



UNIT 5: Functions & Relationships

Describing Patterns & Functions

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.

linear patterns

Have each student choose a number from one to ten. Now give them three minutes to make a list of numbers starting at zero and adding that number over and over again. Explain that this is a linear pattern since there is the same amount between each number. Who got to the highest number? Who had the most additions?

tables

Draw a table on the board of student ages, genders, and favorite subjects. Now write those same data in a jumbled mess. Explain that tables help us to compile and order data.

sequences

Have students describe how the weather changes throughout the year and what activities they do throughout the year. Explain that there is a repeating “sequence” to the seasons.

Process Skills

Concrete Introduction of Key Vocabulary

Note: A vocabulary graphic is provided in this unit for each of the key words.

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graphs

Ask the students to go around the room and make a list of how many girls and how many boys have green on their shoes. Now ask them to draw this as a graph on their paper. Explain that graphs help us to easily view a set of data!

ordered pairs

Show the students a map and have them point to a specific location that they'd like to visit. Explain that the point is a unique ordered pair on the earth giving a direction north/south and east/west. Explain that these "coordinates" are ordered pairs.

quadrilateral

Explain to the students that a quadrilateral is a polygon with four sides and four corners. Have the students fill a piece of paper with quadrilaterals and have them judge the best designs!

Process Skills

Concrete Introduction of Key Vocabulary

Note: A vocabulary graphic is provided in this unit for each of the key words.

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rectangular prism

Using only tin foil and masking tape, ask each student to build a rectangular prism after being told the definition. Which two look the most alike and which two are the most different? What similarities do they all share?



VOCABULARY PICTURES





LINEAR PATTERNS



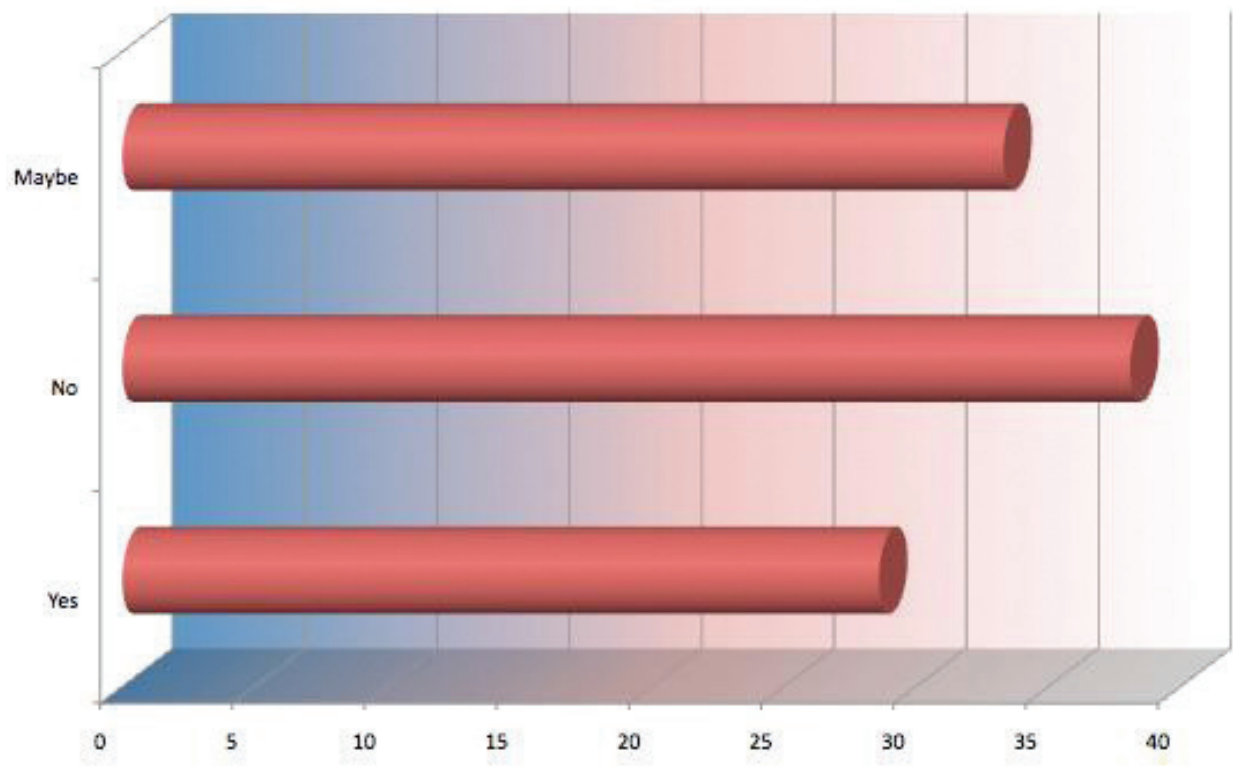


TABLES



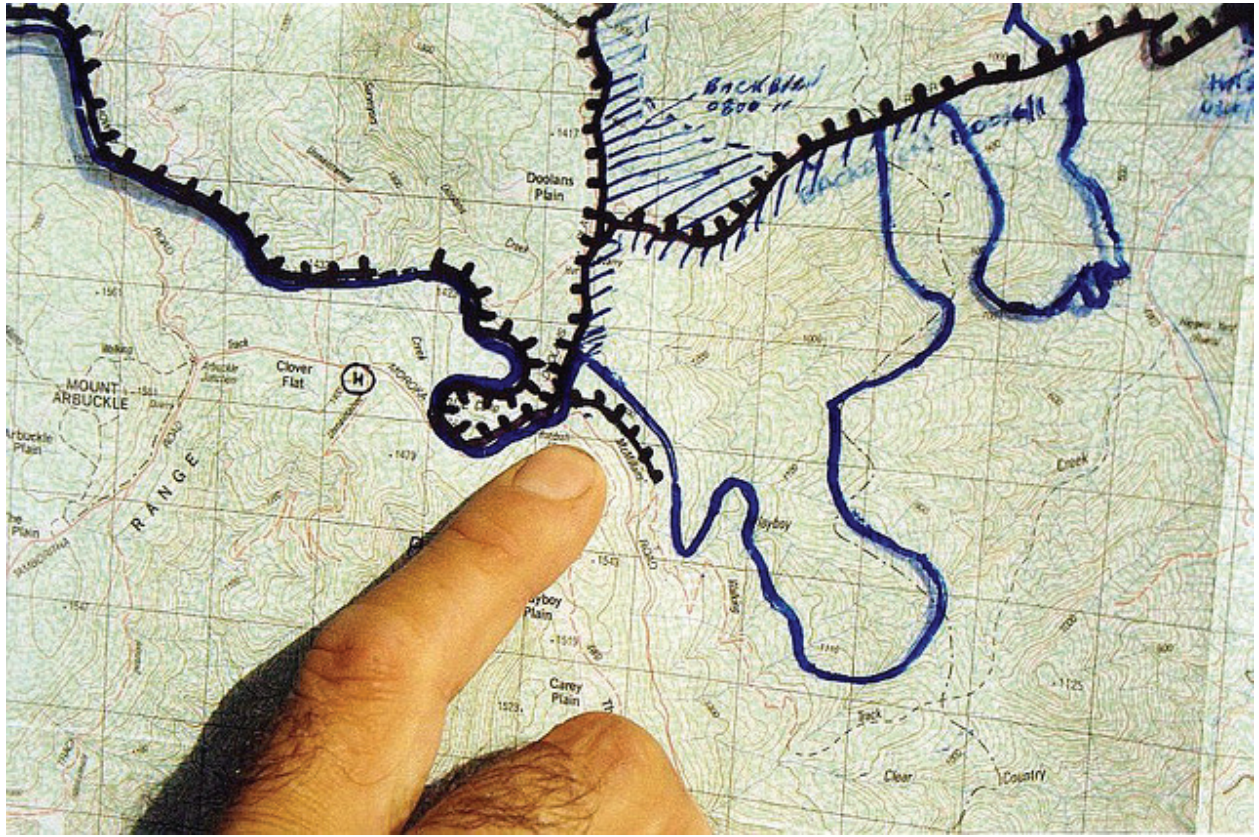


SEQUENCES





GRAPHS





ORDERED PAIRS





QUADRILATERAL





RECTANGULAR PRISM



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.



Turn and Face

Mount the vocabulary pictures on the walls and board. Group the students together in the center of the classroom. Say one of the vocabulary words and the students should turn to face the picture for the word you said. Depending upon the size of your class, this activity may be done in small groups. This activity may also be done in team form. In this case, have a player from each team stand in the center of the classroom. When a player faces the wrong direction (i.e., the wrong picture), he/she is “out” until a later round of the activity. Repeat until all players have had an opportunity to participate.

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



Balloon Volleyball

Group the students into two teams. The two teams should stand, facing one another. Toss a round, inflated balloon to the members of Team One. The members of Team One must then bounce the balloon to the members of Team Two. The players should continue to bounce the balloon back and forth in this way until a team loses the balloon. You may wish to establish the rule that players may not move their feet during the activity. When a team loses the balloon, show them a vocabulary picture and all team members in that team must say the vocabulary word for it. Repeat until players in both teams have responded a number of times.

Slip String

Mount the vocabulary pictures on the board. Join all of the students together with a long length of string. Before tying the ends of the string together, insert a roll of tape over one end of the string (a large washer can also be used). Then, tie the ends of the string together. Face away from the students. The students should then pass the roll of tape as quickly as possible along the string. When you clap your hands, the student who is holding the roll of tape, must identify (orally) a vocabulary picture you point to. For added motivation, you may wish to place more than one roll of tape (or washer) on the line of string. Repeat until many students have responded.

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.



Deal

Before the activity begins, obtain two decks of playing cards. Give all of the cards from one deck to the students (if possible, arrange it so that all students have the same number of cards). Mount the sight words on the board. Hold a playing card from the other deck of cards against one of the sight words on the board. The student who has the matching playing card must identify the sight word. When the student has done this correctly, he/she should place that playing card to the side. Continue in this way until a student or students have no playing cards left in their hands.

Letter Encode

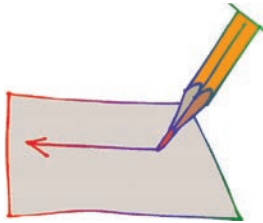
Give each student his/her envelope that contains the alphabet letters. Show a picture from this unit. The students must use the cut-out letters to spell the word for the picture. Review the students' work. Repeat, until all of the words have been spelled.

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



Mirror Writing

Group the students into two teams. Have the first player from each team stand in front of the board. Give each of the two players a small, unbreakable mirror. Stand some distance behind the two players with pictures for the sight words. Hold up one of the pictures. When you say “Go,” the players must use the mirrors to look over their shoulders to see the picture you are holding. When a player sees the picture, he/she must write the sight word for that picture on the board. The first player to do this correctly wins the round. Repeat this process until all players in each team have had an opportunity to respond.

Yarn Spell

Group the students into two teams. Give the first player in each team lengths of yarn or string. Say a vocabulary word. When you say “Go,” the first player in each team must then use the yarn or string to “write” the word on the floor. The first player to complete his/her word wins the round. Repeat this process until all players in each team have played. If pipe cleaners are available, they may be used in place of the yarn or string (have both long and short lengths of the pipe cleaners ready for 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.



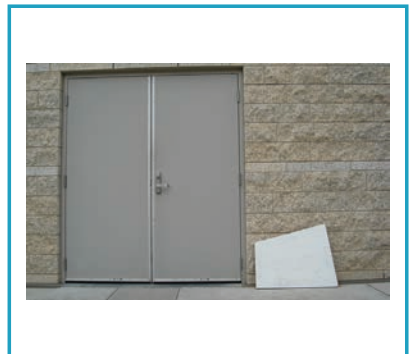
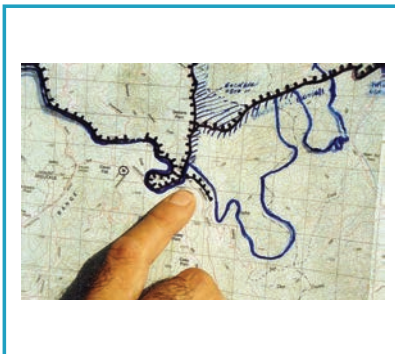
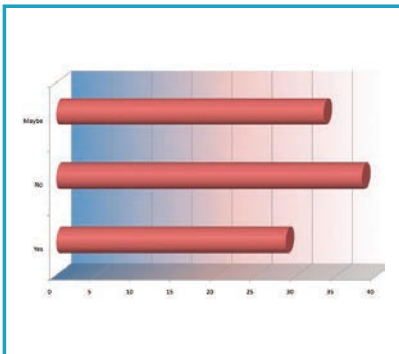
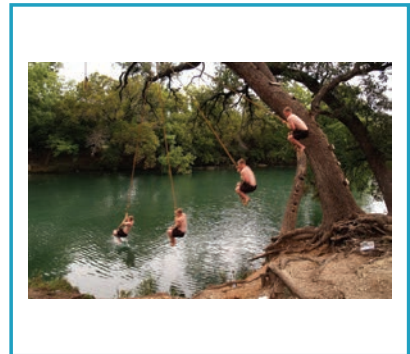
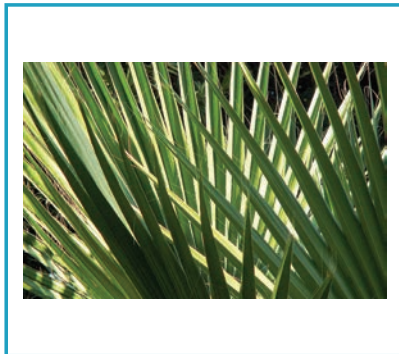
STUDENT SUPPORT MATERIALS

Listening • Mini Pictures

Listening: Mini Pictures



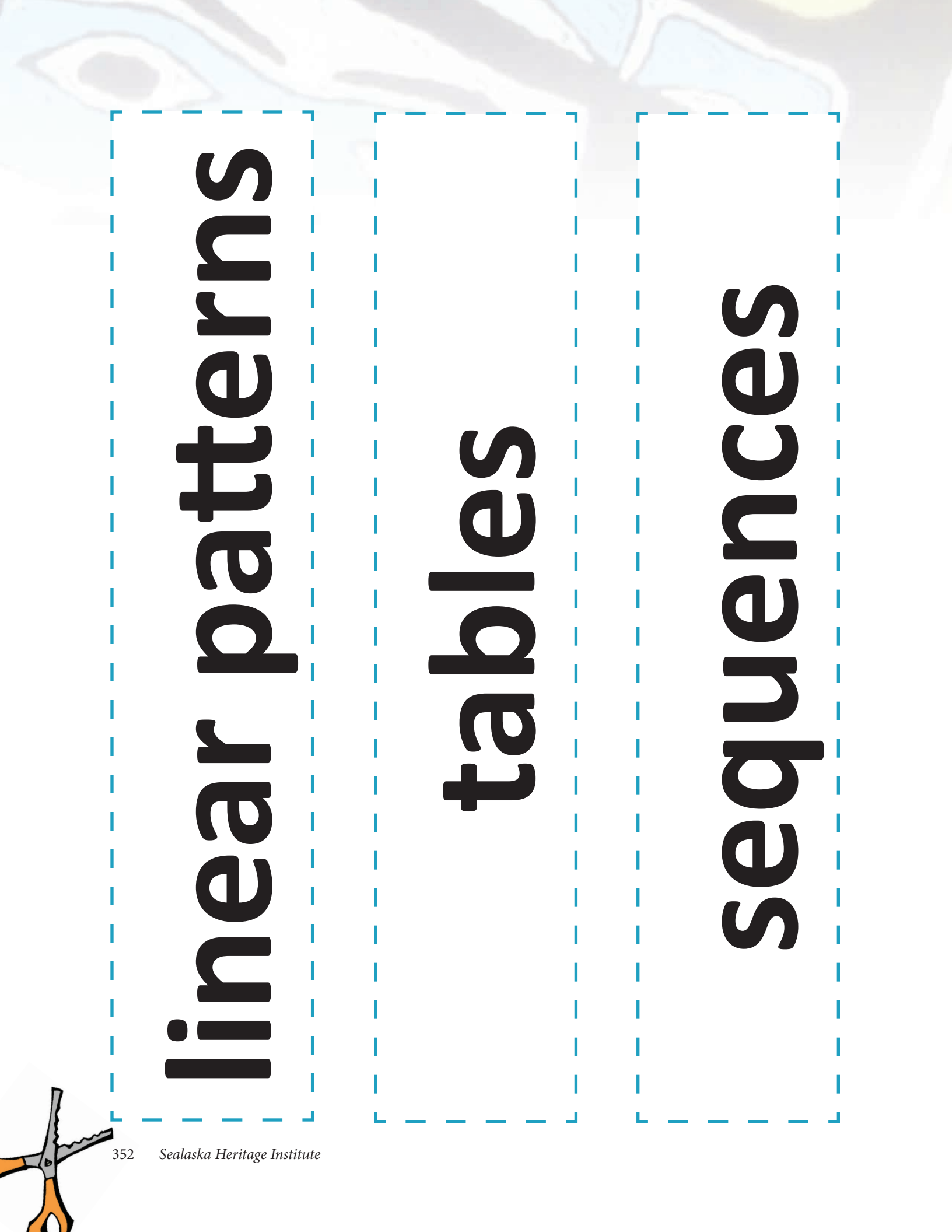
Have the students cut out the pictures. Say the key math words from this unit, and the students should hold up the pictures for them.





STUDENT SUPPORT MATERIALS

Sight Words



linear patterns

tables

sequences



graphs

ordered pairs

quadrilateral



rectangular prism





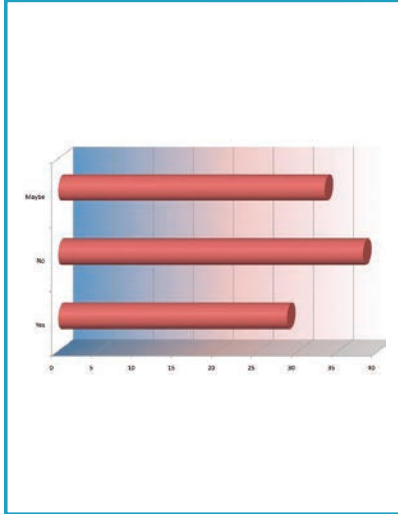
STUDENT SUPPORT MATERIALS

Reading • Sight Recognition

Sight Words Activity Page



Have the students circle the word for each picture.



linear patterns
tables
sequences
graphs
ordered pairs
quadrilateral
rectangular
prism



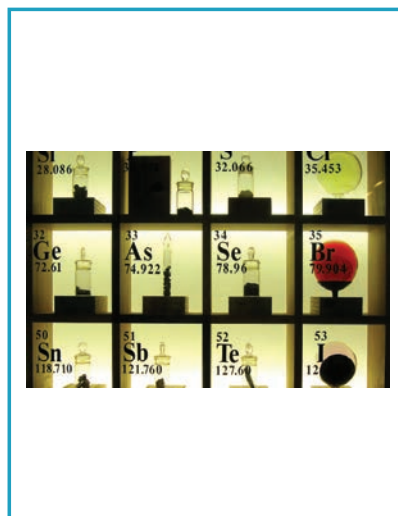
linear patterns
tables
sequences
graphs
ordered pairs
quadrilateral
rectangular
prism



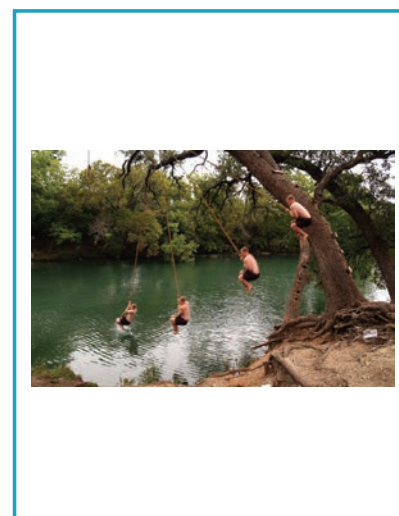
linear patterns
tables
sequences
graphs
ordered pairs
quadrilateral
rectangular
prism



linear patterns
tables
sequences
graphs
ordered pairs
quadrilateral
rectangular
prism

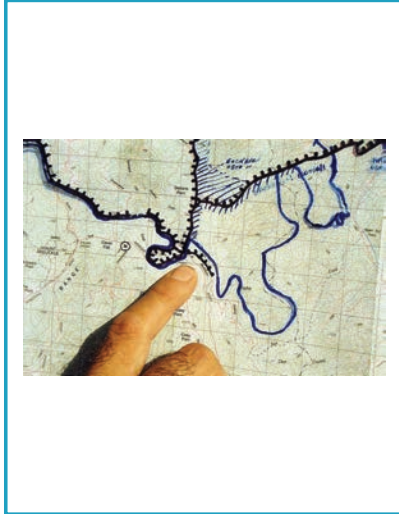


linear patterns
tables
sequences
graphs
ordered pairs
quadrilateral
rectangular
prism



linear patterns
tables
sequences
graphs
ordered pairs
quadrilateral
rectangular
prism

Sight Words Activity Page

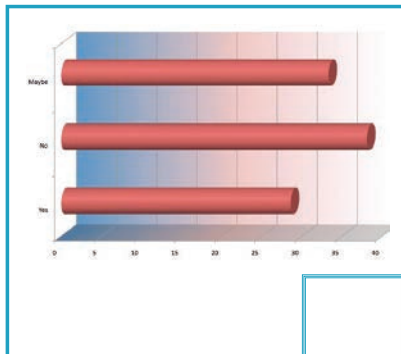


- linear patterns
- tables
- sequences
- graphs
- ordered pairs
- quadrilateral
- rectangular
- prism

Sight Words Activity Page



Write the numbers on their correct vocabulary graphics.



1. linear patterns
2. tables
3. sequences
4. graphs
5. ordered pairs
6. quadrilateral
7. rectangular prism

Sight Words Activity Page



Highlight or circle the words in this word find.

quadrilateral
graphs
sequences

ordered pairs
linear patterns
tables

rectangular prism

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

Sight Words Activity Page



ANSWER KEY

quadrilateral
graphs
sequences

ordered pairs
linear patterns
tables

rectangular prism

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



STUDENT SUPPORT MATERIALS

Reading • Encoding

Encoding Activity Page

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



linear p_____rns

t_____s

s_____nces

gr_____s

o_____d pairs

eque

rdere

able

tangu

aph



Encoding Activity Page



qu_____lateral

rec_____lar prism

atte	adri
------	------

Encoding Activity Page



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

lin

bles

ta

airs

se

ear patterns

gr

angular prism

ordered p

aphs



Encoding Activity Page



quad

rilateral

rect

quences

Encoding Activity Page



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

ar || li || ne

terns || pat

les || tab

Encoding Activity Page



quen se ces

graphs

pairs dered or

Encoding Activity Page



ri

la

ral

te

quad

tan

rec

lar

gu



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 Linear patterns include a list of numbers that increases or decreases by _____ amount between each number.
 - The same
 - A different
 - A larger
 - A smaller

- ② A set of data arranged in rows and columns is a _____.
 - Table
 - Chair
 - List
 - Hard Drive

- ③ A _____ of events lead to the passage of the Alaska Native Claims Settlement Act (ANCSA).
 - Failure
 - Sequence
 - List
 - Plot

- ④ Data on an increase in bear attacks on humans over time may be best represented using:
 - Graphs
 - Traps
 - Bear Spray
 - Dictionaries

- ⑤ Coordinates on a GPS unit are listed as:
 - Cartoons
 - Stick Figures
 - Single Digit Numbers
 - Ordered Pairs

What's the Answer?



- ⑥ A quadrilateral is a polygon with four sides and four:
- Wheelers
 - Line Breaks
 - Vertices
 - Linkages
- ⑦ A _____ prism has a bottom and top that are congruent rectangles.
- Triangular
 - Rectangular
 - Square
 - Circular

What's the Answer?



ANSWER KEY

- ① Linear patterns include a list of numbers that increases or decreases by _____ amount between each number.
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 - a smaller
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Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.



- | | |
|---|--|
| ① Linear patterns are derived from a list of numbers that increase or | ① decrease by the same amount between each number. |
| ② Tables are valuable tools for arranging | ② from year to year can be very valuable to resource managers. |
| ③ The sequence of events leading up to a crime | ③ data in rows and columns. |
| ④ Graphs depicting the changes in salmon harvest | ④ is shown as an ordered pair called a coordinate. |
| ⑤ The latitude and longitude of one's location on a GPS | ⑤ both examples of a quadrilateral. |
| ⑥ Squares and rectangles are | ⑥ that are congruent rectangles. |
| ⑦ Rectangular prisms have a top and a bottom | ⑦ can be very important to a jury hearing the case. |

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

Reading Comprehension Activity Page

ANSWER KEY



- | | |
|---|--|
| ① Linear patterns are derived from a list of numbers that increase or | ① decrease by the same amount between each number. |
| ② Tables are valuable tools for arranging | ② from year to year can be very valuable to resource managers. |
| ③ The sequence of events leading up to a crime | ③ data in rows and columns. |
| ④ Graphs depicting the changes in salmon harvest | ④ is shown as an ordered pair called a coordinate. |
| ⑤ The latitude and longitude of one's location on a GPS | ⑤ both examples of a quadrilateral. |
| ⑥ Squares and rectangles are | ⑥ that are congruent rectangles. |
| ⑦ Rectangular prisms have a top and a bottom | ⑦ can be very important to a jury hearing the case. |

1 → A 2 → C 3 → G 4 → B
5 → D 6 → E 7 → F

Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.



Order of events

Increasing or decreasing by same amount

Diagrams

Give location of a point on a plane

Polygon with 4 sides and 4 vertices

Congruent rectangles on top and bottom

Data arranged in rows and columns

linear patterns **tables** **sequences** **graphs**
ordered pairs **quadrilateral** **rectangular prism**



Reading Comprehension Activity Page

ANSWER KEY



Order of events

sequences

Increasing or decreasing by same amount

linear patterns

Diagrams

graphs

Give location of a point on a plane

ordered pairs

Polygon with 4 sides and 4 vertices

quadrilateral

Congruent rectangles on top and bottom

rectangular prism

Data arranged in rows and columns

tables

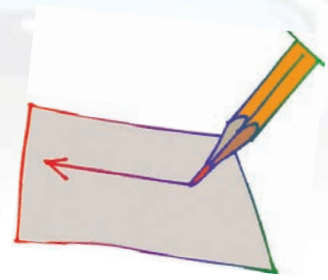


STUDENT SUPPORT MATERIALS

Writing

Writing Activity Page

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



li _____ r pat _____ s

ta _____ s

seq _____ ces

gr _____ hs

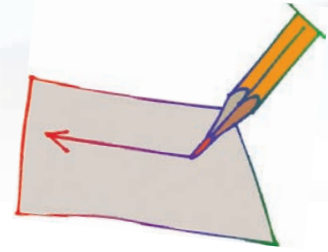
or _____ ed pa _____ s

quad _____ ateral

rec _____ ular p _____ m

Writing Activity Page

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



l _____ **p** _____ **s**

t _____ **s**

s _____ **s**

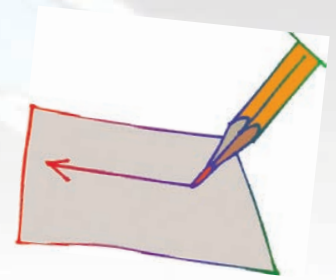
g _____ **s**

o _____ **p** _____ **s**

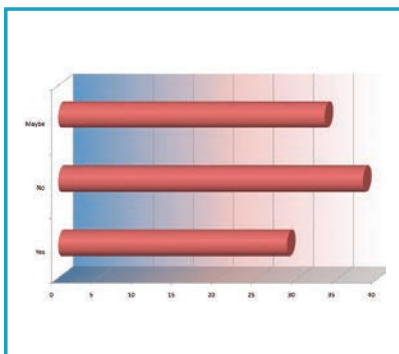
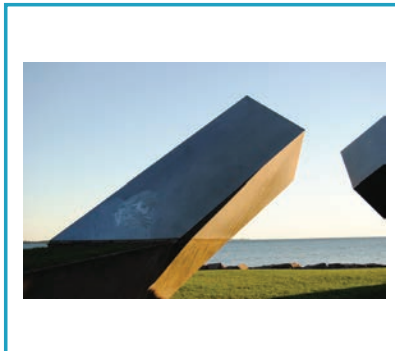
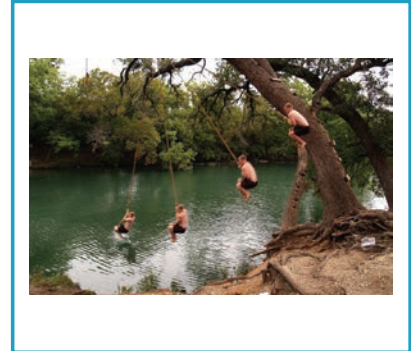
q _____ **l**

r _____ **p** _____ **m**

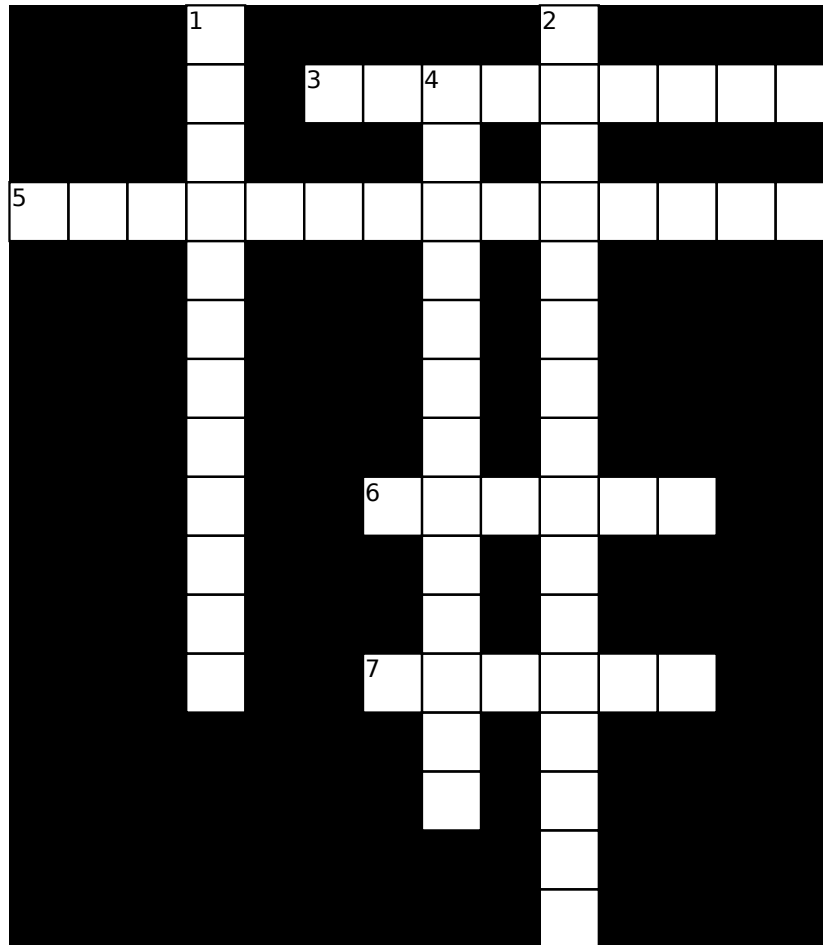
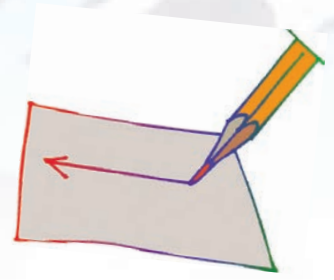
Basic Writing Activity Page



Have the students write the word for each picture.



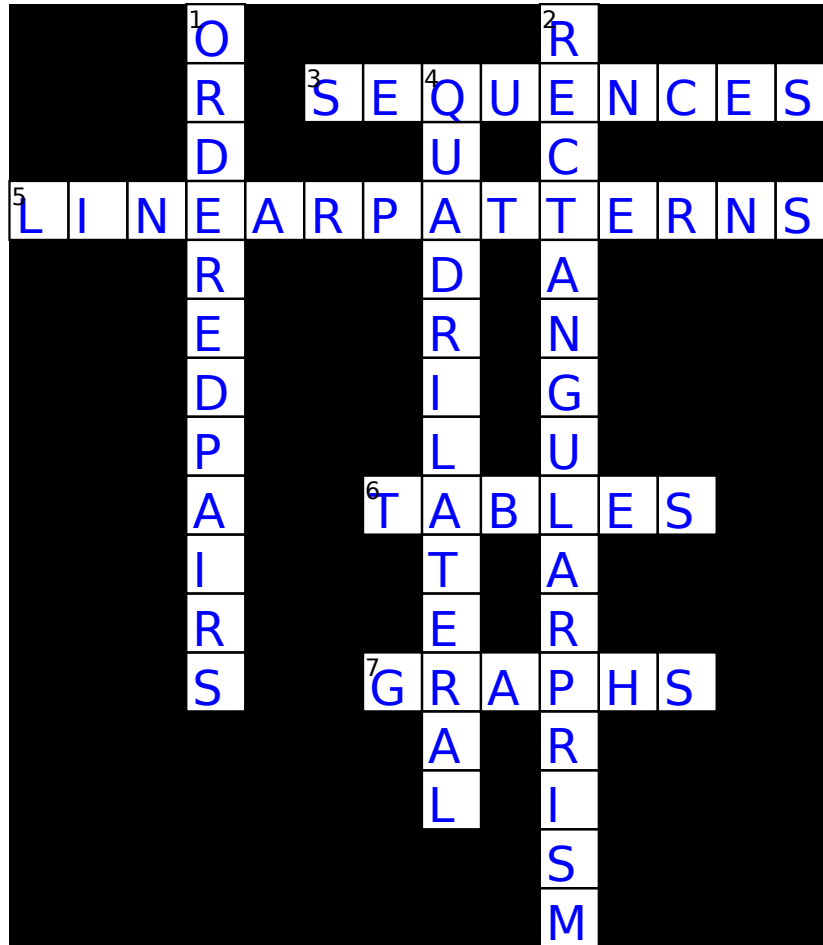
Crossword Puzzle



- Across
- 3 Order of events
 - 5 Increasing or decreasing by same amount (2 Words)
 - 6 Data arranged in rows and columns
 - 7 Diagrams

- Down
- 1 Give location of a point on a plane (2 Words)
 - 2 Congruent rectangles on top and bottom (2 Words)
 - 4 Polygon with 4 sides and 4 vertices

Crossword Puzzle Answers



- | | |
|---|--|
| <p>3 Across
Order of events</p> <p>5 Increasing or decreasing by same amount (2 Words)</p> <p>6 Data arranged in rows and columns</p> <p>7 Diagrams</p> | <p>1 Down
Give location of a point on a plane (2 Words)</p> <p>2 Congruent rectangles on top and bottom (2 Words)</p> <p>4 Polygon with 4 sides and 4 vertices</p> |
|---|--|



UNIT ASSESSMENT



Describing Patterns & Functions

Unit Assessment Teacher's Notes

Grade 8 • Unit 5

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 **LINEAR PATTERNS**.
2. Write the number 2 by the picture for **TABLES**.
3. Write the number 3 by the picture for **SEQUENCES**.
4. Write the number 4 by the picture for **GRAPHS**.
5. Write the number 5 by the picture for **ORDERED PAIRS**.
6. Write the number 6 by the picture for **QUADRILATERAL**.
7. Write the number 7 by the picture for **RECTANGULAR PRISM**.

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.



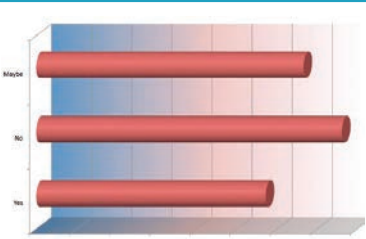


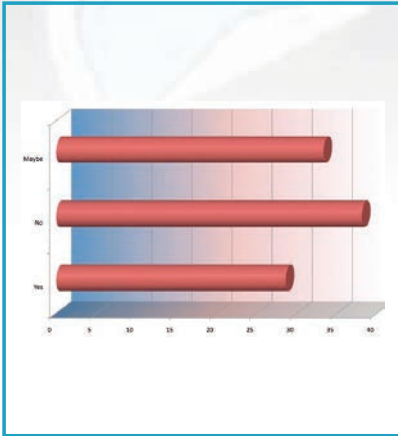
MATH PROGRAM

Unit Assessment Student Pages
Grade 8 • Unit 5

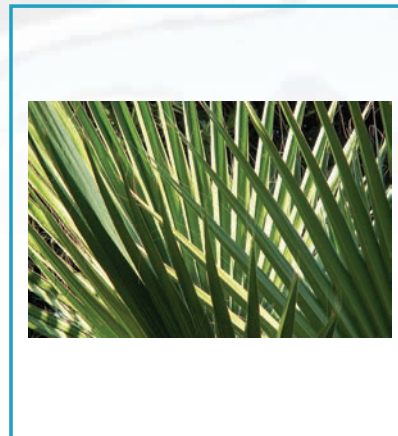
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Number Correct: _____ Percent Correct: _____





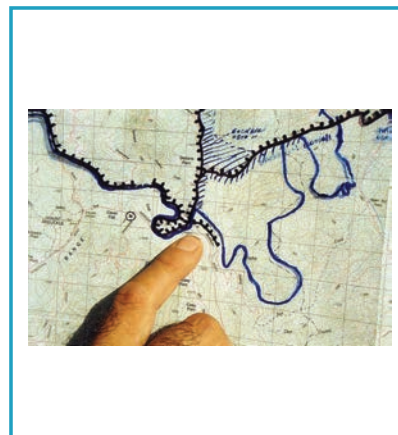
linear patterns
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linear patterns
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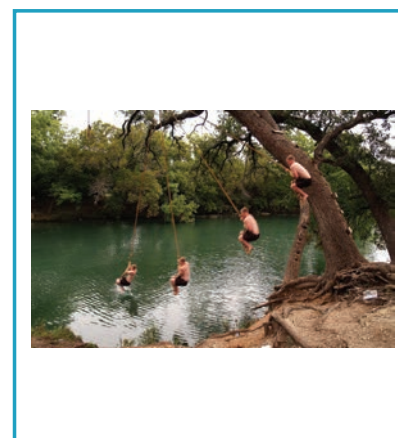
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Order of events

**Increasing or
decreasing by same
amount**

Diagrams

**Give location of a
point on a plane**

**Polygon with 4 sides
and 4 vertices**

**Congruent
rectangles on top
and bottom**

**Data arranged in
rows and columns**

linear patterns

tables

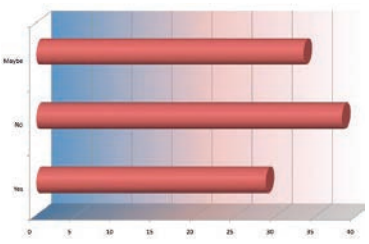
sequences

graphs

ordered pairs

quadrilateral

rectangular prism



31 28,086	32 Ge 72,61	33 As 74,922	34 Se 78,96	35 Br 79,904
50 Sn 118,710	51 Sb 121,760	52 Te 127,60	53 I 126,905	