



UNIT 4: Measurement, Estimation & Computation

Estimation & Computation

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.

truncating

Read a very detailed paragraph to the students. Now go around the room and ask the students to paraphrase what was said. Explain that they are truncating the story or “shortening” it. Numbers and operations can sometimes be truncated too!

rounding

Ask the students to pretend that the only coin currency in the U.S. is pennies. Dump a role of pennies on the table and give a student a piece of candy. Now buy the candy from the student for \$0.99. Start counting out pennies until you get to about 30. Then just give the student a dollar bill and say “keep the change.” Explain that rounding up or down often makes life simpler!

estimation

Ask the students how long it would take to get to Anchorage, Alaska by air. Ask if they know this distance to the exact minute or second. Explain that most of them estimated the time.

Process Skills

Concrete Introduction of Key Vocabulary

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appropriateness

Have the students write their names on a piece of paper in pen. Now hand out small erasers and have them erase it. Explain that it is difficult because they should have used a pencil! The appropriateness of the eraser was based on what was used originally. In math, appropriateness applies to most concepts!

percent

Have the students write their whole names on a piece of paper. Now have them make a list of the letters in their name and the number of times that each letter is used. Explain that the frequency that each letter occurs can be represented as a percent. What percent of each student's name is the letter "t"?

ratios

Have the students count the number of objects in the room that are predominantly red and those that are predominantly green. Ask them to express the resulting numbers as a ratio of red items to green items.

Process Skills

Concrete Introduction of Key Vocabulary

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proportions

Have each student draw a stick figure of any size on the board. Ask what proportion of students chose to draw very small figures. Large figures?



VOCABULARY PICTURES





TRUNCATING





ROUNDING





ESTIMATION





APPROPRIATENESS





PERCENT





RATIOS





PROPORTIONS



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.



Change

Group the students in pairs. There should be one student without a partner to be “it” for the first round of the activity. Have the students in each pair stand back to back, with elbows interlocked. Tell the students to listen for a specific word, sequence of words, or sentence. When the students hear the word, sequence, or sentence you said at the beginning of the round, they should drop arms and quickly find new partners. However, “it” must also find a partner—thus producing a new “it” for the next round of the activity.

Wild Cars

Make two “roads” on the floor using masking tape. Be certain that there are a number of curves and circles in the roads. The roads should stretch for at least ten feet. If you have a floor rug, chalk may be used to fashion the roads. Place a toy car at the beginning of each road. Lay the vocabulary pictures at the end of the roads. Have a student sit beside each car. Name one of the vocabulary pictures and say “Go.” The two students should “drive” their cars along the roads as quickly as they can. The winner is the player who first parks his car on the picture for the vocabulary word you said.

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



Cat's Cradle

Group the students in a circle, sitting on the floor. Provide each student with a vocabulary picture (prepare extra pictures if necessary). The students should stand their vocabulary pictures on the floor, leaning against their legs. Give a student in the circle a ball of string. The student should hold the end of the ball of string and then say the name of a vocabulary picture that another student has. After identifying the picture, he/she should then toss the ball of string to the student who has that picture (being careful to hold tightly to his/her end of the string). The student who receives the ball of string must then repeat this process—tossing the ball of string to another student in the circle. The students should continue in this way until a “cat’s cradle” has been created with the string in the center of the circle. This activity may be repeated more than once by collecting and redistributing the pictures for each new round.

Roll ‘Em Again!

Mount the vocabulary pictures on the board. Number each picture from one to six (repeat a number as often as necessary). Then, group the students into two teams. Give the first player in each team a die. When you say “Go,” the first player in each team must roll his/her die. He/She should call the number showing on it and then say a complete sentence about a vocabulary picture on the board that has the same number. Repeat this process until all students have participated.

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.



Configurations

Before the activity begins, print the sight words on an overhead transparency sheet (fill the transparency with words). Place the transparency on an overhead projector and project the sight words onto the board. Review the sight words with the students. Then, outline each of the sight words on the board with chalk. When a configuration has been created for each sight word, turn the overhead projector off. Then, point to one of the configurations and call upon a student to identify the sight word for the configuration. Continue in this way until all of the sight words have been correctly identified. You may wish to turn the projector on momentarily to verify a student's response.

Letter Encode

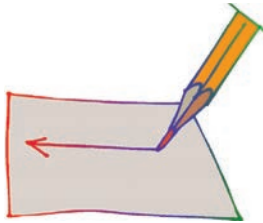
Give each student his/her envelope that contains the alphabet letters. Show a picture from this unit. The students must use the cut-out letters to spell the word for the picture. Review the students' work. Repeat, until all of the words have been spelled.

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

WRITING



Watch Your Half

Prepare a photocopy of each of the vocabulary pictures. Cut the photocopied pictures in half. Keep the picture halves in separate piles. Group the students into two teams. Give all of the picture halves from one pile to the players in Team One. Give the picture halves from the other pile to the players in Team Two. Say a vocabulary word. When you say “Go,” the student from each team who has the picture half for the vocabulary word you said should rush to the board and write the word on the board. The first player to do this correctly wins the round. Repeat until all players have participated. This activity may be played more than once by collecting, mixing, and redistributing the picture halves to the two teams.

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.

Student Support Materials

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



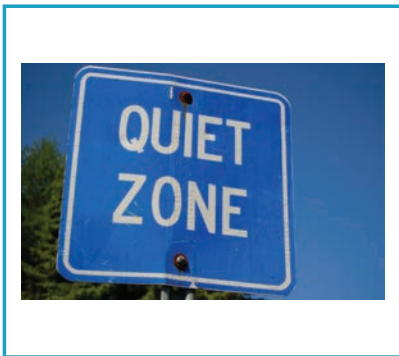
STUDENT SUPPORT MATERIALS

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



truncating

rounding

estimation





appropriateness

percent

ratios



proportions





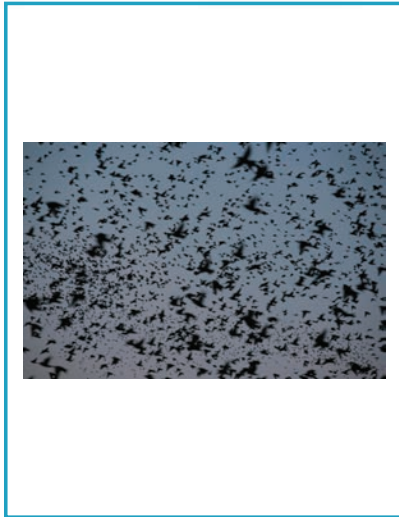
STUDENT SUPPORT MATERIALS

Reading • Sight Recognition

Sight Words Activity Page



Have the students circle the word for each picture.



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions

Sight Words Activity Page

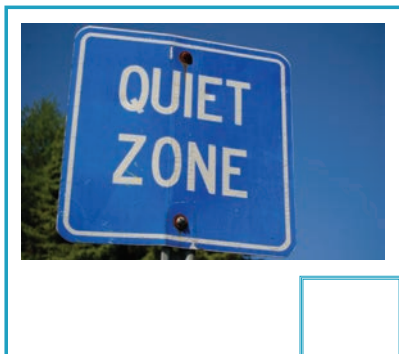


truncating
rounding
estimation
appropriateness
percent
ratios
proportions

Sight Words Activity Page



Write the numbers on their correct vocabulary graphics.



1. truncating
2. rounding
3. estimation
4. appropriateness
5. percent
6. ratios
7. proportions

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.

proportions
ratios
appropriateness

rounding
percent
estimation

truncating

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

Sight Words Activity Page



ANSWER KEY

proportions
ratios
appropriateness

rounding
percent
estimation

truncating

i n e m n s r i p n a i a o s u p a s t g e o u t
t i s p r r e s i o e e n e i g s e o e a t t e t
a p p r o p r i a t e n e s s o n s n n n m r r t
p r r e i o p a r o t **r a t i o s** g r p s s s p p
t i s d e r s n o r o r g t a o t o r r n n i u a
t a o r d n e t a e s i s s p i p r t p e r m r s
o n i t e o u o n g a e a o r i r i r r o o p t i
p i m e i e e n t m n t o i e t t n p o o r a o t
s s i r r c n r i a r t a i o i p i i p g o n n t
r p a a t t a e t s r n n n i m d n g m t a i o t
t s c o s t s a p c p n g t e r e g o t r o t n o
t e c o u e t s n n t n i o n i r t t n t a e a p
p a p s o p i c t o c r o u n d i n d o n i p e i
u r r p r o c t d s p t i r a t o a p e i t g e r
u o p o e n a m s o **r o u n d i n g** o r p i t t o
g n s s r a o r s o i p o i a u o t n t o g m r t
n **t r u n c a t i n g** a p r p r a n i p u n a u d
o a r **e s t i m a t i o n** t r t e p c n n p p r t
p r a r g n r i o i i g e s t i m a t i i r r e p
n n t r a t i n i t t n i i n r p s o o r p r n p
n r p i p i r t s a p p r o p r i a t e n e s d i
p e r c e n t p p t t r n r n t i r r p t p i a n
n t p p n p i e t t t o r n t r u n c a t i n a n
t n p i a e g r a g r a r s i a r s i p o r r n o
p i r o e r m r n r t a o i s o n p n e e s n s
e **p r o p o r t i o n s** i g n i t r t i a a o p e
i t n r t r i r p t n o i o p o r r r a t p n n o
t p r o p o r t i o n r c e n g n r a o d p p a i
o t t e i s u n i s i i p e r c e n o p i e t t p
o i n e s p n i a c s o m a i r a o o n i s r g n



STUDENT SUPPORT MATERIALS

Reading • Encoding

Encoding Activity Page

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



trun_____g

R_____ng

est_____ion

ap_____eness

p_____t

propr	iat	ound	i	cat	in
-------	-----	------	---	-----	----

port	ercen
------	-------



Encoding Activity Page



r _____ OS

Pro _____ ions

imat ati

Encoding Activity Page



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

trun

imation

ro

cating

est

ortions

approp

unding

pe

riateness



Encoding Activity Page



ra

rcent

prop

tios

Encoding Activity Page



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

ting || ca || trun

ding || roun

ti || es || tion || ma

Encoding Activity Page



prop ap ate ness

ri

per cent

Encoding Activity Page



tios || ra

tions || por || pro



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 Another word for shortening or cutting off a part of something is _____ it.
 - Lengthening
 - Rotating
 - Following
 - Truncating

- ② If you picked 5.963 bushels of blueberries and someone asked you how much you picked, you're likely to just say 6 bushels. This is an example of
 - Lying
 - Reversing
 - Exaggerating
 - Rounding

- ③ You don't know exactly how much fuel you would need to get from Hollis to Metlakatla by boat but you guess it will cost about \$100. You are using
 - Luck
 - Measurements
 - Estimation
 - Nonsense

- ④ The _____ of language used to speak to our elders is important.
 - Volume
 - Appropriateness
 - Complexity
 - Bashful

- ⑤ What _____ of people in Alaska prefer winter to summer?
 - Percent
 - Likelihood
 - Cause
 - Intelligence

What's the Answer?



- ⑥ The ratio of people living in Alaska compared to the lower 48 is quite _____.
- Large
 - Small
 - Happy
 - Equal
- ⑦ The discovery of life on other planets would be a discovery of epic _____.
- Livelihood
 - Rate
 - Proportions
 - Linkages

What's the Answer?

ANSWER KEY



- ① Another word for shortening or cutting off a part of something is _____ it.
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 - Rotating
 - Following
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 - Linkages

Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.



- | | |
|--|---|
| ① Truncating a lengthy novel means taking the key points | ① may be different depending on the occasion. |
| ② In real life, it is often easier to | ② is usually fairly consistent. |
| ③ If an exact number is not known, it is | ③ appears to be increasing. |
| ④ The appropriateness of one's tone of voice | ④ should be relatively small. |
| ⑤ The percentage of adults with college loans | ⑤ often necessary to use estimation. |
| ⑥ The ratio of arm length to leg length on a human being | ⑥ round to the nearest whole number rather than use decimals. |
| ⑦ The proportion of dessert food as compared to whole grains in a diet | ⑦ and making the story shorter. |

1 → _____ 2 → _____ 3 → _____ 4 → _____
5 → _____ 6 → _____ 7 → _____

Reading Comprehension Activity Page

ANSWER KEY



- | | | | |
|--|--|---|---|
| ① Truncating a lengthy novel means taking the key points | ⑦ The proportion of dessert food as compared to whole grains in a diet | Ⓐ may be different depending on the occasion. | Ⓒ appears to be increasing. |
| ② In real life, it is often easier to | ④ The appropriateness of one's tone of voice | Ⓑ is usually fairly consistent. | Ⓓ should be relatively small. |
| ③ If an exact number is not known, it is | ⑤ The percentage of adults with college loans | Ⓔ often necessary to use estimation. | Ⓕ round to the nearest whole number rather than use decimals. |
| ⑥ The ratio of arm length to leg length on a human being | | Ⓖ and making the story shorter. | |

1→ G 2→ F 3→ E 4→ A
5→ C 6→ B 7→ D

Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.



Replacing with a close approximation

Quotient to compare quantities of same units

A rough calculation

Comparative relation to a whole

Shortening

Proportion in relation to a whole

Suitable or fitting

truncating	rounding	estimation	appropriateness
percent	ratios	proportions	



Reading Comprehension Activity Page

ANSWER KEY



Replacing with a close approximation

rounding

Quotient to compare quantities of same units

ratios

A rough calculation

estimation

Comparative relation to a whole

proportions

Shortening

truncating

Proportion in relation to a whole

percent

Suitable or fitting

appropriateness

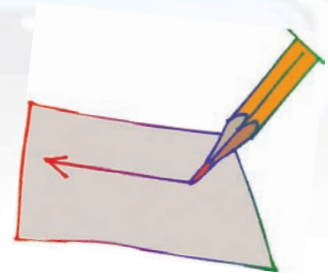


STUDENT SUPPORT MATERIALS

Writing

Writing Activity Page

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



trun_____ng

r_____ding

esti_____on

ap_____riateness

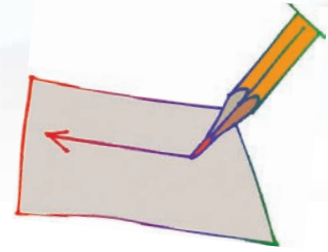
per_____t

r_____ios

pro_____ions

Writing Activity Page

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



t _____ **g**

r _____ **g**

es _____ **n**

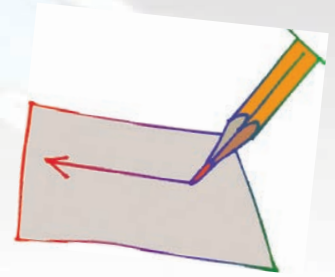
ap _____ **s**

p _____ **t**

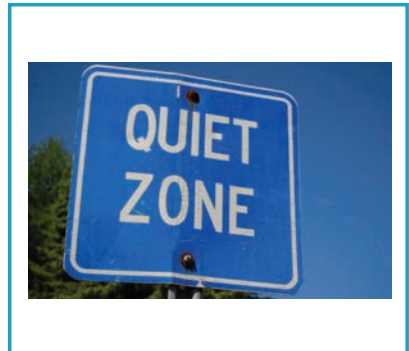
ra _____ **s**

pr _____ **s**

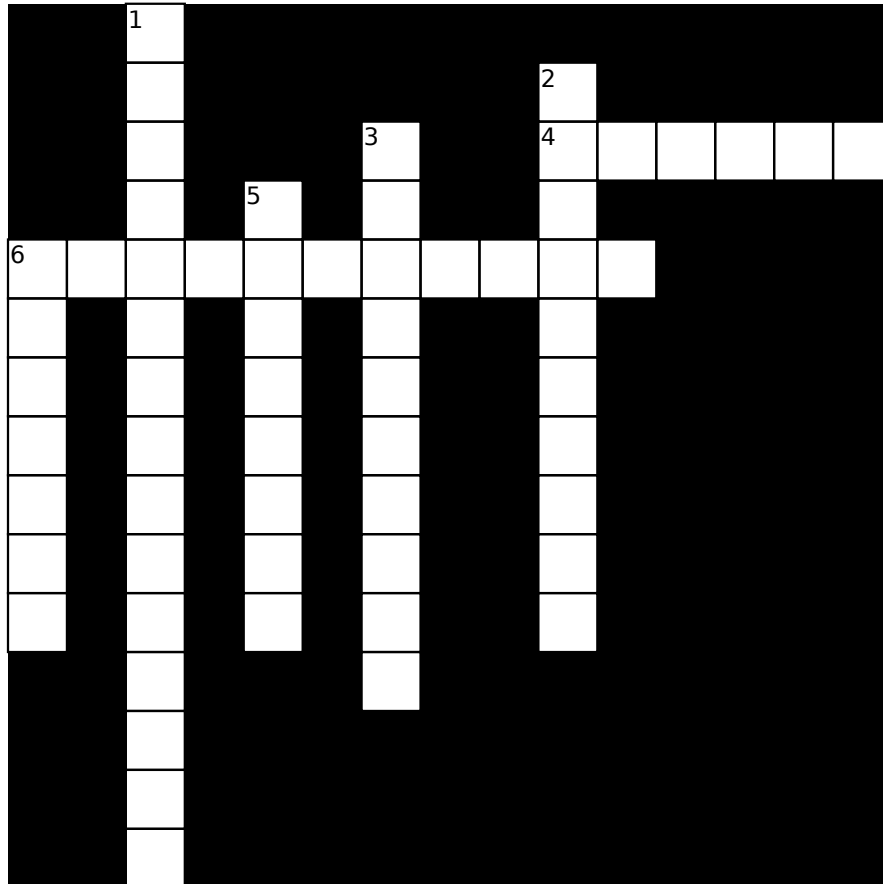
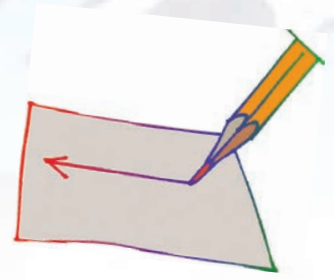
Basic Writing Activity Page



Have the students write the word for each picture.



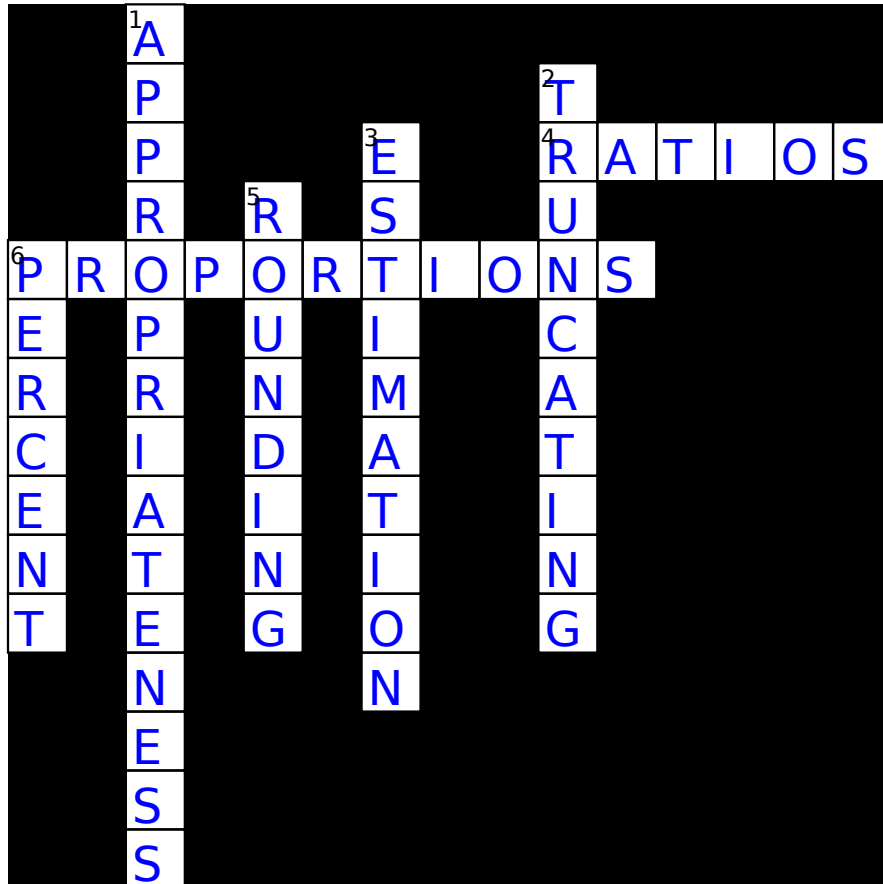
Crossword Puzzle



- 4 Across
Quotient to compare quantities of same units
- 6 Comparative relation to a whole

- 1 Down
Suitable or fitting
- 2 Shortening
- 3 A rough calculation
- 5 Replacing with a close approximation
- 6 Proportion in relation to a whole

Crossword Puzzle Answers



- | | |
|---|---|
| <p>4 Across
Quotient to compare quantities of same units</p> <p>6 Comparative relation to a whole</p> | <p>1 Down
Suitable or fitting</p> <p>2 Shortening</p> <p>3 A rough calculation</p> <p>5 Replacing with a close approximation</p> <p>6 Proportion in relation to a whole</p> |
|---|---|



UNIT ASSESSMENT



Estimation & Computation

Unit Assessment Teacher's Notes

Grade 8 • Unit 4

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 **TRUNCATING**.
2. Write the number 2 by the picture for **ROUNDING**.
3. Write the number 3 by the picture for **ESTIMATION**.
4. Write the number 4 by the picture for **APPROPRIATENESS**.
5. Write the number 5 by the picture for **PERCENT**.
6. Write the number 6 by the picture for **RATIOS**.
7. Write the number 7 by the picture for **PROPORTIONS**.

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 4

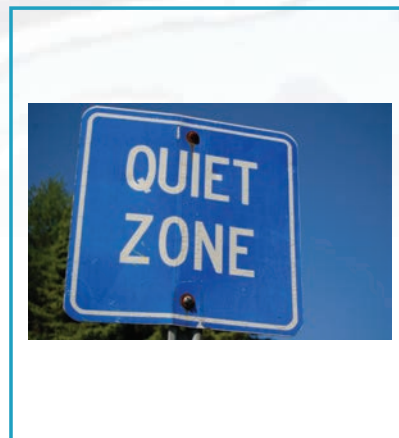
Date: _____ Student's Name: _____

Number Correct: _____ Percent Correct: _____





truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



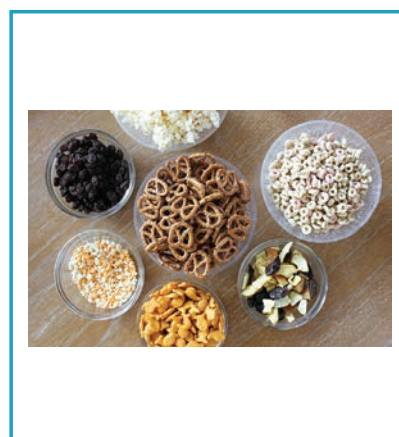
truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions



truncating
rounding
estimation
appropriateness
percent
ratios
proportions

trunca_____

stang
steng
sting
stong
stung
tang
teng
ting
tong

roun_____

tang
teng
ting
tong
tung
dang
deng
ding
dong

estima_____

chin
chen
chan
chon
chun
tian
tien
tion
tiun

per_____

sant
sent
sint
sont
sunt
cant
cent
cint
cont

appropriate_____

nas
nes
nis
nos
nus
nass
ness
niss
noss

ra_____

shase
shese
shise
shose
shuse
tias
ties
tiis
tios

proport_____

ans
ens
ins
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Replacing with a close approximation

Quotient to compare quantities of same units

A rough calculation

Comparative relation to a whole

Shortening

Proportion in relation to a whole

Suitable or fitting

truncating

rounding

estimation

appropriateness

percent

ratios

proportions

