



UNIT 10: Geometry

Position, Direction & Construction

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.

position

Toss a tennis ball into the center of the room and let it come to a stop on the floor. Ask the students to describe its position in the room. Write the characteristics of its position on the board. You may wish to use a measuring tape!

direction

With the students seated, ask them to quickly point in the direction that a place is located when you call it out. Examples that you may wish to use are Juneau, Anchorage, Fairbanks, Barrow, Ketchikan and Sitka!

diameter

Show the students a clock and explain to them the definition of diameter. Ask them to write several times when the clock's hands would create a chord that corresponds to the diameter of the circle.

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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polygon

Show the students a soccer ball and explain that each of the divisions is a unique polygon. Have the students all guess how many polygons are on the ball. Who came the closest to being correct?

perpendicular line

Explain the definition of perpendicular lines and have the students count the number that they can find on the palms of their own hands. Are there too many to count? Who knew?!

parallel line

Parallel lines are abundant in many transportation systems. Just look at roads, train tracks and the impressions left behind from cross-country skies! What other transportation examples can students come up with?

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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**perpendicular
bisector**

Pass out several blades of grass or small sticks to each student. Explain the definition of a perpendicular bisector and have them use a ruler to create one in exactly the right spot on these items.



VOCABULARY PICTURES





POSITION





DIRECTION





DIAMETER





POLYGON





PERPENDICULAR LINE





PARALLEL LINE





PERPENDICULAR BISECTOR



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.



Whisper

Mount the vocabulary illustrations on the chalkboard. Group the students into two teams. Whisper a vocabulary word to the first player in each team. When you say “Go,” the first player in each team must then whisper the same word to the next player in his/her team. The players should continue whispering the vocabulary word in this way until the last player in a team hears the word. When the last player in a team hears the word, he/she must rush to the chalkboard and point to the illustration for the word. The first player to do this correctly wins the round. Repeat until all players have had an opportunity to identify a vocabulary illustration in this way. When a player has identified a vocabulary illustration, he/she should rejoin the front of his/her team.

Modification: Make it more like tele-pictionary: Whisper a definition to a player, who then must decide what word it is, and whisper the word to the next player, who then translates it into the definition again when they whisper it to the next player. Thus, it would be repeated as word, then definition, then word, then definition, and so forth.

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



Sheet Golf

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

Picture Jigsaw

Cut each of the vocabulary pictures into four pieces. Mix the cut out pieces together and distribute them to the students (a student may have more than one picture section). When you say “Go,” the students should attempt to match the jigsaw sections they have to reproduce the original vocabulary pictures. When the students put the necessary pieces of a picture together, they should identify the picture by its vocabulary word. Continue until all vocabulary pictures have been put together and named in this way.

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.



Balloon Volleyball

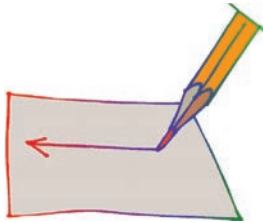
Group the students into two teams. The two teams should stand, facing one another. Toss a round, inflated balloon to the members of Team One. The members of Team One must then bounce the balloon to the members of Team Two. The players should continue to bounce the balloon back and forth in this way until 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 ask all the members in that team to say the vocabulary word for it. Repeat until both teams have responded 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

WRITING



Every Second Letter

Write a sight word on the board, omitting every second letter. Provide the students with writing paper and pens. The students should look at the incomplete word on the board and then write the sight word for it on their papers. Repeat using other sight words.

This activity may also be done in team form. In this case, have the incomplete words prepared on separate flash cards. Mount one of the cards on the board. When you say “Go,” the first player from each team must rush to the board and write the sight word for it—adding all of the missing letters. Repeat until all players have participated.

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 from this unit. Afterward, review their work.

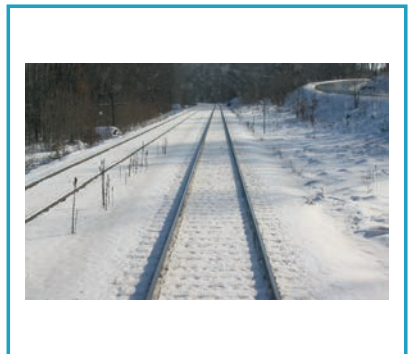


STUDENT SUPPORT MATERIALS

Listening • Mini Pictures

Listening: Mini Pictures

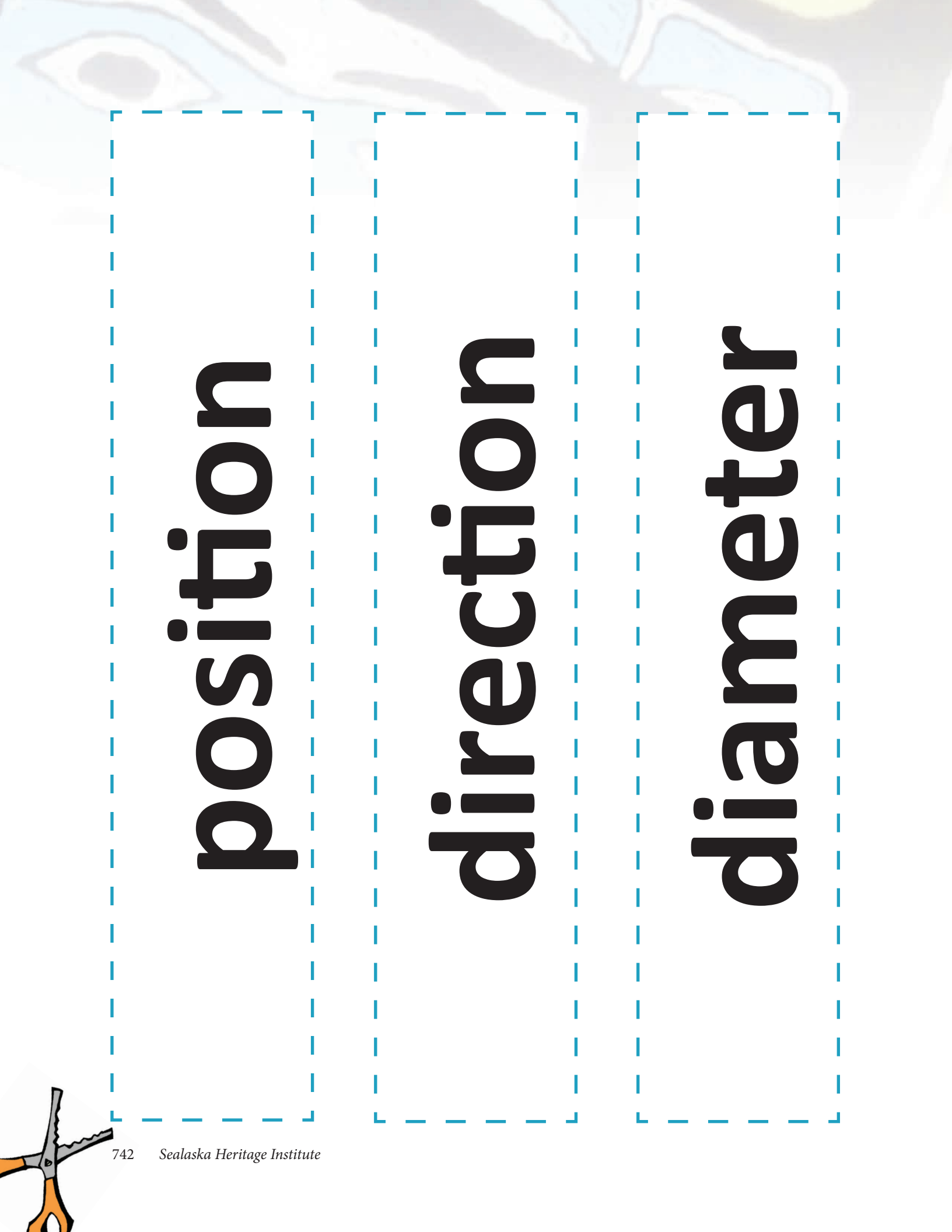
Have the students cut out the pictures. Say the key math words from this unit, and the students should hold up the pictures for them.





STUDENT SUPPORT MATERIALS

Sight Words



position

direction

diameter





polygon

perpendicular line

parallel line



perpendicular bisector



STUDENT SUPPORT MATERIALS

Reading • Sight Recognition

Sight Words Activity Page



Have the students circle the word for each picture.



- position
- direction
- diameter
- polygon
- perpendicular line
- parallel line
- perpendicular bisector



- position
- direction
- diameter
- polygon
- perpendicular line
- parallel line
- perpendicular bisector



- position
- direction
- diameter
- polygon
- perpendicular line
- parallel line
- perpendicular bisector



- position
- direction
- diameter
- polygon
- perpendicular line
- parallel line
- perpendicular bisector



- position
- direction
- diameter
- polygon
- perpendicular line
- parallel line
- perpendicular bisector



- position
- direction
- diameter
- polygon
- perpendicular line
- parallel line
- perpendicular bisector

Sight Words Activity Page

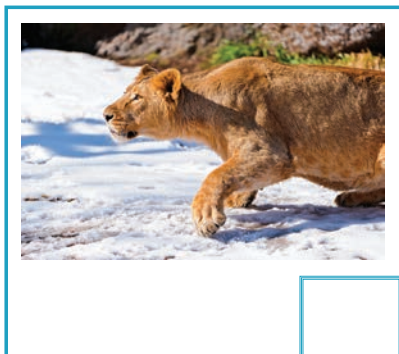


- position**
- direction**
- diameter**
- polygon**
- perpendicular
line**
- parallel line**
- perpendicular
bisector**

Sight Words Activity Page



Write the numbers on their correct vocabulary graphics.



1. position
2. direction
3. diameter
4. polygon
5. perpendicular line
6. parallel line
7. perpendicular bisector

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.

direction
perpendicular bisector
polygon
diameter

position
perpendicular line
parallel line

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

Sight Words Activity Page

ANSWER KEY



direction
perpendicular bisector
polygon
diameter

position
perpendicular line
parallel line

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



STUDENT SUPPORT MATERIALS

Reading • Encoding

Encoding Activity Page

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



p_____ion

di_____ion

d_____ter

p_____on

perp_____ular line

rect	endic	secto
------	-------	-------

rall	osit
------	------



Encoding Activity Page



pa_____el line

perpendicular bi_____r

olyg	iame
------	------

Encoding Activity Page



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

pos

ine

di

sector

dia

ition

pol

rection

per

ygon



Encoding Activity Page



parallel l

pendicular line

**perpendicular
bi**

meter

Encoding Activity Page



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

tion || si || po

rec || di || tion

me || di || a || ter

Encoding Activity Page



y || pol || gon

pen || per || lar || di || cu

line

Encoding Activity Page



ral || line || pa || lel

lar || di || per || pen || cu

bi || tor || sec



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 The position of Fairbanks relative to Southeast Alaska is
 - Large
 - North
 - Small
 - South

- ② The direction that salmon swim in a river to spawn is generally
 - Upstream
 - Downstream
 - Upside Down
 - Out to Sea

- ③ The diameter of a pearl would be the measure of a chord passing through its
 - Top
 - Bottom
 - Left Side
 - Center

- ④ A polygon is a _____ figure made up of line segments.
 - Open
 - Closed
 - Heavy
 - Light

- ⑤ Perpendicular lines are lines that intersect to form _____ angles.
 - Small
 - Large
 - Left
 - Right

What's the Answer?



- ⑥ Good examples of parallel lines are
- Train Tracks
 - Basketballs
 - Fish Eggs
 - Car Tires
- ⑦ A perpendicular bisector passes through the _____ of a line.
- Far Ends
 - Left End
 - Right End
 - Mid-Point

What's the Answer?



ANSWER KEY

- ① The position of Fairbanks relative to Southeast Alaska is
 - Large
 - North
 - Small
 - South

- ② The direction that salmon swim in a river to spawn is generally
 - Upstream
 - Downstream
 - Upside Down
 - Out to Sea

- ③ The diameter of a pearl would be the measure of a chord passing through its
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 - Bottom
 - Left Side
 - Center

- ④ A polygon is a _____ figure made up of line segments.
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 - Closed
 - Heavy
 - Light

- ⑤ Perpendicular lines are lines that intersect to form _____ angles.
 - Small
 - Large
 - Left
 - Right

What's the Answer?



- ⑥ Good examples of parallel lines are
- Train Tracks
 - Basketballs
 - Fish Eggs
 - Car Tires
- ⑦ A perpendicular bisector passes through the _____ of a line.
- Far Ends
 - Left End
 - Right End
 - Mid-Point

Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.



- | | |
|--|---|
| ① The position of an army on the battlefield | ⑨ diameter of a mature cottonwood tree. |
| ② The direction that one is driving is important | ⑩ closed figure made up of line segments. |
| ③ The diameter of an acorn is much less than the | ⑪ parallel lines. |
| ④ A polygon is a | ⑫ perpendicular line. |
| ⑤ A cross is an example of a | ⑬ perpendicular bisector. |
| ⑥ Train tracks are examples of | ⑭ can be important for winning the battle or war. |
| ⑦ A plus sign is an example of a | ⑮ if you wish to reach your intended destination! |

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

Reading Comprehension Activity Page

ANSWER KEY



- | | |
|--|---|
| ① The position of an army on the battlefield | ⑨ diameter of a mature cottonwood tree. |
| ② The direction that one is driving is important | ⑩ closed figure made up of line segments. |
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| ⑤ A cross is an example of a | ⑬ perpendicular bisector. |
| ⑥ Train tracks are examples of | ⑭ can be important for winning the battle or war. |
| ⑦ A plus sign is an example of a | ⑮ if you wish to reach your intended destination! |

1→ F 2→ G 3→ A 4→ B
5→ D 6→ C 7→ E

Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.



Closed figure of line segments

Intersect to form right angles

Location

Chord passing through circle center

In same plane without intersection

Line along which something faces

Intersecting at a mid-point

position	direction	diameter	polygon
perpendicular line	parallel line	perpendicular bisector	



Reading Comprehension Activity Page

ANSWER KEY



Closed figure of line segments

polygon

Intersect to form right angles

perpendicular line

Location

position

Chord passing through circle center

diameter

In same plane without intersection

parallel line

Line along which something faces

direction

Intersecting at a mid-point

perpendicular bisector

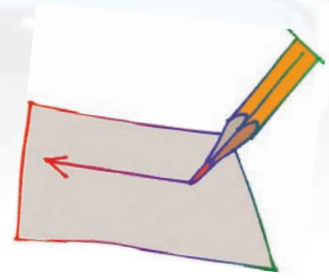


STUDENT SUPPORT MATERIALS

Writing

Writing Activity Page

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



po_____ion

dir_____tion

diam_____r

po_____gon

per_____dic_____ar l_____e

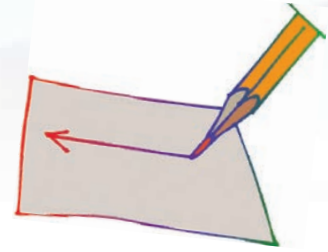
para_____l li_____

p_____pen_____ular

bi_____tor

Writing Activity Page

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



p _____ **n**

d _____ **n**

d _____ **r**

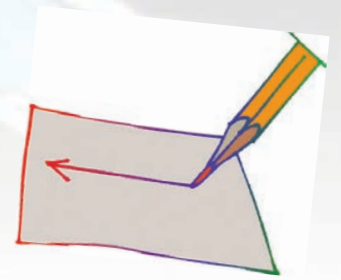
p _____ **g** _____ **n**

p _____ **l** _____ **e**

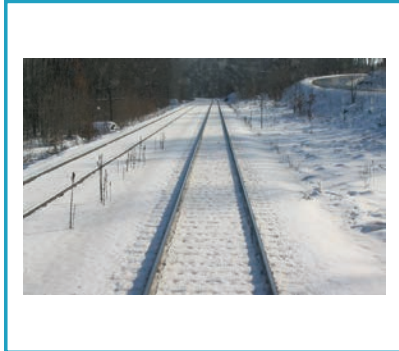
p _____ **l** _____ **l** _____ **e**

p _____ **b** _____ **r**

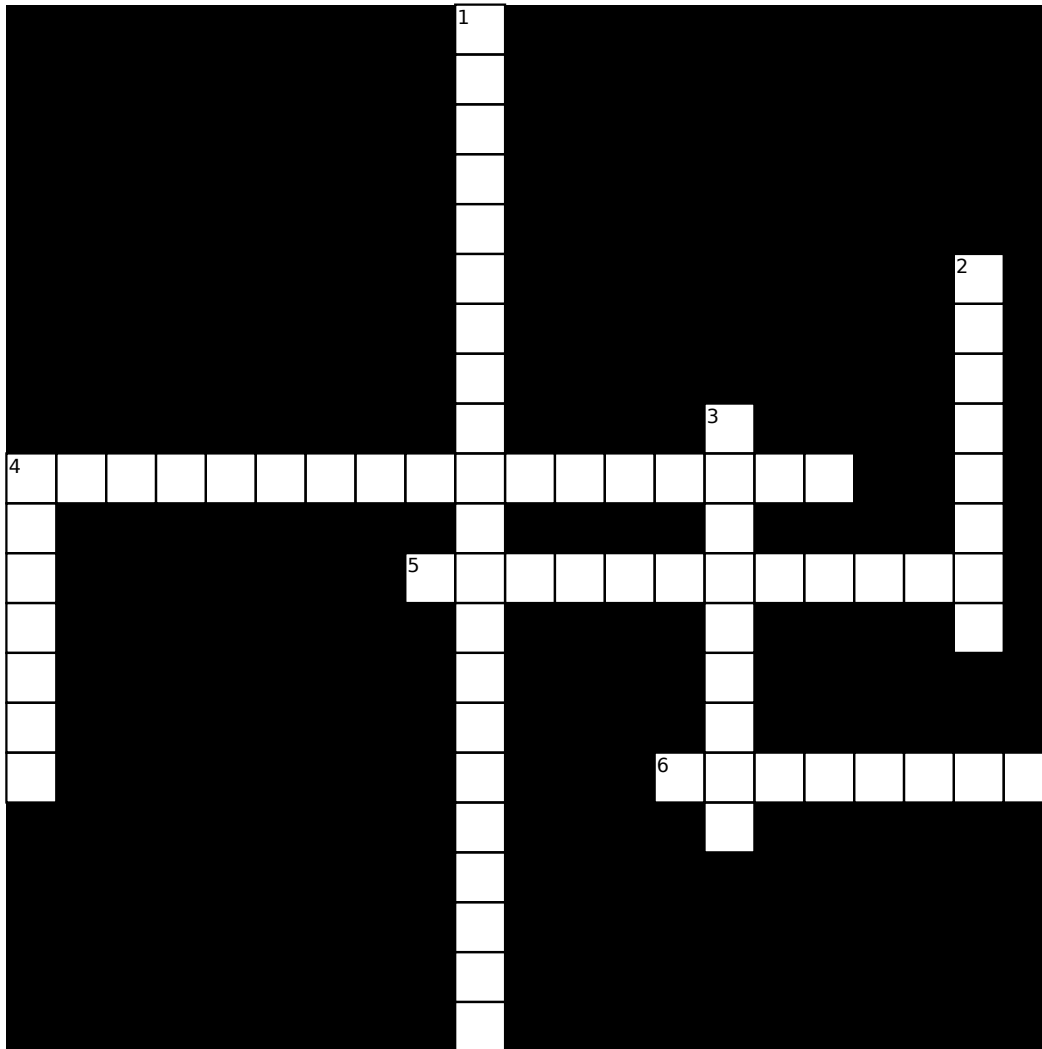
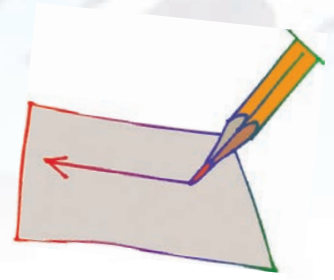
Basic Writing Activity Page



Have the students write the word for each picture.



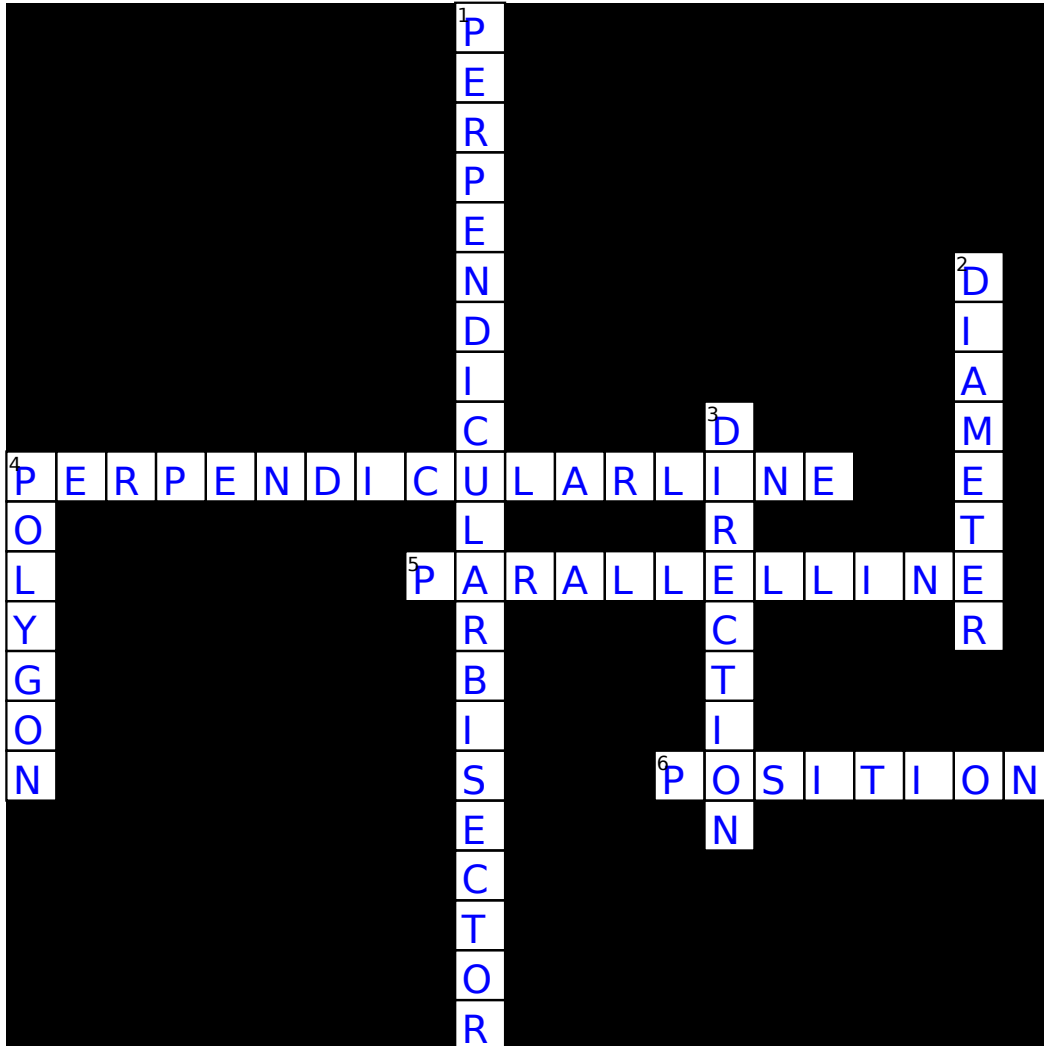
Crossword Puzzle



- Across
- 4 Intersect to form right angles (2 Words)
 - 5 In same plane without intersection (2 Words)
 - 6 Location

- Down
- 1 Intersecting at a mid-point (2 Words)
 - 2 Chord passing through circle center
 - 3 Line along which something faces
 - 4 Closed figure of line segments

Crossword Puzzle Answers



- Across
- 4 Intersect to form right angles (2 Words)
 - 5 In same plane without intersection (2 Words)
 - 6 Location

- Down
- 1 Intersecting at a mid-point (2 Words)
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UNIT ASSESSMENT



Position, Direction & Construction

Unit Assessment Teacher's Notes

Grade 8 • Unit 10

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 **POSITION**.
2. Write the number 2 by the picture for **DIRECTION**.
3. Write the number 3 by the picture for **DIAMETER**.
4. Write the number 4 by the picture for **POLYGON**.
5. Write the number 5 by the picture for **PERPENDICULAR LINE**.
6. Write the number 6 by the picture for **PARALLEL LINE**.
7. Write the number 7 by the picture for **PERPENDICULAR BISECTOR**.

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.



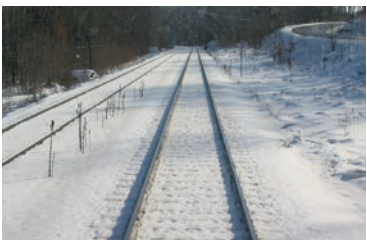


MATH PROGRAM

Unit Assessment Student Pages
Grade 8 • Unit 10

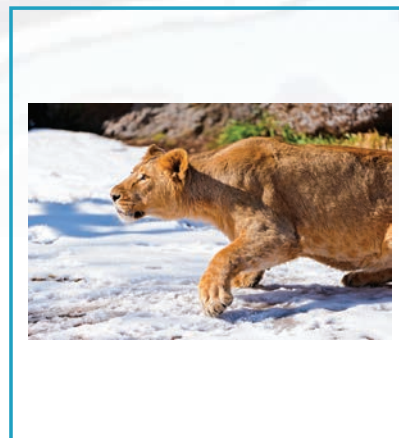
Date: _____ Student's Name: _____

Number Correct: _____ Percent Correct: _____





position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector



position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector



position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector



position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector



position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector



position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector



position
direction
diameter
polygon
perpendicular line
parallel line
perpendicular
bisector

posi_____

chin
chen
chan
chon
chun
tian
tien
tion
tiun

direc_____

chin
chen
chan
chon
chun
tian
tien
tion
tiun

diam_____

atar
etar
itar
otar
utar
ater
eter
iter
oter

pol_____

igan
igen
igin
igon
igun
ygan
ygen
ygin
ygon

perpendic_____ **line**

alar
elar
ilar
olar
ular
aler
eler
iler
oler

para_____ **line**

lal
lel
lil
lol
lul
llal
llef
llil
llol

perpendicular
bise_____

ktar
kter
ktir
ktor
ktur
ctar
cter
ctir
ctor



Closed figure of line segments

Intersect to form right angles

Location

Chord passing through circle center

In same plane without intersection

Line along which something faces

Intersecting at a mid-point

position

direction

diameter

polygon

perpendicular line

parallel line

perpendicular bisector

