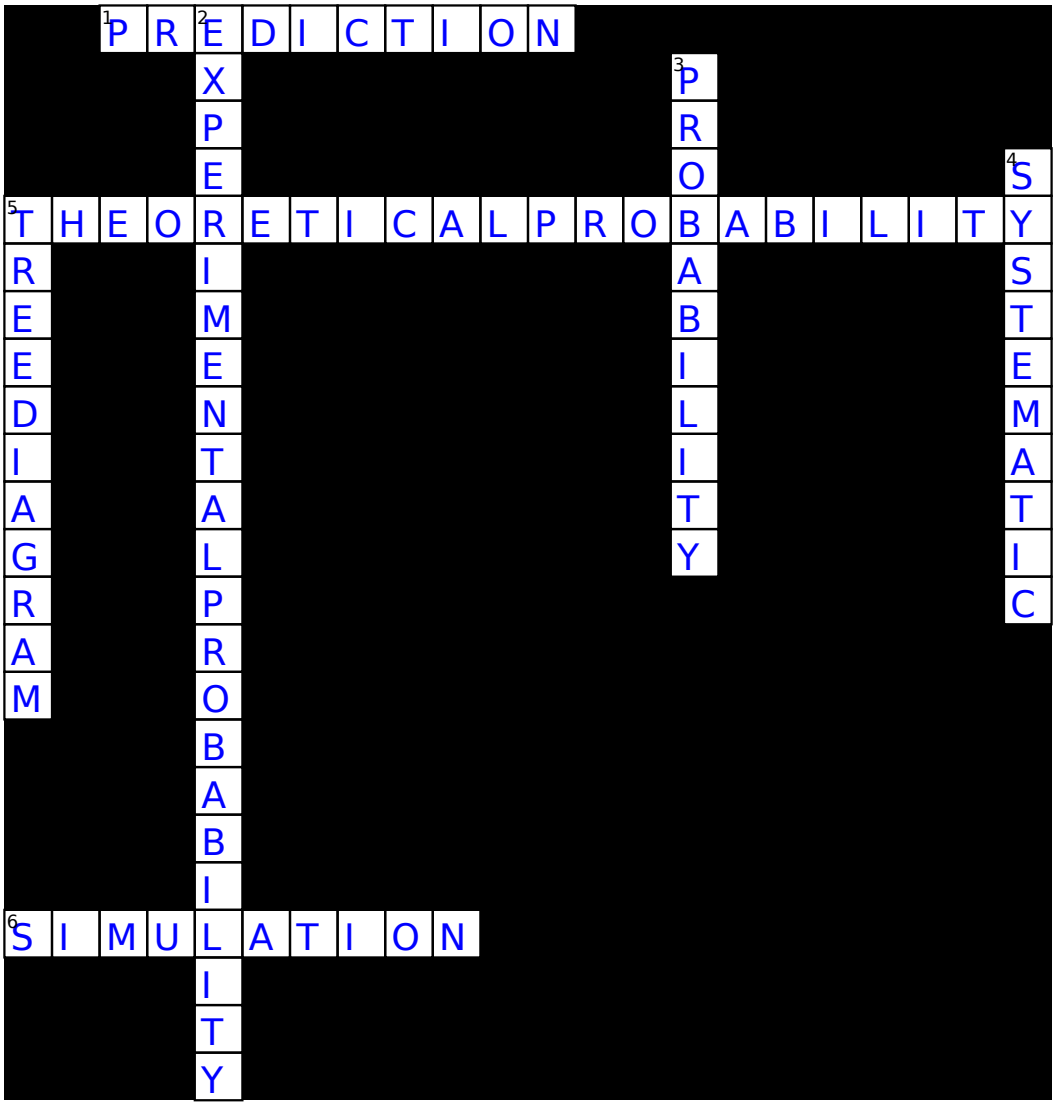
Across

1 Forecast
5 Determined by reason (2 Words)
6 Imitation

Down

2 Determined by experimentation (2 Words)
3 Likelihood
4 Methodical
5 Graph with increasing detail (2 Words)

Crossword Puzzle Answers



Across

1 Forecast
5 Determined by reason (2 Words)
6 Imitation

Down

2 Determined by experimentation (2 Words)
3 Likelihood
4 Methodical
5 Graph with increasing detail (2 Words)

UNIT ASSESSMENT

Probability

Unit Assessment Teacher's Notes
Grade 8 • Unit 13
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 page 1 in your test. Look at the pictures in the boxes.

1. Write the number 1 by the picture for **PROBABILITY**.
2. Write the number 2 by the picture for **EXPERIMENTAL PROBABILITY**.
3. Write the number 3 by the picture for **THEORETICAL PROBABILITY**.
4. Write the number 4 by the picture for **SYSTEMATIC**.
5. Write the number 5 by the picture for **SIMULATION**.
6. Write the number 6 by the picture for **PREDICTION**.
7. Write the number 7 by the picture for **TREE DIAGRAM**.

SIGHT RECOGNITION

Turn to page 2 in your test. Look at the pictures in the boxes. Circle the word for each picture.

DECODING/ENCODING

Turn to page 3 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 4 in your test. Write each word under its definition.
Refer to Student Support Materials for answer key.

BASIC WRITING

Turn to page 5 in your test. Look at the pictures in the boxes. Write the word for each picture.

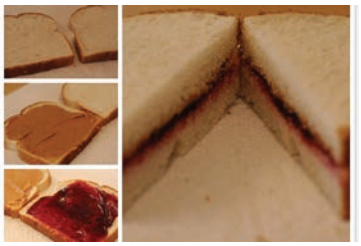
Teacher: To get a percentage for this student's assessment, divide the total number of questions correct by the total number of questions, then multiply this answer by 100 to determine the percentage of questions answered correctly.

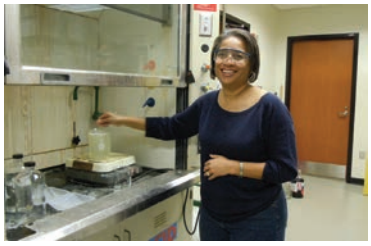
MATH PROGRAM

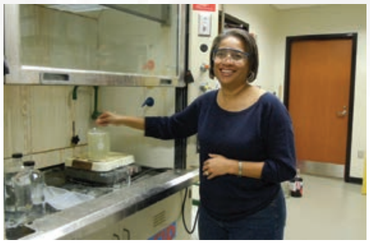
Unit Assessment Student Pages
Grade 8 • Unit 13

Date:_____ **Student's Name:_____**

Number Correct:_____ **Percent Correct:_____**

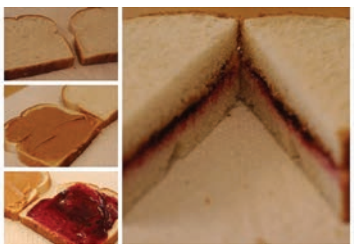






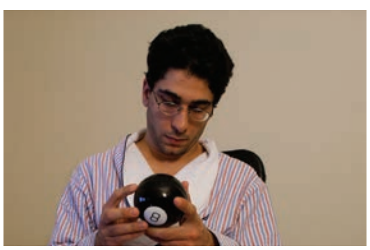
probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram

probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram

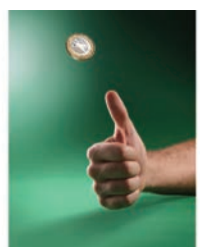


probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram

probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram



probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram



probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram

probability
experimental probability
theoretical probability
systematic
simulation
prediction
tree diagram

probabi____

alty
elty
ilty
olty
ulty
laty
lety
lity
loty

simula____

chin
chen
chan
chon
chun
tian
tien
tion
tiun

theoret____
probability

affy
effy
iffy
offy
uffy
tafy
tefy
ical
tofy

predic____

chin
chen
chan
chon
chun
tian
tien
tion
tiun

experime____
probability

ntla
ntle
ntli
ntlo
ntlu
ntal
ntel
ntil
ntol

tree dia____

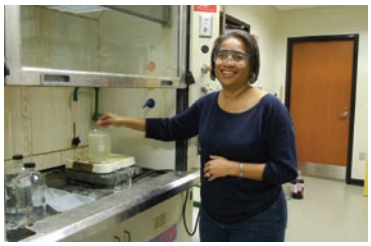
gran
gren
grin
gron
grun
gram
grem
grim
grom

system____

adac
adec
adic
adoc
aduc
atac
atec
atic
atoc

Determined by Experimentation	**Forecast**	**Likelihood**
Graph with increasing detail	**Imitation**	**Methodical**
Determined by Reason		

probability	**experimental probability**	**theoretical probability**	**systematic**
simulation	**prediction**	**tree diagram**	




7
4
4
7