UNIT 6
Geometry
Alaskan Math Standards (GLE’s) for This Unit

These Alaskan math standards underly the language development of the unit. Many of these standards are addressed during the regular math program and in the concrete introduction of the key vocabulary words for the unit.

The student demonstrates an understanding of geometric relationships by

[7] G-1 using the attributes and properties of polygons (diagonals, number of sides and angles) to identify and classify regular or irregular polygons (M5.3.1)

[7] G-2 using the attributes and properties of prisms (vertices, length and alignment of edges, shape and number of bases, shape of faces) to identify and describe triangular or rectangular pyramids (M5.3.2)

The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by

[7] G-3 using a scale factor to solve problems involving similar shapes (e.g., scale drawings, maps) (M5.3.3)

[7] G-4 drawing or describing the results of applying transformations such as translations, rotations, reflections, or dilations to figures (L) (M5.3.5)

The student solves problems (including real-world situations) by

[7] G-5 determining the volume of cubes and rectangular prisms (M5.3.4)

[7] G-6 determining the surface area of rectangular prisms (M5.3.4)

[7] G-7 determining the circumference of a circle (M5.3.4)
Alaskan Language Standards (GLE’s) for This Unit

AK.R.3.1. Reading: The student uses strategies to decode or comprehend the meaning of words in texts. (E.B.1)

[7] 3.2.2. Reading aloud short factual information (e.g., reports, articles) (L)

AK.R.3.3. Reading: The student restates/summarizes and connects information. (E.B.3)

AK.R.3.5. Reading: The student follows written directions. (E.C.2)

[7] 3.5.1. Completing a task by following written, multi-step directions (e.g., answer a multi-faceted text question) (L)

[7] 3.5.2. Identifying the sequence of steps in a list of directions (e.g., what is the first step, what is the second step)

[7] 3.3.4. Applying rules of capitalization (e.g., titles and proper nouns)

AK.W.3.4. Writing: The student revises writing. (E.A.5, E.A.8)

AK.E.A. A student should be able to speak and write well for a variety of purposes and audiences. A student who meets the content standard should:

E.A.1. Apply elements of effective writing and speaking. These elements include ideas, organization, vocabulary, sentence structure, and personal style.

E.A.2. In writing, demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation.

E.A.3. In speaking, demonstrate skills in volume, intonation, and clarity.
INTRODUCTION OF MATH VOCABULARY
Geometry

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.

Before the lesson begins, prepare a number of regular and irregular polygons, using paper. Mix all of the polygons together. Introduce the features of regular and irregular polygons.

Have the students sort and classify the polygons according to regular and irregular.

**POLYGON**

Before the lesson begins, nail six or more small nails into a portion of wood. Use an elastic band to create different shapes on the nails. Have individual students create shapes using the elastic. Use this to introduce polygons to the students.

**POLYHEDRON**

Cut the shape of a pyramid from cardboard. Ask the students watch as you assemble the triangle. Direct their attention to the number of faces on the triangle. Show the pyramid picture from the back of this unit. Use it and your model to introduce polyhedron to the students.

**REGULAR (POLYGON)**

Before the lesson begins, prepare a number of regular and irregular polygons, using paper. Mix all of the polygons together. Introduce the features of regular and irregular polygons.

Have the students sort and classify the polygons according to regular and irregular.
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.

**REGULAR**
(POLYGON)

Before the lesson begins, prepare a number of regular and irregular polygons, using paper. Mix all of the polygons together. Introduce the features of regular and irregular polygons.

Have the students sort and classify the polygons according to regular and irregular.

**DIAGONAL**

Use masking tape to make a square on the floor. Use string or yarn to show a diagonal line. Draw an intersection on the board. Use it to show how pedestrians may cross the intersection diagonally.

**CONGRUENT**

Before the lesson begins, collect pairs of identical items (i.e. cans of food, coins, containers, etc.). Mix all of the items together and have the students sort and match the different pairs. Use the pairs of items to introduce congruent shapes to the students.
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.

RADIUS

Make a large masking tape circle on the floor. Group the students around the circle; and place a flashlight in the center of the circle. Dim the lights and turn on the flashlight. Direct the students’ attention to the light from the center of the circle to the masking tape. Introduce this as the radius of the circle.

DIAMETER

Place another flashlight in the center of the masking tape circle, from exercise above. Place the flashlight so that the light shines in the opposite direction from the first flashlight. Use the bar of light to introduce diameter to the students.

CIRCUMFERENCE

Direct the students’ attention to the masking tape circle, used above; and use it to introduce circumference. Demonstrate the use of pi to determine a circle's circumference: \( \pi \times \text{radius} \). Give the students circles of different sizes. Have them determine the circumferences of the circles.
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.

Show the students a pizza or a cut-out of a pizza. As they watch, cut one quarter of the pizza off. Use this to introduce quadrant as it relates to a circle.
POLYGON
POLYHEDRON
REGULAR
(POLYGON)
IRREGULAR
(POLYGON)
DIAGONAL
CONGRUENT
RADIUS
Circumference

Segment

Chord

Radius

Sector

Arc

Diameter

Tangent
DIAMETER
CIRCUMFERENCE
QUADRANT
LANGUAGE ACTIVITIES
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.

Mini Pictures
Provide each student with a copy of the mini-pictures page from the Student Support Materials. When you say the key words, the students must find the pictures for them. Then, have the students cut out the pictures. Say the keywords and the students should hold up the pictures for them.

Stretch
Place the vocabulary pictures on the floor, in a scattered form. The pictures should be quite close together. Have a student stand beside the pictures. Say a vocabulary word for one of the pictures. The student should place his/her left foot on that picture. Then, say other vocabulary words and the student must identify the correct pictures with different parts of his/her body. You may wish to have two students participate in this process at the same time for added motivation.

Half Match
Collect the picture halves from the previous activity. Mix all of the halves together and give them to the students. Say a sentence, leaving out the key word. The two students who have the illustration halves for the word that completes the sentence should show their halves. Continue in this way until all of the illustration halves have been presented.

Searchlight
Have two students stand, facing one another. Mount the vocabulary graphics on the board and number them. The object of the activity is for the two students to look at each other without laughing. The first student to laugh must then identify a vocabulary picture by a number from the board. If both students laugh, then both students must identify a vocabulary picture for the numbers you say from the board. Repeat with other pairs of students.
**Three Sentences**
Provide each student with three blank flashcards. Each student should then write the numbers 1 to 3 on his/her cards (one number per card). Say three sentences, only one of which contains a vocabulary word. The students should listen carefully to the three sentences that you say. After saying the three sentences, each student should then show his/her number card that represents the number of the sentence which contained the vocabulary word. Repeat with other sets of sentences.

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

SPEAKING

Visual Memory
Mount the vocabulary pictures on the board. The students should look carefully at the pictures. Then, ask the students to close their eyes. Remove one of the pictures from the board and place it to the side. The students should then open their eyes and identify the “missing picture.” Continue in this way until all of the pictures have been removed. This activity can also be done in reverse. In this way, prepare two or three extra sets of vocabulary pictures. Mount a number of pictures on the board. The students should look carefully at the pictures. Then, have the students close their eyes. Add another picture to the board. The students should open their eyes and identify the “new picture.” This activity (and the previous form of the activity) may be done in team form. In this case, the first player to identify the new or missing picture wins the round.

Number What?
Mount the vocabulary graphics on the chalkboard. Number each graphic. Call one of the numbers and the students should identify the graphic that is labeled with that number. Continue in this way until all of the vocabulary graphics have been identified a number of times. To add “spice” to the activity, you may wish to say a simple oral math problem, the answer to which is equal to one of the numbers on the chalkboard. (For example, you could say, “Six plus four, minus three, plus one.” The answer would be “Eight.” In this case, the students should identify the vocabulary graphic with the numeral “8” beside it.) This activity may also be done in team form. The first player to solve the math problem and then to identify the graphic that is labeled with the number answer to the math problem, wins the round.

Hand Tag
Group the students in a circle on the floor. Have the students place their hands on the floor, palms down. Stand in the center of the circle with the vocabulary picture and a flashlight. The object of the activity is to attempt to tag a student’s hand or hands with the light of the flashlight. The students must pull their hands from the circle when they think they are about to be tagged. When you eventually tag a student’s hand or hands, he/she must then say a complete sentence using the word for a vocabulary picture that you show. Repeat this process until many students have responded.
Half Match
Before the lesson begins, prepare a photocopy of each of the vocabulary pictures. Cut each of the photocopied pictures in half. Give the picture halves to the students (a student may have more than one picture half). Say one of the vocabulary words. The two students who have the halves of the picture for that word must show their halves and repeat the word orally. Continue in this way until all of the vocabulary words have been reviewed. This activity may be repeated more than once by collecting, mixing, and redistributing the picture halves to the students. This activity may also be adapted for team form. To do this, cut each of the vocabulary pictures in half. Place half of the pictures in one pile and the other halves in another pile (one pile for each team). Say a vocabulary word. When you say “Go,” the first player from each team must rush to his/her pile of picture halves. Each player must find the half of the picture for the vocabulary word you said. The first player to correctly identify the picture half and to repeat the vocabulary word for it wins the round. Repeat until all players have played.

Picture Outline
Mount the vocabulary pictures on the board. Draw a chalk outline around the sides of each picture. Review the pictures with the students. When an outline has been created for each picture, remove the pictures from the board (being certain to recall their original locations on the board). Number each of the outlines and call upon a student to recall the vocabulary word for the picture that goes with that outline. Repeat this process until all of the vocabulary words have been said by the students 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.

Sight Recognition

Right or Wrong?
Mount the sight words on the board. Point to one of the sight words and name it. The students should repeat the sight word. However, when you point to a sight word and say the wrong word for it, the students should remain silent. Repeat this process until the students have responded accurately to all of the sight words a number of times.

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.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Decoding/Encoding

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.
**Sensory Letters**
Stand behind a student. Use the index finger of your writing hand to “write” a letter/syllable from a sight word on the student’s back. The student should feel the letter/syllable. Then, the student must name a sight word that contains that letter/syllable. This activity may also be done in team form. In this case, group the students into two teams. “Write” a letter/syllable on the backs of the last players in each team. When you say, “Go,” the last player in each team must repeat this process with the player in front of him/her. The players should continue in this way until the first player in the team feels the letter/syllable. That player must then identify a sight word that contains that letter/syllable. The first player to do this successfully wins the round. Repeat until all players have played.

**Student Support Materials**
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

**Reading Comprehension**

**Student Support Materials**
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.
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.

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.

What’s Your Letter?
Provide each student with writing paper and a pen. Say a sight word. Each student should then write ONE letter from that word (any letter) on their paper. Review the students’ responses to determine if all letters from the sight word were used. If all letters from the sight word were not used, ask the students to identify the letters that are “missing.” Repeat with other sight words.

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.
Dash
Group the students into two teams. Make two sets of dashes on the board — each set should be the same and should represent the number of letters in a sight word. When you say “Go,” the first player in each team must rush to his/her set of dashes on the board. Each player must then write a sight word that fits the number of dashes. Accept any sight word that fits the dashes. The first player to do this correctly wins the round. Repeat with other sets of dashes until all students have had an opportunity to participate.

Silent Dictation
Provide each student with writing paper and a pen. The students should watch carefully as you move your lips as though you are saying one of the sight words (do not voice the word). After “lipping” the sight word, each student should write that word on his/her sheet of paper. Repeat this process with other sight words. Afterwards, 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
polygon

polyhedron

regular
irregular

diagonal

congruent
radius

diameter

circumference
quadrant
STUDENT SUPPORT MATERIALS

Reading • Sight Recognition
Sight Words Activity Page

Have the students circle the word for each picture.

polygon
polyhedron
regular
irregular
diagonal
congruent
radius
diameter
circumference
quadrant

polygon
polyhedron
regular
irregular
diagonal
congruent
radius
diameter
circumference
quadrant

polygon
polyhedron
regular
irregular
diagonal
congruent
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polygon
polyhedron
regular
irregular
diagonal
congruent
radius
diameter
circumference
quadrant
Sight Words Activity Page

polygon
polyhedron
regular
irregular
diagonal
congruent
radius
diameter
circumference
quadrant

polygon
polyhedron
regular
irregular
diagonal
congruent
radius
diameter
circumference
quadrant
Sight Words Activity Page

Write the numbers on their correct vocabulary graphics.

1. polygon
2. polyhedron
3. regular
4. irregular
5. diagonal
6. congruent
7. radius
8. diameter
9. circumference
10. quadrant
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.

<table>
<thead>
<tr>
<th>diameter</th>
<th>polyhedron</th>
<th>diagonal</th>
<th>regular</th>
<th>irregular</th>
<th>circumference</th>
<th>congruent</th>
</tr>
</thead>
<tbody>
<tr>
<td>radius</td>
<td>quadrant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{p c o r e a u d i a g o n a l n y e}
\]
\[
\text{g o o u r e i r r e g u l a r g i}
\]
\[
\text{c i r c u m f e r e n c r e i r a y}
\]
\[
\text{n p m e i r r e g u l i t l d a o r o}
\]
\[
\text{i y d l o g e e r a d i u o s r d e}
\]
\[
\text{g r i c e r q u a d r a n t n p n t}
\]
\[
\text{d e h p c o n g r u e n t n e o f r}
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\[
\text{o d i a m e t e r e r n e y n r u c}
\]
\[
\text{o o i u c n r a d i u s r p c c n d}
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\text{o c o l p o l y g o n m e o o s c t}
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\text{r p o l y h e d r o e l d r u l e r}
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\text{r g l r r n p p o l y h e d r o n n}
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\text{a e r u d l d i a m e t e e r r r d}
\]
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\text{l e e u o i e r n r c d i a g o n r}
\]
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\text{m u r d c g p o l y g o o f a u n u}
\]
\[
\text{n r e g u l a r g r l q d l n p u}
\]
\[
\text{u c o n g r u e c e l r u o i r p}
\]
\[
\text{r c i r c u m f e r e n c e r o e o}
\]
\[
\text{u r e g u l a c r q u a d r a i r y}
\]
\[
\text{u r y n a a g r c a a e y e o n r q}
\]
## Sight Words Activity Page

**Answer Key**

<table>
<thead>
<tr>
<th>diameter</th>
<th>polyhedron</th>
<th>diagonal</th>
<th>regular</th>
<th>circumference</th>
<th>congruent</th>
</tr>
</thead>
<tbody>
<tr>
<td>polygon</td>
<td>radius</td>
<td>quadrant</td>
<td>irregular</td>
<td>polygon</td>
<td></td>
</tr>
</tbody>
</table>
STUDENT SUPPORT MATERIALS

Reading  •  Encoding
Encoding Activity Page

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

poly_________________

poly_________________dron

re_________________lar

i__________________regular

di__________________onal

he rr ag
gu ra 546  Sealaska Heritage Institute
Encoding Activity Page

con____________________ent

d____________________meter

circum________________ence

quad____________________

ia             gon             gru

fer             rant
**Encoding Activity Page**

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

<table>
<thead>
<tr>
<th>poly</th>
<th>gruent</th>
</tr>
</thead>
<tbody>
<tr>
<td>polyhe</td>
<td>ular</td>
</tr>
<tr>
<td>reg</td>
<td>onal</td>
</tr>
<tr>
<td>irregu</td>
<td>gon</td>
</tr>
<tr>
<td>diag</td>
<td>dius</td>
</tr>
</tbody>
</table>
Encoding Activity Page

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

ly | dron | po | he

--------  --------  --------  --------

ir | lar | reg | u

--------  --------  --------  --------
Encoding Activity Page

cum    cir    ence    fer

_________    _________    _________

ter    di    me    a

_________    _________    _________
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. A polygon is a
   - function.
   - two dimensional shape.
   - three dimensional shape.
   - diagonal line.

2. A polyhedron is a
   - two dimensional polygon with irregular faces.
   - three dimensional polygon with irregular faces.
   - solid with flat faces that are polygons.
   - congruent shape with no faces.

3. A regular polygon has
   - irregular angles and equal sides.
   - equal angles and irregular sides.
   - has equal angles and equal sides.
   - congruent angles and a variable.

4. An irregular polygon does not have equal angles or sides
   - ever.
   - sometimes.
   - only with prime numbers.
   - always.

5. A diagonal line in a shape runs from
   - a congruent shape to a radius.
   - one corner to another.
   - the circumference to the radius.
   - one side to another.

6. Congruent shapes are
   - composites.
   - irregular.
   - the same.
   - similar.
What's the Answer?

7. The radius of a circle is
   - the length of the diameter.
   - a diagonal line.
   - is congruent.
   - half of its diameter.

8. The diameter is a straight line going through the center of a circle
   - connecting two points on the circumference.
   - connecting an irregular polygon to a radius.
   - connecting the radius to a regular angle.
   - connecting three points near the circumference.

9. The circumference is
   - the diameter of a circle.
   - a radius that touches the edge of a circle.
   - an irregular polygon with equal angles.
   - the distance around the edge of a circle.

10. A quadrant is
    - a quarter of a circle.
    - half the radius of a circle.
    - a half circle.
    - a third of a circle.
1. A polygon is a
   ○ function.
   ○ two dimensional shape.
   ● three dimensional shape.
   ○ diagonal line.

2. A polyhedron is a
   ○ two dimensional polygon with irregular faces.
   ○ three dimensional polygon with irregular faces.
   ○ solid with flat faces that are polygons.
   ● congruent shape with no faces.

3. A regular polygon has
   ● irregular angles and equal sides.
   ○ equal angles and irregular sides.
   ○ has equal angles and equal sides.
   ○ congruent angles and a variable.

4. An irregular polygon does not have equal angles or sides
   ○ ever.
   ○ sometimes.
   ● only with prime numbers.
   ○ always.

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   ○ a congruent shape to a radius.
   ○ one corner to another.
   ● the circumference to the radius.
   ○ one side to another.

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   - connecting two points on the circumference.
   - connecting an irregular polygon to a radius.
   - connecting the radius to a regular angle.
   - connecting three points near the circumference.

9. The circumference is
   - the diameter of a circle.
   - a radius that touches the edge of a circle.
   - an irregular polygon with equal angles.
   - the distance around the edge of a circle.

10. A quadrant is
    - a quarter of a circle.
    - half the radius of a circle.
    - a half circle.
    - a third of a circle.
Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1. A polygon is a plane shape
2. A polyhedron is a solid with flat faces
3. A regular polygon has
4. An irregular polygon has
5. A diagonal line in a shape runs
6. Congruent shapes
7. The radius is
8. The diameter runs through
9. The circumference
10. A quadrant is

A. equal angles and sides.
B. unequal sides and angles.
C. are the same in shape.
D. such as a pyramid.
E. the center of a circle.
F. (two-dimensional) with straight sides, such as triangles, rectangles and pentagons.
G. is the edge of a circle.
H. from one corner to another.
I. a quarter of a circle.
J. half the diameter of a circle.

1→__________ 2→__________ 3→__________ 4→__________
5→__________ 6→__________ 7→__________ 8→__________
9→__________ 10→__________
Reading Comprehension Activity Page

ANSWER KEY

1. A polygon is a plane shape  A. equal angles and sides.
2. A polyhedron is a solid with flat faces  B. unequal sides and angles.
3. A regular polygon has  C. are the same in shape.
4. An irregular polygon has  D. such as a pyramid.
5. A diagonal line in a shape runs  E. the center of a circle.
6. Congruent shapes  F. (two-dimensional) with straight sides, such as triangles, rectangles and pentagons.
7. The radius is  G. is the edge of a circle.
8. The diameter runs through  H. from one corner to another.
9. The circumference  I. a quarter of a circle.
10. A quadrant is  J. half the diameter of a circle.

1→ F  2→ D  3→ A  4→ B
5→ H  6→ C  7→ J  8→ E
9→ G  10→ I
### Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.

<table>
<thead>
<tr>
<th>This is half the diameter of a circle.</th>
<th>This shape has equal sides and angles.</th>
<th>This is a line that runs through the center of a circle.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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560  Sealaska Heritage Institute
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STUDENT SUPPORT MATERIALS

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

po_______gon
poly_____dron
re________lar
_______regular
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Writing Activity Page

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

po______________________________n
p______________________________n
re____________________________r
ir____________________________r
di____________________________l
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Basic Writing Activity Page

Have the students write the word for each picture.
Basic Writing Activity Page

Have the students write the word for each picture.
Crossword Puzzle

ACROSS

2  This is half the diameter of a circle.
9  These are shapes that are the same.
10 This polygon has equal angles and sides.

DOWN

1  This is the edge of a circle.
3  This is a line in a shape that goes from one corner to another.
4  This is a solid shape.
5  This is a line that runs through the center of a circle.
6  This polygon does not have equal angles and sides.
7  This shape has equal sides and angles.
8  This is a quarter of a circle.
Crossword Puzzle Answers

C  R  A  D  I  U  S

R  D  C  P  D

I  U  O  I  I

A  M  L  A

G  F  Y  M  P  R  Q

O  E  H  E  O  E  U

C  O  N  G  R  U  E  N  T  L  G  A

A  E  D  E  Y  U  D

L  N  R  R  E  G  U  L  A  R

C  O  N  O  A  N  T
UNIT ASSESSMENT
Geometry

Unit Assessment Teacher’s Notes
Grade 7  ●  Unit 6

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 POLYGON.
2. Write the number 2 by the picture for POLYHEDRON.
3. Write the number 3 by the picture for REGULAR POLYGON.
4. Write the number 4 by the picture for IRREGULAR POLYGON.
5. Write the number 5 by the picture for DIAGONAL.
6. Write the number 6 by the picture for CONGRUENT
7. Write the number 7 by the picture for RADIUS.
8. Write the number 8 by the picture for DIAMETER.
9. Write the number 9 by the picture for CIRCUMFERENCE.
10. Write the number 10 by the picture for QUADRANT.

SIGHT RECOGNITION
Turn to pages 2 and 3 in your test. Look at the pictures in the boxes. Circle the word for each picture.

DECODING/ENCODING
Turn to pages 4 and 5 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.
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.

READING COMPREHENSION
Turn to page 6 in your test. Write each word under its definition. Refer to Student Support Materials for answer key.

BASIC WRITING
Turn to page 7 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.
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irregular
diagonal
congruent
radius
diameter
circumference
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- diagonal
- radius
- regular
- quadrant
- polyhedron
- congruent
- circumference
- polygon
- diameter
UNIT 7
Geometry
Alaskan Math Standards (GLE’s) for This Unit

These Alaskan math standards underly the language development of the unit. Many of these standards are addressed during the regular math program and in the concrete introduction of the key vocabulary words for the unit.

The student demonstrates an understanding of geometric relationships by:

[7] G-1 using the attributes and properties of polygons (diagonals, number of sides and angles) to identify and classify regular or irregular polygons (M5.3.1)

[7] G-2 using the attributes and properties of prisms (vertices, length and alignment of edges, shape and number of bases, shape of faces) to identify and describe triangular or rectangular pyramids (M5.3.2)

The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by:

[7] G-3 using a scale factor to solve problems involving similar shapes (e.g., scale drawings, maps) (M5.3.3)

[7] G-4 drawing or describing the results of applying transformations such as translations, rotations, reflections, or dilations to figures (L) (M5.3.5)

The student solves problems (including real-world situations) by:

[7] G-5 determining the volume of cubes and rectangular prisms (M5.3.4)

[7] G-6 determining the surface area of rectangular prisms (M5.3.4)

[7] G-7 determining the circumference of a circle (M5.3.4)
Alaskan Language Standards (GLE’s) for This Unit

AK.R.3.1. Reading: The student uses strategies to decode or comprehend the meaning of words in texts. (E.B.1)

[7] 3.2.2. Reading aloud short factual information (e.g., reports, articles) (L)

AK.R.3.3. Reading: The student restates/summarizes and connects information. (E.B.3)

AK.R.3.5. Reading: The student follows written directions. (E.C.2)

[7] 3.5.1. Completing a task by following written, multi-step directions (e.g., answer a multi-faceted text question) (L)

[7] 3.5.2. Identifying the sequence of steps in a list of directions (e.g., what is the first step, what is the second step)

[7] 3.3.4. Applying rules of capitalization (e.g., titles and proper nouns)

AK.W.3.4. Writing: The student revises writing. (E.A.5, E.A.8)

AK.E.A. A student should be able to speak and write well for a variety of purposes and audiences. A student who meets the content standard should:

E.A.1. Apply elements of effective writing and speaking. These elements include ideas, organization, vocabulary, sentence structure, and personal style.

E.A.2. In writing, demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation.

E.A.3. In speaking, demonstrate skills in volume, intonation, and clarity.
INTRODUCTION OF MATH VOCABULARY
Geometry

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.

**VERTEX**

Darken the room. Give two students each a flashlight. Have the students stand diagonally from each other. The students should turn on the flashlights and shine the beams so that they intersect. Use this intersection point to introduce vertex related to a polygon.

**VERTICES**

Darken the room. Give two students each a flashlight. Have the students stand diagonally from each other. The students should turn on the flashlights and shine the beams so that they intersect. Use this intersection point to introduce vertex related to a polygon. Introduce the plural form vertices to the students.

**PRISM (TRIANGULAR)**

Before the lesson begins, cut a box so that it lies flat and has 3 sides. As the students watch, fold two of the sides up, creating a triangular prism. Show the students the tent picture from the back of this unit - use it to reinforce the concept of triangular prisms.
Geometry

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.

**EDG**

Use the cut-up box (from the previous page) to introduce edges to the students. Direct their attention to the edges of the prism. Have the students identify other edges in the classroom.

**SYM**

Fold a white sheet of paper in half. Use crayons or colored oil pastels to create a design on ONE side of the paper and touching the crease. When finished, re-fold the paper and rub vigorously with the side of a ruler. Open the paper to display the mirror image. Use this to introduce symmetry to the students.

**DIL**

Make a small ball of dough using flour and water. Show a packet/jar of yeast and the dough to the students. Have them suggest the effect the yeast would have on the dough, in the process of making bread. Use this to introduce dilation of scale to the students. Cite other examples of dilation (i.e. inflating a balloon, the growth of living things, etc.).
Geometry

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.

**PERIMETER**
Place a tray of soil in front of the students. Place a toy house on the soil. Have the students suggest how the owner of the house can show the land that he/she owns. The students may suggest a fence—use your finger to create a mock fence around the house. Use this to introduce perimeter to the students. Cite other examples of perimeters, such as clan territories, city boundaries, etc.

**RECTANGULAR (PRISM)**
Show the students the rectangular prism from the back of this unit. Have the students name the properties of the prism—the number of sides, shapes of the sides, etc. If an actual rectangular prism is available, show it to the students.

**TRAPEZOID**
Open a cardboard box and cut it so that it can be folded to represent a trapezoid—two of the sides should be parallel.
VOCABULARY
PICTURES
vertex

Common point of two rays

vertex

Common point of two line segments
VERTEX
VERTICES
PRISM
(TRIANGULAR)
EDGE
SYMMETRY
DILATION
PERIMETER
RECTANGULAR
(PRISM)
TRAPEZOID
LANGUAGE ACTIVITIES
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.

**Mini Pictures**

Provide each student with a copy of the mini-pictures page from the Student Support Materials. When you say the key words, the students must find the pictures for them. Then, have the students cut out the pictures. Say the keywords and the students should hold up the pictures for them.

**Tissue Drop**

Group the students in a circle. Stand in the center of the circle with a small piece of tissue paper or an inflated balloon. Give the vocabulary illustration to the students. The students should pass the illustration around the circle in a clockwise direction until you clap your hands. Then, the students should stop passing around the illustration. Toss something like a tissue paper or ball into the center and say a vocabulary word. The student who has the illustration for that word must rush into the circle to catch the object before it hits the floor.

**Over and Under**

Group the students into two teams. Mount the vocabulary pictures on the board. Give the first player in each team a ball. When you say, “Go,” the first player in each team must pass the ball to the next player, over his/her head. The next player must then pass the ball to the third player, between his/her legs. The players should continue with this over/under sequence until the last player in a team receives the ball. When the last player receives the ball, he/she must rush to the board and identify a picture for a vocabulary word that you say. The first player to do this successfully wins the round. Repeat until all players in each team have had a chance to respond in this way.

**Roll ‘Em Again Sam**

Provide each student with two flashcards. Each student should then write a number between 1 and 6 on each of his/her cards — one number per card. When the students’ number cards are ready, toss two dice. Call the two numbers showing on the dice. Any student or students who have those two numbers on their number cards must then find a vocabulary graphic you name (you may wish to have the vocabulary graphics mounted on the board and numbered, for easy identification). The students may change number cards after each round of the activity.
Language and Skills Development

Knock Knees
Mount the vocabulary pictures on the board. Group the students into two teams. Give a small, hard ball to the first player in each team. The first player in each team must place the ball between his/her knees. Say a vocabulary word. When you say “Go,” the two players must then walk to the pictures without losing the balls. The first player to reach the vocabulary pictures and identify the picture for the word you said wins the round. If a player loses his/her ball, he/she must return to his/her team and begin again. Repeat until all players have played.

Toothpick Pass
Mount the vocabulary graphics on the board and number each graphic. Group the students in a circle. Give each student a toothpick. Place a lifesaver over one or more of the toothpicks. When you say “Go,” the students should pass the lifesaver(s) around the circle in a clockwise direction. When you clap your hands, the students should stop passing the lifesaver(s). Say a vocabulary word. The student or students who have the lifesavers must identify the NUMBER of a graphic that describes the word you named. Repeat until many students have responded in this way.

All in Knots
Group the students into two teams. Tie two lengths of rope in a knot (use the same knot for each rope). Skipping ropes are ideal for this activity. Mount the vocabulary graphics on the board. Give a knotted rope to the first player in each team. Say a vocabulary word. When you say “Go,” the first player in each team must then attempt to untie the knot he/she has. The first player who unties his/her knot, rushes to the board, and identifies the vocabulary graphic for the word you said, wins the round. Repeat until all players have participated.
Right or Wrong?
Mount the vocabulary pictures on the board. Point to one of the pictures and say its vocabulary word. The students should repeat the vocabulary word for that picture. However, when you point to a picture and say an incorrect vocabulary word for it, the students should remain silent. Repeat this process until the students have responded a number of times to the different vocabulary pictures.

The Disappearing Pictures
Mount five or six pictures on the board, vertically. Point to the picture at the top and tell the students to name it. Continue in this way until the students have named all of the pictures from top to bottom. Then, remove the last picture and repeat this process—the students should say all of the vocabulary words, including the name for the “missing” picture. Then, remove another picture from the board and have the students repeat this process. Continue in this way until the students are saying all of the vocabulary words from a blank board or until the students cannot remember the “missing pictures.”

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.

Colander
Before the activity begins, obtain a sheet of construction paper equal in size to the size of your vocabulary pictures. Use a single hole punch to punch holes in the sheet. Place the sheet over one of the vocabulary pictures. Hold the sheet and vocabulary picture up so that the students can see them. The students should attempt to identify the vocabulary picture from the parts they can see through the holes in the construction paper. The first student to do this correctly wins the round. This activity may also be done in team form. In this case, the first player to correctly identify the vocabulary picture wins the round.
Language and Skills Development

Illustration Build-Up
Mount the vocabulary illustrations on the chalkboard. Point to two of the illustrations. The students should then say the vocabulary words for those two illustrations. Then, point to another illustration. The students should repeat the first two vocabulary words and then say the vocabulary word for the third illustration you pointed to. Continue in this way until the students lose the sequence of words.

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

Number Draw
Provide each student with a blank flashcard. Say a number to each student (between one and the number of students in your class). Each student should write his/her number on his/her number card. Prepare a matching set of number cards and place the cards in a container. Reach into the container and remove one of the number cards. Call the number showing on it. The student who has that number must identify a vocabulary picture on the board (or repeat a sentence that you said at the beginning of the round). Repeat this process until all students have responded.
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.

Sight Recognition

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.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Decoding/Encoding

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.
The Lost Syllable
Say a syllable from one of the sight words. Call upon the students to identify the sight word (or words) that contain that syllable. Depending upon the syllable you say, more than one sight word may be the correct answer. This activity may also be done in team form. In this case, lay the sight word cards on the floor. Group the students into two teams. Say a syllable from one of the sight words. When you say “Go,” the first player in each team must rush to the sight word cards and find the sight word that contains the syllable you said.

Flashlight Encode
Cut each of the sight words in half. Mount all of the word halves in a scattered form on the chalkboard. Stand in front of the chalkboard with two flashlights. Shine the light of one flashlight on a word half. Then, shine the light of the other flashlight on its matching half. The students should say the sight word. However, when the lights of the two flashlights are shining on word halves that do not go together, the students should remain silent. If four flashlights are available, this activity may be done in team form. In this case, give the first player in each team two flashlights. Say a sight word. The first player in each team must then use his/her two flashlights to illuminate the word halves for the sight word you said. The first player to do this correctly wins the round.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Reading Comprehension

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.
Language and Skills Development

WRITING

Word Build
Provide each student with writing paper and a pen. Cut each of the sight words into its individual letters. Give each student one of the cut out letters. Each student should then glue the cut out letter onto his/her sheet of writing paper. Then, each student should add the missing letters to complete the original sight word. Afterwards, review the students’ responses. You may wish to provide each student with more than one cut out letter so that he/she writes a number of the sight words.

Backwards Spell
Provide each student with writing paper and a pen. Spell one of the sight words backwards. When you have completed the spelling of the word in this way, each student should then write the word you spelled on his/her sheet of paper, writing the letters of the word in their correct order. The students should not begin to write the word until AFTER you have completed the backwards spelling of the word. Repeat this process with other sight words. This activity may also be done in team form. In this case, group the students into two teams. Spell one of the sight words backwards. When you say “Go,” the first player from each team must rush to the chalkboard and write the word that you said - writing the letters of the word in their correct sequence. The first player to do this correctly wins the round. Repeat until all players have participated.

What’s Missing?
Before the activity begins, prepare a page that contains clozure sentences - the sight words having been left out. Provide each student with a copy of the page. The students should read the clozure sentences carefully and then each student should write the vocabulary words in the sentences. This activity may also be done in team form. In this case, write a clozure sentence on the chalkboard (omitting the sight word or words). Group the students into two teams. When you say “Go,” the first player from each team must rush to the chalkboard and write the sight word(s) on the chalkboard that complete the sentence correctly. The first player to do this wins the round. Repeat until all players have had a chance to participate.
Language and Skills Development

Word Descriptions
Mount the sight words on the chalkboard. Provide the students with writing paper and pens. Then, describe the features of one of the sight words. This may include the number of letters, syllables, etc. After describing the features of the sight word, each student should write the sight word he/she feels fits the description you gave. Repeat this process with other sight words. Afterwards, review the students’ responses.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, 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
prism
edge
vertex
vertices

trapezoid

symmetry
dilation

perimeter

rectangular
STUDENT SUPPORT MATERIALS

Reading  ●  Sight Recognition
Sight Words Activity Page

Have the students circle the word for each picture.
prism
edge
vertex
vertices
trapezoid
symmetry
dilation
perimeter
rectangular

prism
edge
vertex
vertices
trapezoid
symmetry
dilation
perimeter
rectangular
Sight Words Activity Page

Write the numbers on their correct vocabulary graphics.

1. prism
2. edge
3. vertex
4. vertices
5. trapezoid
6. symmetry
7. dilation
8. perimeter
9. rectangular
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.

<table>
<thead>
<tr>
<th>prism</th>
<th>perimeter</th>
<th>dilation</th>
<th>trapezoid</th>
<th>vertices</th>
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<th>symmetry</th>
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<td>rectangular</td>
<td>edge</td>
</tr>
</tbody>
</table>

i r a r e c t a n g u l a r y l r r
m e d g e c t r a p e z o i d m l t
p r i s m t r a p e z m d i d o t m
i a z r p r i s m t s y m m e t e a
e i e l l i g x e e z s x t r e e d
d e o o r e e m a t v e r t i c e s
v d i l a t i o s v m y y r l r l l i
p t l c v e r t i e p e n s o e r r
s y m m e t r y s r v e r t e x e t
g d v e r t c p e m i i p t d e
r e c t a n g u l a a t e i e d n s
e m i e v i c e d y d i l a t i o n
t z c e i a m e t e s v e g g e l r
v r a t e d p y y o c i e t e e y r
y i e d t r r m e i e r p g d p r r
z p e r i m e t e r a e d e e n e r
d r y r n r e e p e r i m e t e r n
i t i t d o a i c i e g u e i r c t
r r s z r m p z p a c m d d t r i x
a c i e u t t e y n r e g a a p e c
Sight Words Activity Page

<table>
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<th>prism</th>
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<td>vertex</td>
<td>rectangular edge</td>
<td></td>
</tr>
<tr>
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<td></td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

Answer Key: Key # 1 - 817283
STUDENT SUPPORT MATERIALS

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

____________________ism

ed____________________

ver____________________

ver____________________ces

trapez____________________d

mm ti oi
ge tex
Encoding Activity Page

sy______________etry

di______________tion

peri______________ter

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

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

**u rectangular**

---

**terpemeri**

---

**zoidtrape**

---
Encoding Activity Page
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. A triangular prism
   - is a solid object that has one end and all flat sides.
   - is a solid object that has irregular sides and irregular ends.
   - is a solid object that has two identical ends and all flat sides.
   - is a solid object that has different dimensions at both ends.

2. The edge is
   - the line where two surfaces meet.
   - the radius of a polygon.
   - the scale of an average area.
   - the diameter of a polyhedron.

3. A vertex is
   - the radius of a circle.
   - a point where two or more straight lines meet.
   - a point where a congruent shape is on a diagonal.
   - the diameter of a circle.

4. Corners of polygons are
   - whole numbers.
   - circumference.
   - vertices.
   - irregular.

5. A trapezoid is a
   - pattern made from functions and congruent shapes.
   - quadrilateral with one pair of opposite sides parallel.
   - shape that has no opposite sides.
   - triangle with one pair of opposite sides.

6. Symmetry is when
   - a shape dilates and its ratio changes.
   - one shape is regular and the other is irregular.
   - an ordered pair is part of a formula.
   - one shape becomes exactly like another if you flip, slide or turn it.
What’s the Answer?

7) Dilation is when something gets
   - displayed.
   - bigger.
   - smaller.
   - rules.

8) The perimeter of a circle is called the
   - parentheses.
   - vertex.
   - degree.
   - circumference.

9) A rectangular prism is a
   - circle with a big diameter.
   - polyhedron that has six sides that are rectangles.
   - polygon that has six sides.
   - diagonal line found inside a shape.
What's the Answer?

ANSWER KEY

1. A triangular prism
   - is a solid object that has one end and all flat sides.
   - is a solid object that has regular sides and regular ends.
   - is a solid object that has two identical ends and all flat sides.
   - is a solid object that has different dimensions at both ends.

2. The edge is
   - the line where two surfaces meet.
   - the radius of a polygon.
   - the scale of an average area.
   - the diameter of a polyhedron.

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9. A rectangular prism is a
   - circle with a big diameter.
   - polyhedron that has six sides that are rectangles.
   - polygon that has six sides.
   - diagonal line found inside a shape.
Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1. In a triangular prism
2. The circumference of a circle
3. A vertex is where
4. More than one vertex is
5. A trapezoid is a quadrilateral with
6. Flipping a shape over can
7. Dilation is when
8. The line where 2 surfaces meet is
9. A rectangular prism has

A. called vertices.
B. called vertices.
C. a figure gets bigger.
D. an edge.
E. two or more lines meet.
F. can be called its perimeter.
G. produce symmetry.
H. the cross section is the same all along its length.
I. six faces or sides.

1→__________  2→__________  3→__________  4→__________
5→__________  6→__________  7→__________  8→__________
9→__________
Reading Comprehension Activity Page

ANSWER KEY

1. In a triangular prism called vertices.
2. The circumference of a circle called vertices.
3. A vertex is where a figure gets bigger.
4. More than one vertex is an edge.
5. A trapezoid is a quadrilateral with two or more lines meet.
6. Flipping a shape over can be called its perimeter.
7. Dilation is when produce symmetry.
8. The line where 2 surfaces meet is the cross section is the same all along its length.
9. A rectangular prism has six faces or sides.

1→ H  2→ F  3→ E  4→ A
5→ B  6→ G  7→ C  8→ D
9→ I
<table>
<thead>
<tr>
<th>Definition</th>
<th>Word</th>
</tr>
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<td>This is triangular and has two ends that are the same.</td>
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</tr>
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<td>edge</td>
</tr>
<tr>
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<td>perimeter</td>
</tr>
<tr>
<td>This relates to something that gets bigger.</td>
<td>symmetry</td>
</tr>
<tr>
<td>This is the distance around two dimensional shapes.</td>
<td>prism</td>
</tr>
<tr>
<td>This prism has six sides or faces.</td>
<td>rectangular</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
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<td></td>
<td><strong>trapezoid</strong></td>
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</table>
STUDENT SUPPORT MATERIALS

Writing
Writing Activity Page

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

_____ism
ed______
ver______x
ver______ces
trapez______d
sy______etry
di______tion
peri______ter
rectang______ar
Have the students complete the writing of the key math words.

p______________________m
e_______________________e
v_______________________x
v______________________es
tr______________________d
sy______________________y
di______________________n
p______________________er
r_______________________ar
Basic Writing Activity Page

Have the students write the word for each picture.

1. Prism
2. Cabinet
3. Vertex
4. Mirror
5. Triangle
6. Rectangle
7. Polygon
8. Graph
9. Circle
10. Polygon
Basic Writing Activity Page

Have the students write the word for each picture.
ACROSS

1  This is a point where two or more lines meet.
2  This can relate to "mirror" imaging.
4  This prism has 6 sides or faces.
5  This is the distance around two dimensional shapes.
6  This relates to something that gets bigger.
7  This is the line where two surfaces meet.

DOWN

1  These can be the corners of polygons.
3  This is a quadrilateral with two opposite sides that are parallel.
5  This is triangular and has two ends that are the same.
Crossword Puzzle Answers

- VERTEX
- SYMMETRY
- RECTANGULAR
- PERIMETER
- DILATION
- SIMEDG
UNIT ASSESSMENT
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 **PRISM**.
2. Write the number 2 by the picture for **EDGE**.
3. Write the number 3 by the picture for **VERTEX**.
4. Write the number 4 by the picture for **VERTICES**.
5. Write the number 5 by the picture for **TRAPEZOID**.
6. Write the number 6 by the picture for **SYMMETRY**.
7. Write the number 7 by the picture for **DILATION**.
8. Write the number 8 by the picture for **PERIMETER**.
9. Write the number 9 by the picture for **RECTANGULAR**.

**SIGHT RECOGNITION**

Turn to page 2 and 3 in your test. Look at the pictures in the boxes. Circle the word for each picture.

**DECODING/ENCODING**

Turn to page 4 and 5 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.
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.

READING COMPREHENSION

Turn to page 6 in your test. Write each word under its definition. Refer to Student Support Materials for answer key.

BASIC WRITING

Turn to page 7 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.
prism  edge
vertex  vertices
trapezoid  symmetry
dilation  perimeter
rectangular

prism  edge
vertex  vertices
trapezoid  symmetry
dilation  perimeter
rectangular

prism  edge
vertex  vertices
trapezoid  symmetry
dilation  perimeter
rectangular

prism  edge
vertex  vertices
trapezoid  symmetry
dilation  perimeter
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<th>trapezoid</th>
</tr>
</thead>
<tbody>
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<td>dilation</td>
<td>symmetry</td>
<td>perimeter</td>
<td>prism</td>
</tr>
<tr>
<td>rectangular</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>
UNIT 8
Geometry
Alaskan Math Standards (GLE’s) for This Unit

These Alaskan math standards underly the language development of the unit. Many of these standards are addressed during the regular math program and in the concrete introduction of the key vocabulary words for the unit.

The student demonstrates an understanding of geometric relationships by:

[7] G-1 using the attributes and properties of polygons (diagonals, number of sides and angles) to identify and classify regular or irregular polygons (M5.3.1)

[7] G-2 using the attributes and properties of prisms (vertices, length and alignment of edges, shape and number of bases, shape of faces) to identify and describe triangular or rectangular pyramids (M5.3.2)

The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by:

[7] G-3 using a scale factor to solve problems involving similar shapes (e.g., scale drawings, maps) (M5.3.3)

[7] G-4 drawing or describing the results of applying transformations such as translations, rotations, reflections, or dilations to figures (L) (M5.3.5)

The student solves problems (including real-world situations) by:

[7] G-5 determining the volume of cubes and rectangular prisms (M5.3.4)

[7] G-6 determining the surface area of rectangular prisms (M5.3.4)

[7] G-7 determining the circumference of a circle (M5.3.4)
Alaskan Language Standards (GLE’s) for This Unit

AK.R.3.1. Reading: The student uses strategies to decode or comprehend the meaning of words in texts. (E.B.1)

[7] 3.2.2. Reading aloud short factual information (e.g., reports, articles) (L)

AK.R.3.3. Reading: The student restates/summarizes and connects information. (E.B.3)

AK.R.3.5. Reading: The student follows written directions. (E.C.2)

[7] 3.5.1. Completing a task by following written, multi-step directions (e.g., answer a multi-faceted text question) (L)

[7] 3.5.2. Identifying the sequence of steps in a list of directions (e.g., what is the first step, what is the second step)

[7] 3.3.4. Applying rules of capitalization (e.g., titles and proper nouns)

AK.W.3.4. Writing: The student revises writing. (E.A.5, E.A.8)

AK.E.A. A student should be able to speak and write well for a variety of purposes and audiences. A student who meets the content standard should:

E.A.1. Apply elements of effective writing and speaking. These elements include ideas, organization, vocabulary, sentence structure, and personal style.

E.A.2. In writing, demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation.

E.A.3. In speaking, demonstrate skills in volume, intonation, and clarity.
INTRODUCTION OF MATH VOCABULARY
Geometry

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.

**SCALENE**

Lay white flour on a portion of black paper. Use your finger to create the isosceles, equilateral, and scalene triangles.

(continued below)

**ISOSCELES**

Provide the students with lengths of yarn or string. Have them practice making the isosceles, equilateral, and scalene triangles, using the yarn or string.

(continued below)

**EQUILATERAL**

Use a flashlight to draw the different triangles on a wall. After drawing a triangle with the light of the flashlight, call upon the students to identify it by its type (isosceles, scalene, or equilateral).
Geometry

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.

**ACUTE**

*Introduce right, acute, and obtuse angles using the yarn/string.*

(continued below)

**OBTUSE**

*Provide each student with a pipe cleaner. Create an angle using your string/yarn; the students must then create the same angle using their pipe cleaners. Repeat the names of the angles many times.*

(continued below)

**RIGHT**

*Direct the students’ attention to angles in the classroom — e.g., window frames, door, etc. Attempt to locate samples of the different angles in the room.*

*Have two students stand — name one of the angles; the two students should lay on the floor to create that angle. Repeat, with other pairs of students.*
Geometry

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.

END POINTS

Obtain a length of rope. Have two students hold the rope at the front of the class to represent a clothesline. Draw the students’ attention to the ends of the clothesline; use this to introduce end points to the students.

QUADRILATERAL

Collect a variety of photographs of different sizes. Mix all of the pictures together and lay them out in front of the students. Have the students tell what is the same about all of the pictures. Lead them to suggest that all of the pictures have four straight sides.

PYRAMID

Show the students the picture of the human pyramid from the back of this unit. Relate this to the picture of the pyramid, also at the back of this unit. Use moist soil on a tray to create a pyramid as the students watch. Direct their attention to the base, sides, and edges of the triangle.
VOCABULARY
PICTURES
SCALENE
ISOSCELES
EQUILATERAL
ACUTE
OBTUSE
90°
RIGHT ANGLED
Line Segment

End Point
END POINTS
QUADRILATERAL
PYRAMID
LANGUAGE ACTIVITIES
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.

Mini Pictures
Provide each student with a copy of the mini-pictures page from the Student Support Materials. When you say the key words, the students must find the pictures for them. Then, have the students cut out the pictures. Say the keywords and the students should hold up the pictures for them.

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.

Hop the Line
Make a masking tape line on the floor. Have the students stand on the line—their toes touching the masking tape. Have the students listen for a specific word or sentence. Say a number of other words or sentences, eventually repeating the word or sentence you said at the beginning of the round. When the students hear that word or sentence, they must hop to the other side of the line. When the students hop to the other side of the line, they should then turn around and place their toes on the line once again. Repeat this process using a number of different vocabulary words or sentences.

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.
Join Those Halves
Make an extra set of vocabulary pictures. Cut each of the vocabulary illustrations in half. Spread the illustration halves on the floor in a scattered form. Group the students into two teams. Give the first two players in each team a long length of string or yarn. Say a vocabulary word. When you say “Go,” the first two players in each team must rush to the illustration halves. The object of the activity is for the players to use the string/yarn to join together the two halves which make up the illustration for the word you said. The first pair of players to do this successfully wins the round. Repeat until all players have participated.

Roll ‘Em Again Sam
Provide each student with two flashcards. Each student should then write a number between 1 and 6 on each of his/her cards — one number per card. When the students’ number cards are ready, toss two dice. Call the two numbers showing on the dice. Any student or students who have those two numbers on their number cards must then find a vocabulary graphic you name (you may wish to have the vocabulary graphics mounted on the board and numbered, for easy identification). The students may change number cards after each round of the activity.
Run and Catch
Group the students in a circle. Say a number to each student. Then, give each student a vocabulary picture. Stand in the center of the circle with a small portion of tissue paper. When you say “Go,” the students should pass the vocabulary pictures around the circle in a clockwise direction. When you clap your hands, the students should stop passing the pictures. Call one of the students’ numbers and toss the tissue paper into the circle at the same time. The student who has the number that you called must orally identify the vocabulary picture he/she has and then rush into the circle to catch the tissue paper before it hits the floor. Repeat this process until many students have responded.

Half Match
Before the lesson begins, prepare a photocopy of each of the vocabulary pictures. Cut each of the photocopied pictures in half. Give the picture halves to the students (a student may have more than one picture half). Say one of the vocabulary words. The two students who have the halves of the picture for that word must show their halves and repeat the word orally. Continue in this way until all of the vocabulary words have been reviewed. This activity may be repeated more than once by collecting, mixing, and redistributing the picture halves to the students. This activity may also be adapted for team form. To do this, cut each of the vocabulary pictures in half. Place half of the pictures in one pile and the other halves in another pile (one pile for each team). Say a vocabulary word. When you say “Go,” the first player from each team must rush to his/her pile of picture halves. Each player must find the half of the picture for the vocabulary word you said. The first player to correctly identify the picture half and to repeat the vocabulary word for it wins the round. Repeat until all players have played.

Number What?
Mount the vocabulary graphics on the chalkboard. Number each graphic. Call one of the numbers and the students should identify the graphic that is labeled with that number. Continue in this way until all of the vocabulary graphics have been identified a number of times. To add “spice” to the activity, you may wish to say a simple oral math problem, the answer to which is equal to one of the numbers on the chalkboard. (For example, you could say, “Six plus four, minus three, plus one.” The answer would be “Eight.” In this case, the students should identify the vocabulary graphic with the numeral “8” beside it.) This activity may also be done in team form. The first player to solve the math problem and then to identify the graphic that is labeled with the number answer to the math problem, wins the round.
**Back Match**
Prepare a photocopy of each of the vocabulary pictures. Cut the photocopied pictures in half. Group the students in a circle. Walk around the outside of the circle, attaching the picture halves to the students’ backs. Do not let the students see which picture halves they have on their backs. When each student has a picture half on his/her back, say “Go.” The students must then match themselves together, according to the picture halves on their backs. Since the students will not know which pictures halves they have, they will have to rely on each other for assistance. When the students have correctly matched themselves together, have the students in each pair verbally identify the vocabulary word represented by the picture.

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

**Draw**
Give all of the cards from a deck of playing cards to the students (preferably, all students should have the same number of cards). Have another deck of cards for yourself. Mount the vocabulary illustrations on the chalkboard. Hold one of your playing cards next to a vocabulary illustration. The student who has the matching playing card must then say the word for that picture. The student should then place that playing card to the side. The first student who has no playing cards left in his/her hands wins the game. This activity may be repeated more than once by collecting, mixing, and redistributing the playing cards to the students.
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.

Sight Recognition

Right or Wrong?
Mount the sight words on the board. Point to one of the sight words and name it. The students should repeat the sight word. However, when you point to a sight word and say the wrong word for it, the students should remain silent. Repeat this process until the students have responded accurately to all of the sight words a number of times.

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.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Decoding/Encoding

Group Spell
Group the students into two groups. Identify one group as “consonants” and the other group as “vowels.” Say a sight word. Then, the students should spell the word — the students in the “consonant” group saying the consonants and the students in the “vowels” groups saying the vowels. The students should continue in this way until the sight word has been correctly spelled. Repeat with other sight words, switching the groups periodically during the activity.
Find the Other Half
Group the students into two teams. Give the first player in each team a flashlight. Cut each of the sight words in half. Mix the word halves together and attach them to the chalkboard in a scattered form. Stand between the two teams with a flashlight. Shine the light of your flashlight on a word half. The first player in each team must turn on his/her flashlight and find the other half of the word for the word half your light is shining on. The first student to do this correctly wins the round. Repeat.

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 complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Reading Comprehension

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.
Language and Skills Development

WRITING

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, 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
right angled quadrilateral pyramid
STUDENT SUPPORT MATERIALS

Reading  •  Sight Recognition
Sight Words Activity Page

Have the students circle the word for each picture.

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

90°
Sight Words Activity Page

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

Write the numbers on their correct vocabulary graphics.

1. end points
2. scalene
3. isosceles
4. equilateral
5. acute
6. obtuse
7. right angled
8. quadrilateral
9. pyramid
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.

equilateral
end points
pyramid

quadrilateral
isosceles
obtuse

right angled
acute
scalene

e t c e g m q a s l i e e c s s r l
d n r e s u a c u t e c a s o e e
y s u u a s y s p y r a m i d m e s
c c e a s a h d s c a l e n e a r a
g s c a l e d a c u t e a a s a a e
q g l r a e o e n d p o i n e a u d
m q q i d i s o b t e n d y a t t i
n a o b t u s e o s l r t e s i h e
o i q u a d r i l a t e r t d a e a
l g n n t y n t s t t p y r a p e b
q g u d i n r r e q u i l a t e c e
c r e l l l c d e t l r h i i r s e
n p i s o s c e l e s m t a d i b s
a a o t q u a d r i l a t e r a l n
e e m d s e n d p o i n t s q i p m
r i g h t a n g l e d e o t a e e
l t r i g h t a n g g t d e t u e s s
s a e o i s o s c e l e s t s l l s n
l g s e e q u i l a t e r a l d s h
d b d u s s l e s p a a a d t p l t
Sight Words Activity Page

ANSWER KEY

equilateral
end points
pyramid

quadrilateral
isosceles
obtuse

right angled
acute
scalene

Find each of the following words.
equilateral
end points
pyramid
quadrilateral
isosceles
obtuse
right angled
acute
scalene
STUDENT SUPPORT MATERIALS

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

end p_________________ts

____________________alone

equilat_________________al

____________________cute

____________________tuse

<table>
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<tr>
<th>sc</th>
<th>a</th>
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</tr>
</thead>
<tbody>
<tr>
<td>er</td>
<td>dri</td>
<td></td>
</tr>
</tbody>
</table>
right ang___________
qua____________lateral
________________ramid
is________________eles
Have the students cut out the word halves and glue them together to create the key words for this unit.

- end po
- tuse
- sca
- les
- isosce
- led
- equila
- ints
- a
- teral
Encoding Activity Page

ob   teral
right ang   lene
quadrila   mid
pyra   cute
Encoding Activity Page

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

sos  les  i  ce

la  e  ter  qui  al

dri  qua  al  la  ter
Encoding Activity Page

ra   py   mid

_________  _______  _______
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. Endpoints mark...
   - the vertices of quadrilaterals.
   - the edges of irregular polygons.
   - the end of line segments.
   - the exponents in whole numbers.

2. In a scalene triangle...
   - all sides and angles are the same.
   - all sides are the same but angles are different.
   - all angles are the same but sides are different.
   - all sides and angles are different.

3. In an isosceles triangle...
   - two sides are the same length.
   - all sides and angles are different.
   - all sides are the same length.
   - no sides are the same length.

4. An equilateral triangle has...
   - two congruent sides.
   - no congruent sides.
   - an irregular radius.
   - three congruent sides.

5. In an acute triangle, all angles are...
   - more than 180°.
   - less than 90°.
   - more than 90°.
   - obtuse.

6. An obtuse triangle has...
   - one angle that is more than 90° and less than 180°.
   - two angles are less than 180° but more than 90°.
   - all angles are less than 90°.
   - all angles are right angles.
What’s the Answer?

7. A right angled triangle has...
   - two obtuse angles.
   - three congruent vertices.
   - one 90° angle.
   - two angles that are more than 180°.

8. A quadrilateral is...
   - a polyhedron with 4 faces.
   - a flat shape with four straight sides.
   - a four sided shape with no straight lines.
   - a polygon with equal vertices.

9. The base of a pyramid is a...
   - polyhedron.
   - quadrilateral.
   - polygon.
   - vertex.
What’s the Answer?

ANSWER KEY

1. Endpoints mark...
   - the vertices of quadrilaterals.
   - the edges of irregular polygons.
   - the end of line segments.
   - the exponents in whole numbers.

2. In a scalene triangle...
   - all sides and angles are the same.
   - all sides are the same but angles are different.
   - all angles are the same but sides are different.
   - all sides and angles are different.

3. In an isosceles triangle...
   - two sides are the same length.
   - all sides and angles are different.
   - all sides are the same length.
   - no sides are the same length.

4. An equilateral triangle has...
   - two congruent sides.
   - no congruent sides.
   - an irregular radius.
   - three congruent sides.

5. In an acute triangle, all angles are...
   - more than 180°.
   - less than 90°.
   - more than 90°.
   - obtuse.

6. An obtuse triangle has...
   - one angle that is more than 90° and less than 180°.
   - two angles are less than 180° but more than 90°.
   - all angles are less than 90°.
   - all angles are right angles.
What’s the Answer?

7 A right angled triangle has...
   • two obtuse angles.
   • three congruent vertices.
   • one 90° angle.
   • two angles that are more than 180°.

8 A quadrilateral is...
   • a polyhedron with 4 faces.
   • a flat shape with four straight sides.
   • a four sided shape with no straight lines.
   • a polygon with equal vertices.

9 The base of a pyramid is a...
   • polyhedron.
   • quadrilateral.
   • polygon.
   • vertex.
Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1. End points show ___________
2. In a scalene triangle, all ___________
3. In an isosceles triangle ___________
4. In an isosceles triangle ___________
5. In an acute triangle, all inside ___________
6. An obtuse triangle has ___________
7. A right angled triangle has one ___________
8. A quadrilateral is a flat shape ___________
9. A pyramid has ___________

A. three congruent sides.
B. an outside angle that is more than 90°.
C. a polygon as a base.
D. angles and sides are different in size.
E. 90° angle.
F. two sides are the same length.
G. with four flat sides.
H. the ends of a line segment.
I. angles are less than 90°.
Reading Comprehension Activity Page

**ANSWER KEY**

1. End points show
2. In a scalene triangle, all
3. In an isosceles triangle
4. In an isosceles triangle
5. In an acute triangle, all inside
6. An obtuse triangle has
7. A right angled triangle has one
8. A quadrilateral is a flat shape
9. A pyramid has

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B. an outside angle that is more than 90°.
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I. angles are less than 90°.

<p>| 1 → H | 2 → D | 3 → F | 4 → A |
| 5 → I | 6 → B | 7 → E | 8 → G |
| 9 → C |</p>
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<td>This shape has a polygon as a base.</td>
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</table>

- **acute**
- **right angled**
- **end points**
- **equilateral**
- **obtuse**
- **scalene**
- **pyramid**
- **isosceles**
- **quadrilateral**
<table>
<thead>
<tr>
<th>Description</th>
<th>Triangle Description</th>
<th>Shape Description</th>
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STUDENT SUPPORT MATERIALS

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

end p____nts
scal______
iso_____les
equi____eral
ac______
_____tuse
right _____led
quadr____eral
_____amid
Have the students complete the writing of the key math words.

e_____________________ts
sc_____________________e
is_____________________s
eq_____________________l
ac_____________________e
ob_____________________e
ri_____________________ed
qu_____________________l
py_____________________d
Have the students write the word for each picture.

- 90°
- Pyramid
- End Point
- Line Segment

- Triangle
- Quadrilateral
- Pentagon
Basic Writing Activity Page

Have the students write the word for each picture.
ACROSS

3 In this triangle, all sides are different lengths and no sides or angles are equal.
6 These mark the ends of a line segment.
7 This is a flat shape with four straight sides.
8 In this triangle, 2 sides are the same length.
9 This triangle has one 90 degree angle.

DOWN

1 This shape has a polygon as a base.
2 In this triangle, all inside angles are less than 90 degrees.
4 This triangle has three congruent sides.
5 This triangle has an outside angle that is more than 180 degrees.
Crossword Puzzle Answers

P  A  S  C  A  L  E  N  E
Y  C  R  U  Q
P  T  O  N  I  S
Q  U  M  E  N  D - P  O  I  N  T  S
O  A  T  U  B  M
I  L  T  I  Q  U  A  D  R  I  L  A  T  E  R  A  L
S  T  E  I  S  O  S  C  E  L  E  S
R  A  T  S
R  I  G  H  T - A  N  G  L  E  D
UNIT ASSESSMENT
**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 **END POINTS**.
2. Write the number 2 by the picture for a **SCALENE TRIANGLE**.
3. Write the number 3 by the picture for an **ISOSCELES TRIANGLE**.
4. Write the number 4 by the picture for an **EQUILATERAL TRIANGLE**.
5. Write the number 5 by the picture for an **ACUTE ANGLE**.
6. Write the number 6 by the picture for an **OBTUSE ANGLE**.
7. Write the number 7 by the picture for a **RIGHT ANGLED TRIANGLE**.
8. Write the number 8 by the picture for a **QUADRILATERAL**.
9. Write the number 9 by the picture for a **PYRAMID**.

**SIGHT RECOGNITION**

Turn to page 2 and 3 in your test. Look at the pictures in the boxes. Circle the word for each picture.

**DECODING/ENCODING**

Turn to page 4 and 5 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.
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.

READING COMPREHENSION
Turn to page 6 in your test. Write each word under its definition. Refer to Student Support Materials for answer key.

BASIC WRITING
Turn to page 7 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.
end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
scalene
isosceles
equilateral
acute
obtuse
right angled
quadrilateral
pyramid

end points
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<td>--------------------------------------------------</td>
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<tr>
<td>equilateral</td>
<td>acute</td>
<td>end points</td>
</tr>
<tr>
<td>right angled</td>
<td>pyramid</td>
<td>quadrilateral</td>
</tr>
<tr>
<td>scalene</td>
<td></td>
<td>isosceles</td>
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</table>

This shape has a polygon as a base.
UNIT 9
Measurement
Alaskan Math Standards (GLE’s) for This Unit

These Alaskan math standards underly the language development of the unit. Many of these standards are addressed during the regular math program and in the concrete introduction of the key vocabulary words for the unit.

The student demonstrates understanding of measurement techniques by

[7] MEA-3 applying a given scale factor to find missing dimensions of similar figures (M2.3.4)

[7] MEA-4 measuring various dimensions to one-sixteenth of an inch or millimeter (M2.3.1)

[7] MEA-5 accurately measuring a given angles using a protractor to the nearest plus or minus 2 degrees (M2.3.1)

[7] MEA-6 solving real-world problems involving elapsed time between world time zones (M2.3.5)
Alaskan Language Standards (GLE’s) for This Unit

AK.R.3.1. Reading: The student uses strategies to decode or comprehend the meaning of words in texts. (E.B.1)

[7] 3.2.2. Reading aloud short factual information (e.g., reports, articles) (L)

AK.R.3.3. Reading: The student restates/summarizes and connects information. (E.B.3)

AK.R.3.5. Reading: The student follows written directions. (E.C.2)

[7] 3.5.1. Completing a task by following written, multi-step directions (e.g., answer a multi-faceted text question) (L)

[7] 3.5.2. Identifying the sequence of steps in a list of directions (e.g., what is the first step, what is the second step)
[7] 3.3.4. Applying rules of capitalization (e.g., titles and proper nouns)

AK.W.3.4. Writing: The student revises writing. (E.A.5, E.A.8)

AK.E.A. A student should be able to speak and write well for a variety of purposes and audiences. A student who meets the content standard should:

E.A.1. Apply elements of effective writing and speaking. These elements include ideas, organization, vocabulary, sentence structure, and personal style.

E.A.2. In writing, demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation.

E.A.3. In speaking, demonstrate skills in volume, intonation, and clarity.
INTRODUCTION OF MATH VOCABULARY
Measurement

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.

**SCALE**

Show the students a toy car (or other toy model). Relate it to the actual item. If possible, tell the students the ratio of the model to the real thing. For example, (1:10) for 1 inch to 10 inches. Show the students a map; use it to reinforce the concept of scale.

**DATA**

Place a number of canned green beans in a bowl. Have each student select one bean; the students should open their beans and count the number of seeds inside. Record the data on the chalkboard, indicating the total number of seeds found. Have the students determine the average number of seeds found (review from unit 4).

**WHOLE NUMBER**

Lay a number of whole and partial cookies in front of the students. Have them locate the whole cookies. Use this to introduce whole numbers. The students should understand that those cookies that are not whole are fractions of the whole.
Measurement

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.

**DEGREE**

Show the students a wall clock that has moveable hands. As they watch, rotate the hour hand from 12 completely around to 12 again. Use this to introduce degrees to the students. They should understand that there are 360° in a circle. As the students watch, open a book to 180° (half open). Use the book to demonstrate 90°.

**SIMILAR**

Collect small and large cans of food. The cans should all be the same shape. Use the cans to lead the students to the concept of similar as it relates to shapes. Identify other similar items in the classroom (i.e. books, glasses, etc.).

**TIME ZONE**

Have a student hold a basketball in front of the class. Use a flashlight to represent the sun, shining on the earth (the ball). Have the student rotate the ball to represent the parts of the earth that have daylight and those that have night. Mount a map of the world on the board. Outline the 24 time zones on the map, noting the Alaska time zone in particular.
**Measurement**

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.

**PARENTHESES**

Introduce a few food containers to the students (i.e. a bag, box, and can). Lead the students to understand that all of the containers contain the foods within them. Lead this to the math container — parentheses. Demonstrate the use of parentheses as containers that hold or group things together (i.e. \((4,5)\), \(4x(5+2)\), etc.).

**DIMENSIONS**

Obtain two chocolate bars of the same make but different sizes (i.e. a regular bar and a mini bar of the same chocolate). Use this to draw the students' attention to the dimensions of the chocolate bars. Show samples of other dimensions that reflect width, depth, and height.

**PROTRACTOR**

Show a number of common items used to measure different things (i.e. a meat thermometer, a ruler, a measuring tape, etc.). Have the students suggest what is the same about all of the items. Lead them to suggest that they all measure something. Introduce the protractor as an instrument for measuring degrees. Show the students how to use the protractor.
VOCABULARY PICTURES
SCALE
DATA
WHOLE NUMBER
DEGREE
TIME ZONE
PARANTHESIS

Sealaska Heritage Institute
DIMENSIONS
PROTRACTOR
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.

Mini Pictures
Provide each student with a copy of the mini-pictures page from the Student Support Materials. When you say the key words, the students must find the pictures for them. Then, have the students cut out the pictures. Say the keywords and the students should hold up the pictures for them.

Airplane Land
Scatter the vocabulary pictures on the floor. Have the students sit in a large circle around the pictures. Prepare two paper airplanes. Give the airplanes to two students. Say one of the vocabulary words. The students should toss their airplanes, attempting to land them on the picture for the vocabulary word you said. Repeat until all students have participated.

Stare
Group the students into two teams. Tape the vocabulary graphics to a sheet. Have two students hold the sheet vertically so that the players in each team can see the graphics. Have the first player from each team stand behind the sheet. Give these two players flashlights. Say a vocabulary word. When you say “Go,” the two players must shine the lights of their flashlights through the sheet. The players should move the lights around on the surface of the sheet. When a player’s light is behind the graphic for the vocabulary word you said, the players in his/her team should clap. The player who first reaches the vocabulary graphic in this way wins the round. Repeat until all players in each team (and the two players holding the sheet) have had an opportunity to participate.

Knock Knees
Mount the vocabulary pictures on the board. Group the students into two teams. Give a small, hard ball to the first player in each team. The first player in each team must place the ball between his/her knees. Say a vocabulary word. When you say “Go,” the two players must then walk to the pictures without losing the balls. The first player to reach the vocabulary pictures and identify the picture for the word you said wins the round. If a player loses his/her ball, he/she must return to his/her team and begin again. Repeat until all players have played.
Language and Skills Development

Join Those Halves
Make an extra set of vocabulary pictures. Cut each of the vocabulary illustrations in half. Spread the illustration halves on the floor in a scattered form. Group the students into two teams. Give the first two players in each team a long length of string or yarn. Say a vocabulary word. When you say “Go,” the first two players in each team must rush to the illustration halves. The object of the activity is for the players to use the string/yarn to join together the two halves which make up the illustration for the word you said. The first pair of players to do this successfully wins the round. Repeat until all players have participated.

Over and Under
Group the students into two teams. Mount the vocabulary pictures on the board. Give the first player in each team a ball. When you say, “Go,” the first player in each team must pass the ball to the next player, over his/her head. The next player must then pass the ball to the third player, between his/her legs. The players should continue with this over/under sequence until the last player in a team receives the ball. When the last player receives the ball, he/she must rush to the board and identify a picture for a vocabulary word that you say. The first player to do this successfully wins the round. Repeat until all players in each team have had a chance to respond in this way.

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.
Right or Wrong?
Mount the vocabulary pictures on the board. Point to one of the pictures and say its vocabulary word. The students should repeat the vocabulary word for that picture. However, when you point to a picture and say an incorrect vocabulary word for it, the students should remain silent. Repeat this process until the students have responded a number of times to the different vocabulary pictures.

The Disappearing Pictures
Mount five or six pictures on the board, vertically. Point to the picture at the top and tell the students to name it. Continue in this way until the students have named all of the pictures from top to bottom. Then, remove the last picture and repeat this process—the students should say all of the vocabulary words, including the name for the “missing” picture. Then, remove another picture from the board and have the students repeat this process. Continue in this way until the students are saying all of the vocabulary words from a blank board or until the students cannot remember the “missing pictures.”

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.
Language and Skills Development

**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.

**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.

**Colander**
Before the activity begins, obtain a sheet of construction paper equal in size to the size of your vocabulary pictures. Use a single hole punch to punch holes in the sheet. Place the sheet over one of the vocabulary pictures. Hold the sheet and vocabulary picture up so that the students can see them. The students should attempt to identify the vocabulary picture from the parts they can see through the holes in the construction paper. The first student to do this correctly wins the round. This activity may also be done in team form. In this case, the first player to correctly identify the vocabulary picture wins the round.
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.

Sight Recognition

Balloon Burst
Before the activity begins, write sight words on small strips of paper. Roll each strip of paper and insert it into a balloon. Inflate each balloon and tie its end. Group the students into two teams. Have the teams sit on the floor in two lines, facing one another, with legs outstretched. The members of each team should sit as close together as possible. Place one of the balloons between the feet of the first player in each team. When you say “Go,” the players in each team must pass the balloon to the person next to them, using only their feet. When the last player receives the balloon, he/she must remove it from between his/her feet and then sit on it to burst it. When the balloon has popped, the student must retrieve the sight word strip and read it to the other students. The first team to complete this sequence correctly wins the round. Repeat until all or many of the students have responded.

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.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Decoding/Encoding

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.
Whispered Syllables
Group the students into two teams. Mount the sight word cards on the chalkboard. Whisper a syllable from one of the sight words to the first player in each team. When you say “Go,” the first player in each team must whisper the same syllable to the next player in the team. The players should continue to whisper the syllable in this way until the last player in the team hears it. When the last player hears the syllable, he/she must rush to the chalkboard and point to a sight word that contains that syllable. Repeat this process until all players have had an opportunity to identify a sight word in this way.

Fancy Foot
Cut each of the sight words into its individual letters/syllables. Mix all of the letters/syllables together. Have the students stand side by side, in a straight line (depending upon the number of students in your class, you may wish to select a group of students for this activity). Tape a cut out letter/syllable to one of each student’s feet so that he/she can read it. When each student has a letter/syllable taped to one of his/her feet in this way, say a sight word. The students who have the letters/syllables on their feet for the sight word you said, should then encode the sight word by placing their feet side by side so that the sight word is correctly spelled. Repeat this process until all of the sight words have been encoded correctly.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Reading Comprehension

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.
**Language and Skills Development**

**WRITING**

**Student Support Materials**
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

**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.

**What’s Your Letter?**
Provide each student with writing paper and a pen. Say a sight word. Each student should then write ONE letter from that word (any letter) on their paper. Review the students’ responses to determine if all letters from the sight word were used. If all letters from the sight word were not used, ask the students to identify the letters that are “missing.” Repeat with other sight words.

**Dash**
Group the students into two teams. Make two sets of dashes on the board — each set should be the same and should represent the number of letters in a sight word. When you say “Go,” the first player in each team must rush to his/her set of dashes on the board. Each player must then write a sight word that fits the number of dashes. Accept any sight word that fits the dashes. The first player to do this correctly wins the round. Repeat with other sets of dashes until all students have had an opportunity to participate.

**Mysterious Writing**
Provide each student with writing paper and a pen. Stand in front of the students with a pad of paper and a pencil. Hold the pencil in such a way that the students can see the top of it but not the point. Write one of the sight words. The students should watch the top of the pencil carefully while you write the word. Each student should guess what word you wrote, and write it on his/her own paper. Repeat this process with other sight words and review the students’ responses.
Meshy Words
Write a “meshword” on the chalkboard. To create a meshword, combine two word halves from different words. For example, for “scale” and “data” you might write “scada.” Provide each student with writing paper and a pen. The students should look at the meshword written on the chalkboard and attempt to identify the original words from which the halves were chosen. Each student should then write those two sight words on his/her sheet of paper. Repeat this process with other meshwords. This activity may be conducted in team form by writing a meshword on the chalkboard and having players from different teams attempt to identify the original words.
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
data
whole number
degree
similar
parentheses
scale
STUDENT SUPPORT MATERIALS

Reading • Sight Recognition
Sight Words Activity Page

Have the students circle the word for each picture.
Sight Words Activity Page

Write the numbers on their correct vocabulary graphics.

1. data
2. whole number
3. degree
4. similar
5. parentheses
6. scale
7. dimensions
8. protractor
9. time zone
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.

<table>
<thead>
<tr>
<th>whole number degree similar</th>
<th>time zone dimensions parentheses</th>
<th>scale data protractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>h t i e e d p a r e n t h e s e r e</td>
<td>i s r g e h i s e r s i e d a t a e</td>
<td>m d p r o t r a c t o n w n t t t t e</td>
</tr>
<tr>
<td>s n u e n s e t t t i m e z o n e o e</td>
<td>o e n r e a i n i e a s n s r s a b</td>
<td>o r l t e d o s a b d n o r d e t e</td>
</tr>
<tr>
<td>d e g r e e e h e t i m e z n d e</td>
<td>d w t t o d i m e n s i o n s o p s</td>
<td>s i m i l a r d s l e o e d e m n o</td>
</tr>
<tr>
<td>h i m e a n z i o c d r n s c a l a</td>
<td>e e w h o l e n u m b e r o p e l a</td>
<td>m h e l e s o e i r s e a r a s t a</td>
</tr>
<tr>
<td>l w p e r s e c w h o l e n u m o e</td>
<td>t e p r o t r a c t o r t d s r e l</td>
<td>e t r p d m p a r e n t h e s e s i</td>
</tr>
<tr>
<td>t l e d e g r e e d i m e n s i n a</td>
<td>g a l t e d r s m e i g o a n e m m</td>
<td>p s c d m o s i m i i n o m e m n o</td>
</tr>
<tr>
<td>e r n i n i s c a l e h i a b t r a</td>
<td>o a a m e e s m e e n o h c s n m h</td>
<td></td>
</tr>
</tbody>
</table>
whole number  time zone  scale
degree   dimensions  data
similar   parentheses  protractor
Encoding Activity Page

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

da_______________

whole ______________ber

deg_______________

si________________lar

paren________________es
Encoding Activity Page

__________________ale

di________________sions

pro______________tor

time_______________ne

ta men

trac zo
Have the students cut out the word halves and glue them together to create the key words for this unit.
Encoding Activity Page

sc
dimen
protrac
time z
ta
lar
one
umber
Encoding Activity Page

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

ren  ses  the  pa

men  sions  di

trac  tor  pro
Encoding Activity Page

lar \hspace{0.5cm} mi \hspace{0.5cm} si

__________  __________  __________
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. Data show
   - ordered pairs of prime numbers.
   - the value of equivalent numbers.
   - collections of facts.
   - the commutative property.

2. A whole number has
   - no prime numbers.
   - no exponents.
   - no value.
   - no fractions.

3. These are used to measure angles:
   - ratios
   - estimates
   - degrees
   - composite numbers

4. When things are similar, they are
   - different in size.
   - different in shape.
   - different in the number of exponents they have.
   - average.

5. Another word for parentheses is
   - formula
   - bracket
   - ratio
   - numeral

6. Which of these words goes with scale?
   - ordered pair
   - variable
   - ratio
   - protractor
What’s the Answer?

7. Which of these would be a dimension of an object?
   - area
   - width
   - digit
   - variable

8. A protractor measures
   - the area of a surface.
   - data.
   - degrees in an angle.
   - exponents.

9. How many time zones are there around the world?
   - 12
   - 365
   - 24
   - 180
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Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1. Data show  
2. A whole number  
3. There are 360  
4. Shapes are similar  
5. Parentheses can be used to  
6. Scale shows the  
7. Height would be an example of  
8. A protractor is used to  
9. There are 24

A. degrees in a circle.  
B. ratio of the length in a drawing or object.  
C. a dimension.  
D. facts, such as measurements or values.  
E. time zones around the world.  
F. if their only difference is size.  
G. has no fractions.  
H. group things together.  
I. measure degrees in an angle.

1→___________  
2→___________  
3→___________  
4→___________  
5→___________  
6→___________  
7→___________  
8→___________  
9→___________
Reading Comprehension Activity Page

ANSWER KEY

1. Data show
2. A whole number
3. There are 360
4. Shapes are similar
5. Parentheses can be used to
6. Scale shows the
7. Height would be an example of
8. A protractor is used to
9. There are 24

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B. ratio of the length in a drawing or object.
C. a dimension.
D. facts, such as measurements or values.
E. time zones around the world.
F. if their only difference is size.
G. has no fractions.
H. group things together.
I. measure degrees in an angle.

1→ D  2→ G  3→ A  4→ F
5→ H  6→ B  7→ C  8→ I
9→ E
**Reading Comprehension Activity Page**

Cut out the words and glue them under their definitions.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Word</th>
<th>Definition</th>
<th>Word</th>
<th>Definition</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is when things are the same shape but different in size.</td>
<td>whole number</td>
<td>This is the ratio of length in a drawing or model.</td>
<td>data</td>
<td>This is the unit of measurement for angles.</td>
<td>similar</td>
</tr>
<tr>
<td>This is an instrument used to measure degrees.</td>
<td>degree</td>
<td>These are collections of facts.</td>
<td>dimensions</td>
<td>These can be used to group things together.</td>
<td></td>
</tr>
<tr>
<td>These numbers have no fractions.</td>
<td>parentheses</td>
<td>Alaska is in one of these.</td>
<td>protractor</td>
<td>This is the measurement of length, in one direction.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>scale</td>
<td></td>
<td>time zone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Sealaska Heritage Institute*
This is when things are the same shape but different in size.  

similar

This is the ratio of length in a drawing or model.  

scale

This is the unit of measurement for angles.  

degree

This is an instrument used to measure degrees.  

protractor

These are collections of facts.  

data

These can be used to group things together.  

parentheses

These numbers have no fractions.  

whole number

Alaska is in one of these.  

time zone

This is the measurement of length, in one direction.  

dimensions
STUDENT SUPPORT MATERIALS

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

d____t_____
____ole n____mbers
degr_______
si____lar
paren____ses
_____ale
di _____sions
______tractor
time _____ne
Have the students complete the writing of the key math words.

d___________________a
wh____________________r
de____________________e
si____________________r
pa____________________s
sc____________________e
di____________________s
pr____________________r
ti____________________e
Basic Writing Activity Page

Have the students write the word for each picture.

1. ()
2. Buttons
3. Protractor
4. Computer
5. Rubik's Cube
6. Right Triangle
Have the students write the word for each picture.
ACROSS
3 These are collections of facts.
4 This is the ratio of length in a drawing or model.
6 There are 24 of these.
7 These numbers have no fractions.
8 This is when things are the same shape but different in size.
9 These can be used to group things together.

DOWN
1 This is an instrument used to measure degrees.
2 This is the unit of measurement for angles.
5 This is the measurement of length, in one direction.
Crossword Puzzle Answers

PRO

DATA

SCALE

P R O  D

T H A

R D G

A I

C T I M E - Z O N E

T E

W H O L E - N U M B E R

R S

S I M I L A R

O

P A R E N T H E S E S
UNIT ASSESSMENT
MEASUREMENT

Unit Assessment Teacher’s Notes
Grade 7 • Unit 9
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 DATA.
2. Write the number 2 by the picture for WHOLE NUMBERS.
3. Write the number 3 by the picture for DEGREE.
4. Write the number 4 by the picture for SIMILAR.
5. Write the number 5 by the picture for PARENTHESES.
6. Write the number 6 by the picture for SCALE.
7. Write the number 7 by the picture for DIMENSIONS.
8. Write the number 8 by the picture for PROTRACTOR.
9. Write the number 9 by the picture for TIME ZONE.

SIGHT RECOGNITION
Turn to page 2 and 3 in your test. Look at the pictures in the boxes. Circle the word for each picture.

DECODING/ENCODING
Turn to page 4 and 5 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.
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.

READING COMPREHENSION
Turn to page 6 in your test. Write each word under its definition. Refer to Student Support Materials for answer key.

BASIC WRITING
Turn to page 7 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.
Date:___________      Student's Name:____________________

Number Correct:__________       Percent Correct:__________
<table>
<thead>
<tr>
<th>dimen</th>
<th>whole num</th>
</tr>
</thead>
<tbody>
<tr>
<td>da</td>
<td>da</td>
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<td></td>
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</tr>
</tbody>
</table>
This is when things are the same shape but different in size.

This is the ratio of length in a drawing or model.

This is the unit of measurement for angles.

This is an instrument used to measure degrees.

These are collections of facts.

These can be used to group things together.

These numbers have no fractions.

Alaska is in one of these.

This is the measurement of length, in one direction.

- data
- scale
- whole number
- similar

- degree
- parentheses
- dimensions
- protractor

- time zone
UNIT 10
Statistics
These Alaskan math standards underly the language development of the unit. Many of these standards are addressed during the regular math program and in the concrete introduction of the key vocabulary words for the unit.

The student demonstrates understanding of position and direction by:

[7] G-8 graphing or identifying values of variables on a coordinate grid (M5.3.6)

The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating or making predictions; or drawing or justifying conclusions) by:

[7] S&P-2 using information from a variety of displays (e.g., as found in graphical displays in newspapers and magazines) (M6.3.2)

[7] S&P-3 determining range, mean, median, or mode (M6.3.3)

The student demonstrates an ability to problem solve by:

[7] PS-1 selecting, modifying, and applying a variety of problem-solving strategies (e.g., working backwards, drawing a picture, Venn diagrams and verifying the results) (M7.3.2)

[7] PS-2 evaluating, interpreting, and justifying solutions to problems (M7.3.3)

The student demonstrates an ability to classify and organize data by:

[7] S&P-1 [collecting, L] displaying, organizing, or explaining the classification of data in realworld problems (e.g., science or humanities, peers or community), using circle graphs, frequency distributions, stem and leaf, [or scatter plots L] with appropriate scale (M6.3.1)
Alaskan Language Standards (GLE’s) for This Unit

AK.R.3.1. Reading: The student uses strategies to decode or comprehend the meaning of words in texts. (E.B.1)

[7] 3.2.2. Reading aloud short factual information (e.g., reports, articles) (L)

AK.R.3.3. Reading: The student restates/summarizes and connects information. (E.B.3)

AK.R.3.5. Reading: The student follows written directions. (E.C.2)

[7] 3.5.1. Completing a task by following written, multi-step directions (e.g., answer a multi-faceted text question) (L)

[7] 3.5.2. Identifying the sequence of steps in a list of directions (e.g., what is the first step, what is the second step)

[7] 3.3.4. Applying rules of capitalization (e.g., titles and proper nouns)

AK.W.3.4. Writing: The student revises writing. (E.A.5, E.A.8)

AK.E.A. A student should be able to speak and write well for a variety of purposes and audiences. A student who meets the content standard should:

E.A.1. Apply elements of effective writing and speaking. These elements include ideas, organization, vocabulary, sentence structure, and personal style.

E.A.2. In writing, demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation.

E.A.3. In speaking, demonstrate skills in volume, intonation, and clarity.
INTRODUCTION OF MATH VOCABULARY
Measurement

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.

**COMBINATIONS**

Put sandwich ingredients on a table in front of the students. Have them determine if the order in which you put the sandwich ingredients together makes any difference. For example, does it matter if you put the cheese on and then the meat, or the meat and then the cheese? Lead the students to understand that in this case order is not important. Use this to introduce combinations in math (i.e. 2+3 or 3+2).

**LINE GRAPH**

Show the students a globe of the earth. Direct their attention to the lines of longitude and latitude. In particular, have them find their community and the nearest longitude/latitude lines near it. Use this to introduce a line graph to the students. Show examples of line graphs.

**MODE**

Place 10 or more food items that are the same on a table (i.e. candies, mini-bars, etc.). Add 2 or 3 different items to those on the table. Have the students identify the most frequent food item. Use this to introduce mode to the students.
Measurement

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.

**RANGE**

Give each student a small amount of trail mix. Each student should separate the ingredients of his portion. When this is done, they should count the number of each ingredient. Have them identify the smallest number and the greatest number of items. Use this to introduce range to the students.

**MEAN**

Put play money in a box and have five students reach into the box to get a handful of money. Each student should count his/her money. Write the five totals on the board; divide the total by five (for the five totals) to reach the mean in relation to the money. Repeat.

**MEDIAN**

Place a tray of soil on a table where the students can readily see it. Using your hands, create a 4 lane highway in the sand. When completed, draw the students’ attention to the land between the sets of lanes — the median. Use this to introduce median as a mathematical concept.
Measurement

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.

Mount a highway map of Alaska on the board. Tell the students that they are in a specific location, such as Haines. Have them suggest the route(s) that could be used to reach Fairbanks. Use this to introduce plotting a route on a map. Relate this to plotting on a graph.

Show the students the picture of the St. Louis Arch, from the end of this unit. Give a student a straw or other bendable item. The student should bend it to create an arch or parabola. Show the use of parabolas on graphs.

Mount a map of Europe on the board. Direct the students' attention to Germany and Italy. Use your finger to draw a line from one country to the next, creating a line of axis. Introduce these as two of the countries that made up the axis powers in World War II. Relate axis to lines of symmetry on a graph. Show examples.
COMBINATIONS
LINE GRAPH
MODE
RANGE
101

50 / ___ = ___

75

84
MEAN
3, 5, 7, 12, 13, 14, 21, 23
MEDIAN
AXIS
PARABOLA
(TO) PLOT
LANGUAGE ACTIVITIES
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.

Mini Pictures
Provide each student with a copy of the mini-pictures page from the Student Support Materials. When you say the key words, the students must find the pictures for them. Then, have the students cut out the pictures. Say the keywords and the students should hold up the pictures for them.

Number That Word
Mount the vocabulary graphics on the board. Provide each student with three blank flashcards. Each student should write the numbers 1, 2, and 3 on his/her cards - one number per card. Point to one of the vocabulary graphics. Then, say three vocabulary words. Each student should show the number card that matches the picture you pointed to. Repeat with other graphics and vocabulary words.

Back-to-Back Race
Have two pairs of students stand in the center of the classroom. The students in each pair should stand back-to-back with arms interlocked. Lay the vocabulary illustrations on the floor in a scattered form. Say one of the vocabulary words. The two pairs of students must then race to the illustration for the vocabulary word you said without unlocking their arms. The first pair to reach the correct illustration wins the round. Repeat with other pairs of students.

Airplane Land
Scatter the vocabulary pictures on the floor. Have the students sit in a large circle around the pictures. Prepare two paper airplanes. Give the airplanes to two students. Say one of the vocabulary words. The students should toss their airplanes, attempting to land them on the picture for the vocabulary word you said. Repeat until all students have participated.
Fanball
Tape the vocabulary pictures to the floor and group the students around them. Give a “hand fan” and an inflated balloon to two students. Say one of the vocabulary words. The two students should then use their fans to move the balloons to the picture that represents the vocabulary word you said. The first player to fan his/her balloon over the correct picture wins the round. Repeat.

Circle Hop
Scatter the vocabulary pictures on the floor. Using masking tape, make a circle around each picture. Have two or more students stand in the center of the classroom. Say one of the vocabulary words. The students should then hop to the circle which contains the picture that represents the vocabulary word you said. Then, remove the picture from the circle and say another vocabulary word. Continue until all the pictures have been removed from the floor. The students must remember where the graphics were in order to hop to the correct masking tape circles.
Language and Skills Development

SPEAKING

Illustration Build-Up
Mount the vocabulary illustrations on the chalkboard. Point to two of the illustrations. The students should then say the vocabulary words for those two illustrations. Then, point to another illustration. The students should repeat the first two vocabulary words and then say the vocabulary word for the third illustration you pointed to. Continue in this way until the students lose the sequence of words.

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.

Centered Speaker
Group the students into two teams of equal numbers. The two teams should stand, facing one another, about ten feet apart. Have one student stand between the two teams as IT for the first round of the activity. Give each player in Team One a number. Then, give each player in Team Two a number. The numbers you give the players should be “scattered” so that, for example, number One in each team is not directly opposite one another. Call a number. The two players from the teams who have that number must then exchange places as quickly as possible. However, IT must attempt to reach one of the vacated positions before the other player arrives. The player who is “stuck in the middle” becomes IT, and must then identify a vocabulary picture that you show him/her. To add spice to this activity, all students in each team may pretend to run when you call a number. In this way, IT will not be as certain as to which players are exchanging places. Repeat until many students have identified vocabulary pictures.
Language and Skills Development

**Stick of Chance**
Before the activity begins, obtain four or five popsicle sticks. Break the popsicle sticks into different lengths. Hold the popsicle sticks in your hands so that they all appear to be the same length. Have individual students remove the sticks from your hands. The “winner” is the student who receives the longest stick; he/she must then identify a vocabulary picture you point to, or repeat a sentence that you said at the beginning of the round. Repeat this process until many students have responded in this way.

**Half Match**
Before the lesson begins, prepare a photocopy of each of the vocabulary pictures. Cut each of the photocopied pictures in half. Give the picture halves to the students (a student may have more than one picture half). Say one of the vocabulary words. The two students who have the halves of the picture for that word must show their halves and repeat the word orally. Continue in this way until all of the vocabulary words have been reviewed. This activity may be repeated more than once by collecting, mixing, and redistributing the picture halves to the students. This activity may also be adapted for team form. To do this, cut each of the vocabulary pictures in half. Place half of the pictures in one pile and the other halves in another pile (one pile for each team). Say a vocabulary word. When you say “Go,” the first player from each team must rush to his/her pile of picture halves. Each player must find the half of the picture for the vocabulary word you said. The first player to correctly identify the picture half and to repeat the vocabulary word for it wins the round. Repeat until all players have played.
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.

**Sight Recognition**

**Funnel Words**
Group the students into two teams. Give the first player in each team a funnel. Mount the sight words on the walls, board, and windows, around the classroom. Say one of the sight words. The students with the funnels must then look through them to locate the sight word you named. The first student to do this correctly wins the round. Repeat with other pairs of students until all players in each team have played.

**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.

**Student Support Materials**
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

**Decoding/Encoding**

**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.
Flashlight Encode
Cut each of the sight words in half. Mount all of the word halves in a scattered form on the chalkboard. Stand in front of the chalkboard with two flashlights. Shine the light of one flashlight on a word half. Then, shine the light of the other flashlight on its matching half. The students should say the sight word. However, when the lights of the two flashlights are shining on word halves that do not go together, the students should remain silent. If four flashlights are available, this activity may be done in team form. In this case, give the first player in each team two flashlights. Say a sight word. The first player in each team must then use his/her two flashlights to illuminate the word halves for the sight word you said. The first player to do this correctly wins the round.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Reading Comprehension

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.
Language and Skills Development

WRITING

Say Again
Group the students into two teams. Whisper a sight word to the first player in each team. When you say “Go,” the first player in each team must whisper the same sight word to the next player in the team. The students should continue in this way until the last player in the team hears the sight word. When the last player in the team hears the sight word, he/she must rush to the chalkboard and write the word on the board. The first team to do this correctly wins the round. Repeat until each player has written a sight word in this way.

Numbered Pictures
Mount the vocabulary pictures on the chalkboard and number each one. Provide each student with writing paper and a pen. Call the number of a picture. Each student should write the vocabulary word for the picture represented by that number. Repeat until all vocabulary words have been written. Review the students’ responses.

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.

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).
Language and Skills Development

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.

Student Support Materials
Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, 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.

1. 1 2 3 4 4 5 6 7 8 9

2. 7
   3
   9
   6
   4

3. 101
   50 \[_/\]=[__]

4. 3, 5, 7, 12, 13, 14, 21, 23

5. 75
   84
STUDENT SUPPORT MATERIALS

Sight Words
combinations
line graph
axis
range
mean
parabola
mode
median
plot
STUDENT SUPPORT MATERIALS

Reading  •  Sight Recognition
### Sight Words Activity Page

Have the students circle the word for each picture.

| 3, 5, 7, 12, 13, 14, 21, 23 | combinations  
| line graph  
| axis  
| range  
| mean  
| median  
| mode  
| parabola  
| plot  |

| 1, 2, 3, 4, 4, 5, 6, 7, 8, 9  
| combinations  
| line graph  
| axis  
| range  
| mean  
| median  
| mode  
| parabola  
| plot  |

| combinations  
| line graph  
| axis  
| range  
| mean  
| median  
| mode  
| parabola  
| plot  |

| combinations  
| line graph  
| axis  
| range  
| mean  
| median  
| mode  
| parabola  
| plot  |

| combinations  
| line graph  
| axis  
| range  
| mean  
| median  
| mode  
| parabola  
| plot  |

| combinations  
| line graph  
| axis  
| range  
| mean  
| median  
| mode  
| parabola  
| plot  |
Sight Words Activity Page

combinations
line graph
axis
range
mean
median
mode
parabola
plot

combinations
line graph
axis
range
mean
median
mode
parabola
plot

7
3
9
6
4
Sight Words Activity Page

Write the numbers on their correct vocabulary graphics.

1. combination
2. line graph
3. axis
4. range
5. mean
6. median
7. mode
8. parabola
9. plot
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.

combinations
plot
parabola

mean
mode
median

line graph
axis
range

Name Date

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

912  Sealaska Heritage Institute
Sight Words Activity Page

ANSWER KEY

combinations  
plot  
parabola

mean  
mode  
median

line graph  
axis  
range

g p a n b o o n a t  a x i s n n x i
m n n t p a r a b o l a  a a o l h b
i o r r t m t h a a g d o g d i m t
h e a h o a i e x t s i x c o n p l
t t l i n e g r a p h p m e i o l l
l a i c o m b i n a t i o n s  r a n g e c e o i
i m a n c o m b i n a t i g i a d a
n a e g s g g  p l o t  o g a a r a b
l a i c o m b i n a t i o n s  e s t
a a b x n e p a r a b o l o n i e c
p o a o t g h o m x r c a m b d t e
s s l n g e a  m o d e n o g s e e s
p m  m e a n  e r e b i i n l s n g m
b a e g a a i a n a c a a l m a m r
a t e o l a x e i l a l s d i a d s
i p e x n a p o n n  m e d i a n a e
o t a d l i n e a n a i l r e i p n
n a o e p i a l i n e g r a r o e d
b n o o e d c e a a r e x m n g m o
STUDENT SUPPORT MATERIALS

Reading • Encoding
Encoding Activity Page

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

______________binations

line gra _____________

ax__________________

ran__________________

m____________________n

<table>
<thead>
<tr>
<th>is</th>
<th>ge</th>
<th>od</th>
</tr>
</thead>
<tbody>
<tr>
<td>ia</td>
<td>bo</td>
<td></td>
</tr>
</tbody>
</table>
Encoding Activity Page

med________________n
m________________e
para_______________la
________________ot

ea | com
pl | ph
Encoding Activity Page

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

- combi
- is
- line gr
- ot
- ax
- nations
- ran
- an
- me
- de
<table>
<thead>
<tr>
<th>medi</th>
<th>bola</th>
</tr>
</thead>
<tbody>
<tr>
<td>mo</td>
<td>aph</td>
</tr>
<tr>
<td>para</td>
<td>ge</td>
</tr>
<tr>
<td>pl</td>
<td>an</td>
</tr>
</tbody>
</table>
Encoding Activity Page

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

bi tions com na

di an me

ra la pa bo
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. Combinations are collections of things in which
   - order is very important.
   - all things are congruent.
   - all angles are right angles.
   - order is not important.

2. Line graphs compare
   - equivalent variables.
   - exponents of whole numbers.
   - two variables.
   - values of vertices.

3. An axis is a
   - diameter of a perimeter.
   - line of symmetry for a graph.
   - prism.
   - polyhedron.

4. A range is the difference between
   - the lowest and highest values.
   - the mean value.
   - dilation and a perimeter.
   - addends.

5. Another word for mean is
   - range.
   - average.
   - radius.
   - formula.

6. The median is the
   - dilation of shapes over time.
   - middle value in a list of numbers.
   - the center of a circle’s radius.
   - the center of a circle.
What’s the Answer?

7. The mode is the number that can be seen in
   - a polygon.
   - a polyhedron.
   - a ratio.
   - a list of numbers.

8. A parabola is shaped like an
   - expression.
   - edge.
   - arch.
   - isosceles triangle.

9. When we plot, we can use
   - a graph or map.
   - the product of addends in a trapezoid.
   - dilation.
   - parentheses and irregular polygons.
1. Combinations are collections of things in which
   - order is very important.
   - all things are congruent.
   - all angles are right angles.
   - order is not important.

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9. When we plot, we can use
   - a graph or map.
   - the product of addends in a trapezoid.
   - dilation.
   - parentheses and irregular polygons.
Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1. In combinations, __________ 2. A line graph plots two variables and __________ 3. An axis is __________ 4. The difference between the lowest __________ 5. The mean is the same __________ 6. To find the median, your numbers __________ 7. The mode is the number that __________ 8. The parabola is a __________ 9. A person can plot values __________

A. and highest values is the range. B. a line on a graph. C. as the average. D. shows up most in a list of numbers. E. the order of things is not important. F. on a map or graph. G. each one is plotted along an axis. H. have to be in order. I. shape like an arch.
Reading Comprehension Activity Page

ANSWER KEY

1. In combinations, __________ and highest values is the range.

2. A line graph plots two variables and __________ a line on a graph.

3. An axis is __________ as the average.

4. The difference between the lowest __________ shows up most in a list of numbers.

5. The mean is the same __________ the order of things is not important.

6. To find the median, your numbers __________ on a map or graph.

7. The mode is the number that __________ each one is plotted along an axis.

8. The parabola is a __________ have to be in order.

9. A person can plot values __________ shape like an arch.

1→ E  2→ G  3→ B  4→ A
5→ C  6→ H  7→ D  8→ I
9→ F
Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.

This is the difference between the lowest and highest values.

In these, the order of things is not important.

This is the middle value in a list of numbers.

This compares two variables using an axis for each one.

This is the number that appears most in a list of numbers.

This is a line of symmetry for a graph.

We can do this on graphs and maps.

This is another way of saying average.

This is a shape that is sometimes used over a doorway.

combinations  line graph  axis  range
mean  median  mode
parabola  plot
This is the difference between the lowest and highest values.

In these, the order of things is not important.

This is the middle value in a list of numbers.

range

combinations

median

This compares two variables using an axis for each one.

This is the number that appears most in a list of numbers.

This is a line of symmetry for a graph.

line graph

mode

axis

We can do this on graphs and maps.

This is another way of saying average.

This is a shape that is sometimes used over a doorway.

plot

mean

parabola
STUDENT SUPPORT MATERIALS

Writing
Writing Activity Page

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

com______nation
line gra_______
ax_________
ran_______
m_______n
me ________n
m________e
para_______la
pl_________
Have the students complete the writing of the key math words.

co__________________________n
l___________________________ph
a__________________________s
r___________________________e
m__________________________n
pl____________________________
 m____________________________ an
m____________________________ e
pa____________________________ a
Basic Writing Activity Page

Have the students write the word for each picture.

1234456789

7 3 9 6 4

3, 5, 7, 12, 13, 14, 21, 23
Basic Writing Activity Page

Have the students write the word for each picture.
Crossword Puzzle

ACROSS
1  We can do this on graphs and maps.
5  In these, the order of things is not important.
6  This is the middle value in a list of numbers.
7  This compares two variables using an axis for each one.

DOWN
1  This is a shape that is an arch.
2  This is another way of saying "average."
3  This is a line of symmetry for a graph.
4  This is the difference between the lowest and highest values.
6  This is the number that appears most in a list of numbers.
Crossword Puzzle Answers

Solution:
P   L   O   T
A   R   A   M
R   A   X   E
A   R   A
C   O   M   B   I   N   A   T   I   O   N   S
O   N   S
L   G
A   M   D   I   A   N
O
D
L   I   N   E   -   G   R   A   P   H
UNIT ASSESSMENT
Statistics

Unit Assessment Teacher’s Notes
Grade 7  ●  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 **COMBINATIONS**.
2. Write the number 2 by the picture for **LINE GRAPH**.
3. Write the number 3 by the picture for **AXIS**.
4. Write the number 4 by the picture for **RANGE**.
5. Write the number 5 by the picture for **MEAN**.
6. Write the number 6 by the picture for **MEDIAN**.
7. Write the number 7 by the picture for **MODE**.
8. Write the number 8 by the picture for **PARABOLA**.
9. Write the number 9 by the picture for **PLOT**.

**SIGHT RECOGNITION**

Turn to page 2 and 3 in your test. Look at the pictures in the boxes. Circle the word for each picture.

**DECODING/ENCODING**

Turn to page 4 and 5 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.
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.

READING COMPREHENSION
Turn to page 6 in your test. Write each word under its definition. Refer to Student Support Materials for answer key.

BASIC WRITING
Turn to page 7 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.
<table>
<thead>
<tr>
<th><strong>This is the difference</strong></th>
<th><strong>In these, the order of</strong></th>
<th><strong>This is the middle</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>between the lowest and highest values.</td>
<td>things is not important.</td>
<td>value in a list of numbers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>This compares two</strong></th>
<th><strong>This is the number</strong></th>
<th><strong>This is a line of</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>variables using an axis for each one.</td>
<td>that appears most in a list of numbers.</td>
<td>symmetry for a graph.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>We can do this on</strong></th>
<th><strong>This is another way</strong></th>
<th><strong>This is a shape that</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>graphs and maps.</td>
<td>of saying average.</td>
<td>is sometimes used over a doorway.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>combinations</th>
<th>line graph</th>
<th>median</th>
<th>axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>mean</td>
<td>range</td>
<td>parabola</td>
</tr>
</tbody>
</table>

| mode |
1234456789

101
50 ___ / ___ = ___
75
84

3, 5, 7, 12, 13, 14, 21, 23

7
Glossary

A

**Actual**
Something that is real and not just imagined.

**Acute**
A triangle for which all interior angles are acute – less than 90 degrees.

**Addends**
Any of the numbers that are added together. Example: In $2 + 3 = 5$, the 2 and the 3 are addends.

**Additive (inverse)**
The number you add to another number to get zero. The negative of a number. For example: The additive inverse of $-5$ is 5, because $-5 + 5 = 0$. Also the additive inverse of 5 is $-5$.

**Affected**
Acted upon; influenced. Numbers can be affected in a variety of ways, e.g through computation.

**Approximately**
Almost exact or correct

**Area**
The size of a surface. The amount of space inside the boundary of a flat (2-dimensional) object such as a triangle or circle.

**Arrange**
To place in proper, desired, or convenient order; adjust properly:

**Average**
The average could be any single number that represents the center of a set of values.
Axis
A line of symmetry for a graph. The two sides of a graph on either side of the axis of symmetry look like mirror images of each other.
An axis is also a reference line drawn on a graph (you can measure from it to find values).

C

Calculate
To solve (one or more problems) by a mathematical procedure; compute.

Circumference
The distance around the edge of a circle (or any curvy shape).

Combinations
A collection of things, in which the order does not matter.

Commutative
Is the Law that says you can swap numbers around and still get the same answer when you add or when you multiply.

Examples:
You can swap when you add: $3 + 6 = 6 + 3$
You can swap when you multiply: $2 \times 4 = 4 \times 2$

Complete
Having all parts or elements; lacking nothing.

Composite
A Composite Number can be divided evenly by numbers other than 1 or itself. Example: 9 can be divided evenly by 1, 3 and 9, so 9 is a composite number.
Glossary

Congruent
Exactly equal in size and shape. Congruent sides or segments have the exact same length. Congruent angles have the exact same measure. For any set of congruent geometric figures, corresponding sides, angles, faces, etc. are congruent.

Consider
Think carefully about (something), typically before making a decision.

D

Data
A collection of facts, such as values or measurements.

Decimal
The numbers we use in everyday life are decimal numbers, because there are 10 of them (0,1,2,3,4,5,6,7,8 and 9). Often “decimal number” is also used to mean a number that uses a decimal point followed by digits as a way of showing values less than one.

Example: 1.9 is a decimal number (one and nine tenths)

Degree
A unit of angle measure equal to $\frac{1}{360}$ of a complete revolution. There are 360 degrees in a circle. Degrees are indicated by the ° symbol, so 35° means 35 degrees.

Describe
Give an account in words of (someone or something), including all the relevant characteristics, qualities, or events.

Determine
To find out or come to a decision about by investigation, reasoning, or calculation.
Glossary

Diagonal
A straight line inside a shape that goes from one corner to another (but not an edge). So, if you join two vertices of a polygon which are not already joined by an edge, you get a diagonal.

Diameter
A straight line going through the center of a circle connecting two points on the circumference.

Digit
A symbol used to make numerals. 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are the ten digits we use in everyday numbers. Example: the numeral 153 is made up of 3 digits ("1", "5" and "3").

Dilation (of scale)
A transformation in which a figure grows larger. Dilations may be with respect to a point (dilation of a geometric figure) or with respect to the axis of a graph (dilation of a graph). Some school textbooks erroneously use the word dilation to refer to all transformations in which the figure changes size, whether the figure becomes larger or smaller. Unfortunately the English language has no word that refers collectively to both stretching and shrinking.

Dimensions
A measurement of length in one direction. Examples: width, depth and height are dimensions.

Display
To present or hold up to view.

Divisible
Capable of being divided, usually with no remainder.

E

Edge
The line where two surfaces meet. It can also be the boundary of a shape, such as the circumference of a circle.
**Glossary**

**End Points**
Either of two points marking the end of a line segment.

**Equilateral**
A triangle with three congruent sides.

**Equivalent**
Something that is essentially equal to another.

**Estimate**
A close guess of the actual value, usually with some thought or calculation involved. Example: Alex estimated there were 10,000 sunflowers in the field by counting rows.

**Evaluate**
To calculate the value of. Example: Evaluate the cost of each pie if 3 pies cost $6. Answer: $2 each.

**Explain**
To make plain or comprehensible.

**Exponent**
The exponent of a number shows you how many times the number is to be used in a multiplication. It is written as a small number to the right and above the base number. In this example: \(8^2 = 8 \times 8 = 64\) (Another name for exponent is index or power)

**Expression**
Numbers, symbols and operations (such as + and \(\times\)) grouped together that show the value of something. Example \(2\times3\) is an expression.

**Extend**
To stretch or spread (something) out to greater or fullest length.
Glossary

F

Formula
Numbers and symbols that show how to work something out. For example, the formula for finding the volume of a box is “V = w × d × h” (V stands for volume, w for width, d for depth and h for height. If w=4, d=5 and h=10, then V = 4×5×10 = 200.) It is a special type of equation that shows the relationship between different variables.

Function
A function is a special relationship between values: Each of its input values gives back exactly one output value. It is often written as “f(x)” where x is the value you give it. Example: f(x) = x/2 (“f of x is x divided by 2”) is a function, because for every value of “x” you get another value “x/2”. So:
* f(2) = 1
* f(16) = 8
* f(-10) = -5

G

Greatest (common factor- GCF)
The highest number that divides exactly into two or more numbers. If you find all the factors of two or more numbers, and you find some factors are the same (“common”), then the largest of those common factors is the Greatest Common Factor. Example: the GCF of 12 and 30 is 6, because 1, 2, 3 and 6 are factors of both 12 and 30, and 6 is the greatest.

I

Illustrate
To clarify, as by use of examples or comparisons.

Integers
All positive and negative whole numbers (including zero).
Glossary

Inverse
Opposite in effect. The reverse of. The inverse of adding 9 is subtracting 9. The inverse of multiplying by 5 is dividing by 5.

Irregular (polygon)
A polygon that does not have all sides equal and all angles equal. A polygon is “regular” only if all angles are equal and all sides are equal otherwise it is irregular.

Isosceles
A triangle with two sides that are the same length.

Least (common multiple)
A common multiple is a number that is a multiple of two or more numbers. The common multiples of 3 and 4 are 0, 12, 24, .... The least common multiple (LCM) of two numbers is the smallest number (not zero) that is a multiple of both.

Line graph
Line graphs compare two variables. Each variable is plotted along an axis. A line graph has a vertical axis and a horizontal axis.

Matrix
A matrix (plural matrices, or less commonly matrixes) is a rectangular array of numbers, symbols, or expressions. The individual items in a matrix are called its elements or entries. An example of a matrix with six elements is

\[
\begin{bmatrix}
1 & 9 & 13 \\
20 & 55 & 6
\end{bmatrix}
\]

Matrices of the same size can be added or subtracted element by element.
**Glossary**

**Mean**
Another word for average. To find the mean, you add up all the numbers and then divide by the number of numbers.

**Median**
The “median” is the “middle” value in a list of numbers. To find the median, your numbers have to be listed in numerical order.

**Mode**
The “mode” is the number that occurs most often in a list of numbers. If no number is repeated, then there is no mode for the list.

**Models**
Models represent patterns found in graphs and/or data.

**Multiplicative (property)**
The product of any number and one is that number. For example 5 x 1 = 5.

**N**

**Numeral**
A symbol or name that stands for a number. Examples: 3, 49 and twelve are all numerals.

**O**

**Obtuse (triangle)**
A triangle which has an obtuse angle as one of its interior angles. An obtuse angle has measure more than 90° and less than 180°.

**Ordered Pair**
Two numbers written in a certain order. Usually written in parentheses like this: (4,5)
Glossary

Can be used to show the position on a graph, where the “x” (horizontal) value is first, and the “y” (vertical) value is second.

P

Parabola
A special curve, shaped like an arch.

Parallel
Lines on a plane that never meet. They are always the same distance apart.

Parentheses
Parentheses or “round brackets” are the familiar ( ) symbols used in pairs to group things together. For example, \((3 + 2) \times (6 - 4) = 5 \times 2 = 10\)

Pattern
Things that are arranged following a rule or rules. Example: there is a pattern in these numbers: 2, 7, 12, 17, 22, … The rule is “start at 2 and add 5 each time”

Percent
Percent means parts per 100. The symbol is %. Example: 25% means 25 per 100

Perimeter
The distance around a two-dimensional shape. The perimeter of a circle is called the circumference.

(To) Plot
To draw on a graph or map.

Polygon
A plane shape (two-dimensional) with straight sides, such as triangles, rectangles and pentagons. A circle is not a polygon because it has a curved side).
Glossary

Polyhedron
A solid with flat faces (from Greek poly- meaning “many” and -edron meaning “face”), such as pyramids and prisms.
Each flat surface (or “face”) is a polygon.

Prime
A Prime Number can be divided evenly only by 1 or itself and it must be greater than 1. For example, 7 can be divided evenly only by 1 or 7, so it is a prime number.

Product
The answer when two or more numbers are multiplied together.

Property
An attribute or character that something has, such as color, height, weight, etc.

Protractor
An instrument used in measuring or drawing angles.

Pyramid
A solid object where the base is a polygon (a straight-sided flat shape) and the sides are triangles which meet at the top (the apex).

Q

Quadrant
A quarter of a circle (made by two radiuses at right angles and the connecting arc).

Quadrilateral
A flat shape with four straight sides.
Glossary

R

Radius
The distance from the center to the edge of a circle - it is half of the circle’s diameter.

Range
The difference between the lowest and highest values. In \{4, 6, 9, 3, 7\} the lowest value is 3, and the highest is 9, so the range is $9 - 3 = 6$.

Ratio
A ratio shows the relative sizes of two or more values. Ratios can be shown in different ways. Using the “:” to separate example values, or as a single number by dividing one value by the total.
Example: if there is 1 boy and 3 girls you could write the ratio as:
1:3 (for every one boy there are 3 girls)

Rectangular (prism)
A solid (3-dimensional) object which has six faces that are rectangles. It is a prism because it has the same cross-section along a length.

Regular (polygon)
If all angles are equal and all sides are equal, then it is a regular polygon (otherwise it is “irregular”).

Respond
To make a reply; answer.

Right angled (triangle)
A triangle that has a right angle ($90^\circ$)

Rounding
Rounding means reducing the digits in a number while trying to keep its value similar. The result is less accurate, but easier to use.
Glossary

Rules
The rules of mathematics are designed so everyone gets the same answer to a problem. Rules are based on basic properties of numbers and the four operations—addition, subtraction, multiplication and division.

S

Scale
The ratio of the length in a drawing (or model) to the length of the real thing—for example, in a drawing anything with the size of “1” might have a size of “10” in the real world, so a measurement of 150mm on the drawing would be 1500mm on the real item.

Scalene
A triangle with all sides of different lengths and no sides are equal and no angles are equal.

Select
To take as a choice from among several; to pick out.

Similar
In Geometry, two shapes are similar if the only difference is size (and possibly the need to turn or flip one around).

Solve
To work out a correct solution to a problem.

Sum
The result of adding two or more numbers.

Symmetry
Symmetry is when one shape becomes exactly like another if you flip, slide or turn it. The simplest type of symmetry is “reflection” (or “mirror”) symmetry.
Glossary

T

Terms
In algebra a term is either a single number or a variable, or numbers and variables multiplied together.

Time zones
The time in any of 24 time zones, usually the mean solar time at the central meridian of each zone. In the continental United States, there are four standard time zones: Eastern, using the 75th meridian; Central, using the 90th meridian; Mountain, using the 105th meridian; and Pacific, using the 120th meridian. The Alaskan time zone is at 135°W and used throughout Alaska except for the western Aleutian Islands. Also called Alaska Time.

Trapezoid
A trapezoid is a quadrilateral with one pair of opposite sides parallel. It is not a parallelogram because only one pair of sides is parallel. It is called a regular trapezoid if the sides that aren’t parallel are equal in length and both angles coming from a parallel side are equal.

Triangular Prism
A solid object that has two identical ends and all flat sides. The cross section is the same all along its length. The shapes of the ends give the prism the name “triangular prism” because it has triangular ends. It is a polyhedron.

U

Units
How many ones. How many single items. Used to show the “ones” place value (units, tens, hundreds, etc). For example, 27 has two tens and 7 units.

V

Value
The result or ‘output’ of a calculation – for example: 3 × 4 gives the value of 12.
Glossary

Variable
A symbol for a number we don't know yet. It is usually a letter like x or y. For example: in \( x + 2 = 6 \), \( x \) is the variable.

Variety
A number or collection of varied things, especially of a particular group; an assortment.

Vertex/Vertices
A point where two or more straight lines meet. For example, a corner of a polygon (2D) or of a polyhedron (3D).

Whole Numbers
The numbers \{0, 1, 2, 3, ...\} etc. There is no fractional or decimal part. And no negatives. For example: 5, 49 and 980 are all whole numbers.