

LESSON PLAN (Linda Bolin)

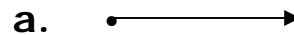
Lesson Title: Identifying and Classifying Figures in Plane Geometry	
Course: Math 7	Date: February Lesson 1
Utah State Core Content and Process Standards: 3.1a,b,d,e,f, 4.2b	
Lesson Objective(s): Students will be able to use information about points, lines, segments and rays to identify and classify angles, triangles, quadrilaterals and other polygons	
Enduring Understanding (Big Ideas): Geometric figures can be identified by their characteristics.	Essential Questions: <ul style="list-style-type: none"> • Where are examples of lines, segments and rays found in the real-world? How do endpoints differ from other points? • What units of measurement are appropriate for measuring angles? When is an angle considered to be a right angle? An acute angle? An obtuse angle? • How is information about angles and sides used to classify triangles? Quadrilaterals? Other two-dimensional shapes?
Skill Focus: Identify and classify geometric figures using information about their characteristics	Vocabulary Focus: Point, line, line segment, ray, parallel lines, perpendicular lines, intersecting lines, Angle, vertex, degree, protractor, acute, right, obtuse, congruent, scalene, isosceles, equilateral, sides, quadrilateral, parallelogram, kite, square, rectangle, rhombus, trapezoid, pentagon, hexagon, decagon
Materials: Worksheets: Geometry Words Journal page, Vocabulary For Two-Dimensional Words, Classifying Triangles, Classifying Quadrilaterals,	
Assessment (Traditional/Authentic): performance task, assignments, observation, questions	
Ways to Gain/Maintain Attention (Primacy): writing, small group discussion, sketching, music, movement, journaling, comparing, choice board	
Written Assignment: Geometry Words Journal Pages, Tic Tac Toe angle measures, Vocabulary For Two-Dimensional Words, Classifying Triangles, Classifying Quadrilaterals,	

Content Chunks

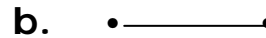
Post all vocabulary using a mind map to help students connect the words to their meaning.

Starter: How great is your memory from your past experiences? Try to match each word to the correct picture.

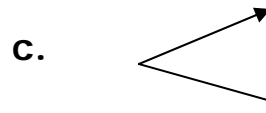
1. Point



2. Line segment



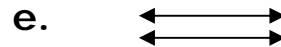
3. Line



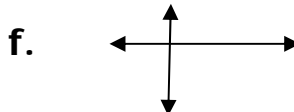
4. Ray



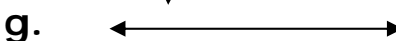
5. Parallel lines



6. Perpendicular lines



7. Angle



Lesson Segment 1: Where are examples of lines, segments and rays found in the real-world? How do endpoints differ from other points?

As you discuss the starter with the students, have them begin to fill in the Geometry Words journal page (attached). Assign each team of students one idea from the journal page to consider three real-world examples or situations. Select one person from each team to share the examples, so the class can choose one of those to write on their journal page. As you discuss the ideas, have students fill in their own words and sketches.

Lesson Segment 2: What units of measurement are appropriate for measuring angles? When is an angle considered to be a right angle? An acute angle? An obtuse angle?

Give each team of students a Classifying Angles paper. Students should cut out each angle, then sort the angles. (see attached page)

After students have sorted, select a few students to describe their categories. Discuss right, acute and obtuse. Sing the attached song about angle classifying using arms to demonstrate examples of each angle.

Demonstrate how to measure angles using a protractor. Have students divide the cut out angles amongst their team mates, so each person has three or four angles to measure. Students should measure the angles, write the degrees on the angle card, and share their measures with the team. If the team members are not sure they are being given the correct measures, they need to check using the protractor.

Play Tic Tac Toe to record these measures as follows.

Game: Tic Tac Toe

Have students arrange the measures of one of the right angle and 8 of the other angles in the nine sections of a Tic Tac Toe game and write whether each is acute, right or obtuse in the sections as well. Read the measures and classifications randomly until a student gets three in a row.

Lesson Segment 3: How is information about angles and sides used to classify triangles? Quadrilaterals? Other two-dimensional shapes?

Sing the attached Polygon Family Side Pride Song with students to mobilize their background knowledge about the two dimensional shape you will be discussing. After singing the song, work with students to complete the Two-Dimensional Words journal pages. Be sure to mention number of sides, angle measures, congruent sides, parallel sides, perpendicular sides as appropriate for the shapes. Two worksheets have been attached for practice in identifying the triangles and the special quadrilaterals.

Assign students to do the top row in the choice board, and to choose any one of the other boxes in the board to demonstrate their understanding.

Geometry Ideas Choice Board

Look in the index of the textbooks for pages that include geometry ideas found on the Geometry Words pages. Choose any 10 items from any of those pages and answer these. (Ten items total)

Cut out pictures that suggest at least 10 of the ideas from the Geometry Words pages. Arrange them on a paper to make a collage of Geometry ideas.

Make a foldable for showing the types of special quadrilaterals, and another foldable for showing triangle classification

Write a story that includes 10 or more of the words from the Geometry Words pages.

Make a cartoon book using Geometry ideas. Include sketches and descriptions


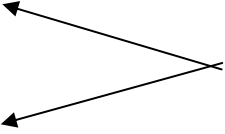
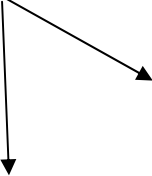
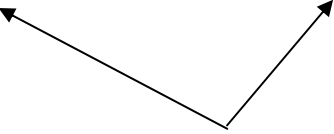

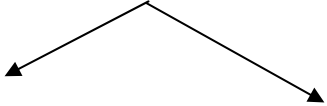
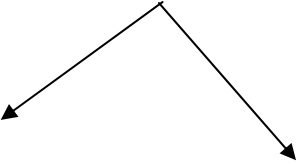
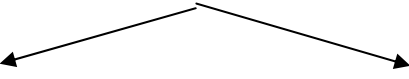
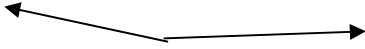
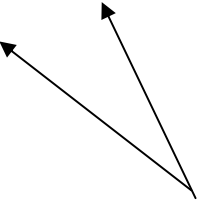
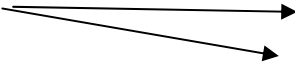
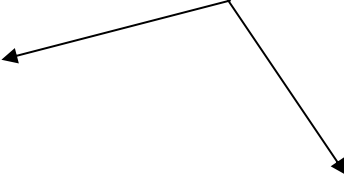
Geometry Words

Name: _____

Word or phrase Symbol ()	Sketch	A real-world example	Definition (in your words)
Point ()			
Line ()			
Line segment ()			
Ray ()			
Plane ()			
Parallel lines ()			
Perpendicular lines ()			
Congruent ()			
Angle () Acute Right Obtuse			
Vertex			
Degree			

Angle Sort

Cut the angle cards apart. Sort them into three categories and write the rule for each category. Your categories can't refer to angle positions such as up-side-down, left or right.

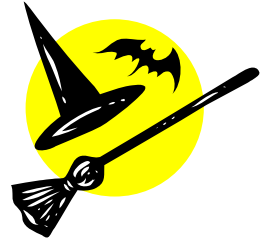
 <p>1</p>	 <p>2</p>	 <p>3</p>
 <p>4</p>	 <p>5</p>	 <p>6</p>
 <p>7</p>	 <p>8</p>	 <p>9</p>
 <p>10</p>	 <p>11</p>	 <p>12</p>

1) Once the angles have been sorted, measure each angle with the protractor and label the degrees on the card.

Classifying Angles Song

(to the of Skip To My Lou. Lyrics by Linda Bolin)
Use arms to show each as the verse is sung.

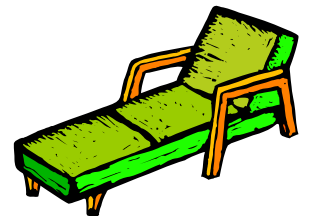
I'm a little angle. I like me like that.
An ACUTE little angle, and I'm not fat.
I'm an alligators mouth or a witches hat.
I'm ACUTE. I'm less than 90.



I'm a RIGHT angle, and I look square.
Look for a corner, and I'll be there.
I'm a flag or a present. I'm everywhere.
I'm just RIGHT. I'm exactly 90.



I'm rather large, so I have pride.
I'm an OBTUSE angle. I'm big inside.
I'm a reclining chair or a door open wide.
I'm OBTUSE. I am more than 90.



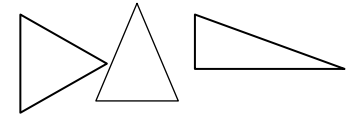
Polygon Family Pride

(Tune: Ten Little Indians. Lyrics by Linda Bolin)

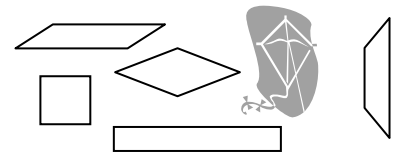
Meet our awesome polygon family.
All are closed to recognize easily.
We've no line segments crossed inside.
We have Polygon Family pride.



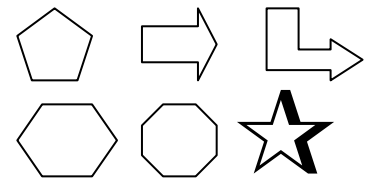
Our triangles are so much fun.
Congruent sides? Three, two, or none?
Equilateral, isosceles,
Or maybe *scalene* each of these.



Our Quadrilaterals are such a sight-
Parallelogram, rectangle or kite.
Square, rhombus, trapezoid-all these
Are four-sided if you please?



Our group called "Gons". They brag all night.
With more than four sides, they've got the right!
There are Pentas, Hexas, Heptas, Octas, Nonas too,
And Decagons in this crew.



You've met us all, and you know how to
Identify each. Count our sides now.
We really like showing off our sides.
That's our polygon family pride!

Name: _____

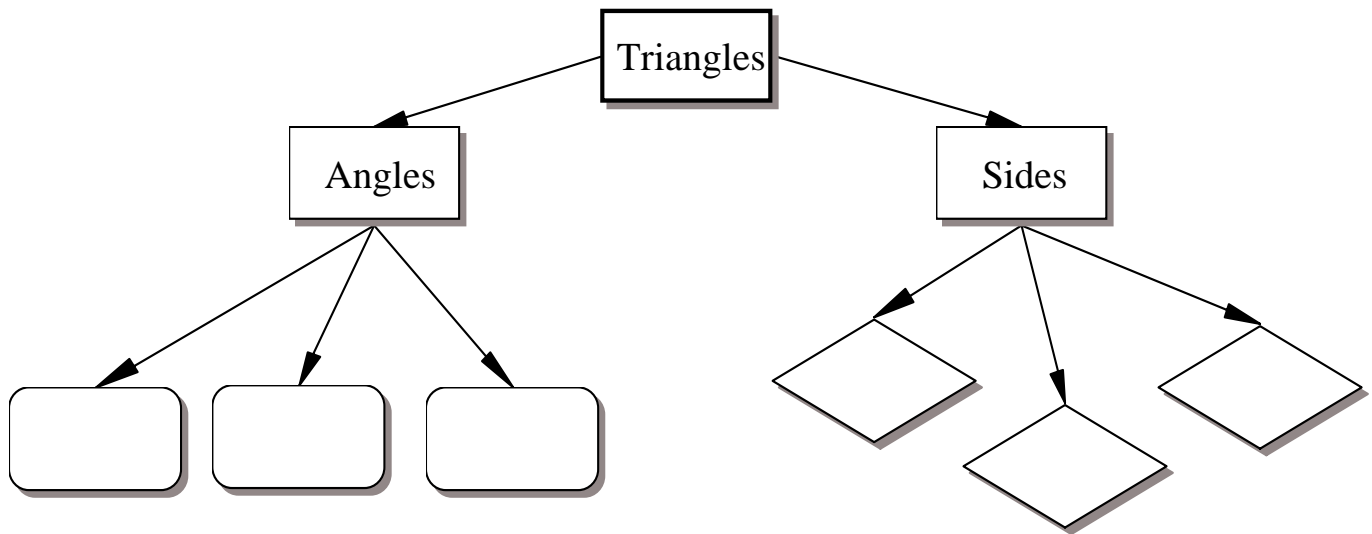
Vocabulary For Two-Dimensional Shapes

Word/phrase	Sketch or example	A real-world example	Definition (in your words)
Triangle:			
Equilateral			
Isosceles			
Scalene			
Acute			
Right			
Obtuse			
Quadrilateral:			
Parallelogram			
Square			
Rectangle			
Rhombus			
Trapezoid			
Kite			
Trapezium			

Word/phrase	Sketch or example	A real-world example	Definition (in your words)
Pentagon			
Hexagon			
Heptagon			
Octagon			
Nonagon			
Decagon			
Polygon			
Circle			
Diameter			
Radius			
Chord			
Pi π			

Triangle Classification

Name _____



1. Explain we mean when we say a triangle is *Right*? Sketch two examples.
2. Explain we mean when we say a triangle is *Obtuse*? Sketch two examples.
3. Explain we mean when we say a triangle is *Acute*? Sketch two examples.
4. Explain we mean when we say a triangle is *Isosceles*? Sketch two examples.
5. Explain we mean when we say a triangle is *Scalene*? Sketch two examples.
6. Explain we mean when we say a triangle is *Equilateral*? Sketch two examples.

Name each quadrilateral the most specific name. Inside each quadrilateral describe characteristics such as **angle measurement**, **length of the sides**, **whether sides are congruent**, **whether angles are congruent**, **whether opposite sides are parallel**.

