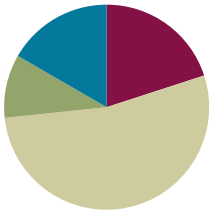
Lesson 1

Objective: Describe two-dimensional shapes based on attributes.

Suggested Lesson Structure



Fluency Practice	(12 minutes)
Application Problem	(6 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

Fluency Practice (12 minutes)

- Rename for the Larger Unit **2.NBT.1** (3 minutes)
- Sprint: Adding Across a Ten **2.OA.2** (9 minutes)

Rename for the Larger Unit (3 minutes)

Note: This fluency activity reviews place value foundations.

T: I'll tell you a number of ones. Make as many tens as you can, and then tell how many tens and ones. If there are no ones, only say the tens. Ready?
T: 10 ones.
S: 1 ten.
T: 30 ones.
S: 3 tens.
T: 41 ones.
S: 4 tens 1 one.

Continue with the following possible sequence: 50 ones, 54 ones, 80 ones, 85 ones, 99 ones, 100 ones, 105 ones, and 120 ones.

Sprint: Adding Across a Ten (9 minutes)

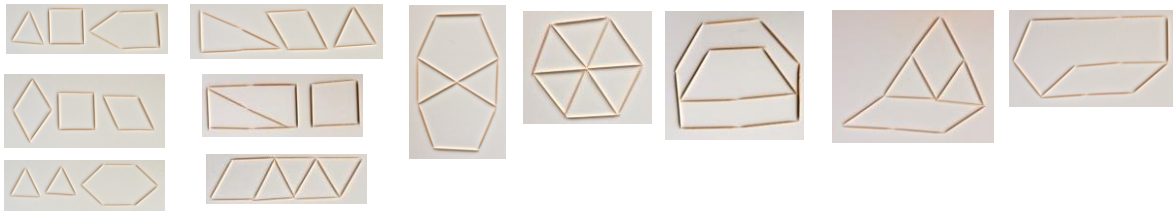
Materials: (S) Adding Across a Ten Sprint

Note: This Sprint gives practice with the grade level fluency of adding within 20 and applies it to larger numbers.

Application Problem (6 minutes)

Materials: (S) 12 toothpicks

Terrence is making shapes with 12 toothpicks. Using all of the toothpicks, create 3 different shapes he could make. How many other combinations can you find?



Note: This problem is designed to spark thought about the number of sides needed to produce different shapes. Encourage students to examine one another's work and expand their ideas about combination possibilities. Clarification may be necessary for students to explain that two or more toothpicks may be used to make one side.

Concept Development (32 minutes)

Materials: (T) Chart paper, marker, ruler (S) Personal white board, 1 rubber band, geoboard, 2 pencils

Display four empty charts labeled Chart 1, Chart 2, Chart 3, and Chart 4 on the board. Distribute one geoboard and rubber band per student. Note: These charts are used again in future lessons.

T: Let's look at this shape. (Draw a triangle on Chart 1 as shown at the top of the next page.) How would you describe this shape without using its name?

S: It has three sides. → It has three corners. → The sides are different lengths. → The sides are straight lines.

T: Good. If a figure has three corners, then it also has three **angles**. An angle is the figure formed where two sides meet. Watch as I mark the angles on the triangle. (Draw a semicircle to show the angles on the triangle.)

T: Use your geoboards to create a shape with three sides and three angles that looks different from mine. (Circulate to check for understanding.)

S: (Create a three-sided shape on the geoboard, illustrated on the next page.)

T: I'm going to record some of your shapes on Chart 1. (Use a ruler to draw three more shapes.)

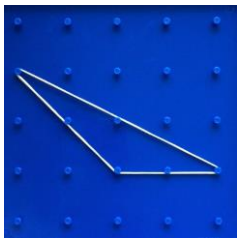
T: (Point to the shapes on Chart 1.) Although these shapes look different, all of them have some attributes, or characteristics, in common. What are they?

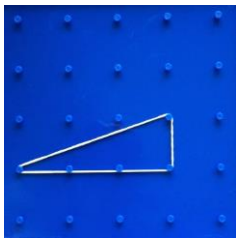
S: They all have three sides, three corners, and three angles. → They all are closed shapes. → They all have straight sides and no curves. → What is a closed shape?

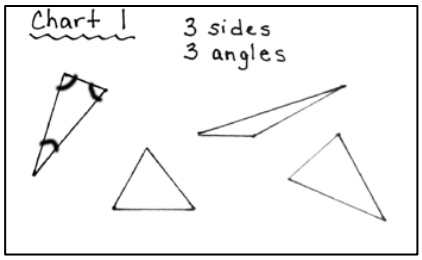
T: It means there are no gaps or overlaps between the straight sides. This shape is open. (Draw an open shape.)

T: All of these shapes have common attributes. They all have three straight sides and three angles.

T: (Write 3 sides and 3 angles at the top of Chart 1, as shown below.)







T: Now, let's look at another shape. (Draw a quadrilateral with a concave angle on Chart 2, as shown below.) How would you describe this shape without using its name?

S: It has four straight sides. → Some of the sides are different lengths. → It has four corners, so it must have four angles.

T: Yes! Is there an angle here? It looks different. (Point to the concave angle on the quadrilateral.)

S: There's a corner, so I think so. → Yes. I think of an angle like a mouth; this one opens on the outside.

T: You're right. It is an angle.

T: Let's count the angles. Put your finger next to the first angle you count, and continue counting the angles as you go around the shape. That way, you won't count the same angle twice. Count with me.

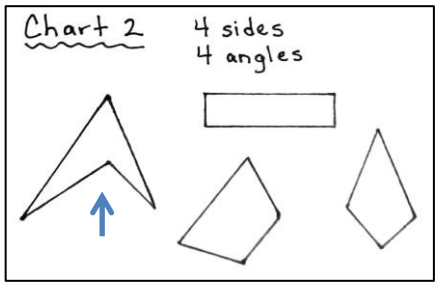
S: 1 angle, 2 angles, 3 angles, 4 angles.

T: Now, it's your turn. On your geoboard, create a shape with four sides and four angles that looks different from mine. (Circulate to check for understanding.)

S: (Create a four-sided shape, as shown to the right.)

T: I'm going to record some of your shapes on Chart 2. (Choose various quadrilaterals, such as rectangles of varied lengths, trapezoids, or parallelograms. Include shapes that cannot be easily named. See the image to the right.)

MP.6



T: (Point to the shapes on Chart 2.) Although these shapes look different, all of them have what attributes?

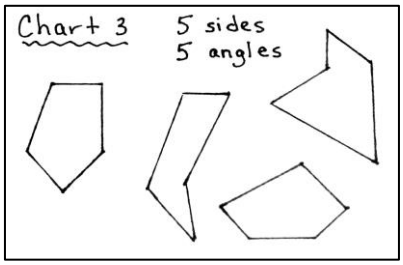
S: Four straight sides and four angles! → They are all closed! → They all have straight lines.

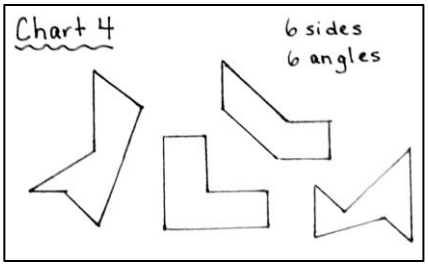
T: You're right. All of these shapes share attributes. (Write 4 sides and 4 angles at the top of Chart 2, as shown to the right.)

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Some students find visual discrimination challenging, particularly when they are not looking at the exemplars of a given shape. Provide encouragement to support students' perseverance. Invite students forward to circle the angles on each shape as a way to confirm the attributes discussed. Allow students to continue the use of this strategy on their Problem Sets.

Continue the above process for shapes with five sides and five angles (Chart 3) and six sides and six angles (Chart 4), as shown below. As the sides become more numerous, have the students mark the starting points of the counts by placing their fingers on the sides. Again, highlight many variations of the pentagon and hexagon, drawing attention to various angles.





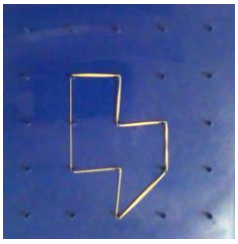
T: There are many shapes that have more than six sides or six angles. On your geoboards, see if you can make a shape with seven sides and seven angles. When I say, "Show me," hold up your board so I can see your shape. (Allow students time to work.)

T: Show me.

S: (Hold up a seven-sided shape, like the one shown to the right.)

T: Let's make sure we can count seven angles. Point and count on your shape with me. Ready?

S: (Point and count chorally.) 1 angle, 2 angles, …, 7 angles!



T: Now, let's make a shape with eight sides and eight angles. When I say, "Show me," hold up your boards again. (Allow students time to work.)

T: Show me.

S: (Hold up an eight-sided shape, like the one shown to the right.)

T: This time, let's check for eight angles. Point and count again with me. Ready?

S: (Point and count chorally.) 1 angle, 2 angles, …, 8 angles!

T: Now it's your turn to try and stump your partner. Build a shape on your geoboard with any number of sides or angles. Then, trade with your partner. See if you can count the number of sides and angles on your partner's shape. If you agree, then make another shape.

S: (Create shapes on the geoboards, trade with a partner, and count the number of sides and angles.)

T: Now that we have done so much work with different shapes, how would you describe an angle? Talk to your partner.

S: It's the place where the corner is. → It's where two sides of the shape connect. → It's where two sides make a corner. → It's the shape of the place where the two sides touch.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

To support English language learners, write the key terms of the lesson (e.g., *angle, side,* and *attribute*), and post them on the word wall as they are introduced within the meaningful context of the instruction. Students who need the extra support are able to refer to them whenever needed.

T: Yes. Those are all good observations. The angle is the figure formed where two sides meet. (Point to an acute angle on a triangle.) Show me this angle with two pencils. (Repeat the process for an obtuse angle and a right angle.)

Continue directing students to make angles to check their level of understanding. Give students directions, and allow them time to demonstrate various angle sizes.

T: Make a big angle.

T: Make a smaller angle.

T: Make a tiny angle.

T: Make a huge angle.

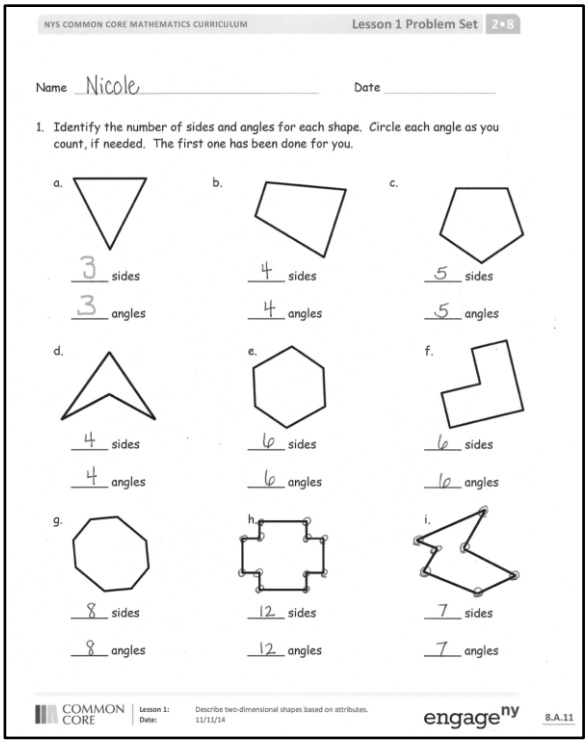
Note: It is not necessary for students to know the terms *obtuse, acute,* and *right* for angles at this stage. This topic focuses instead on naming and describing shapes. The only angle critical to this focus is the right angle, which can be discussed as a square corner.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the purposeful sequencing of the Problem Set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Assign incomplete problems for homework or at another time during the day.

Note: Problem 2(e) can be interpreted in different ways. Each shape has the same number of sides and angles (e.g., Problem 2(a) has three sides and three angles), so a possible correct answer is all of them. Another possible answer is B and C since both shapes have seven sides and seven angles. Problem (d) on the Exit Ticket and Problem 2(e) on the Homework can be interpreted similarly.



NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1 Problem Set 2•8

Name Nicole Date

1. Identify the number of sides and angles for each shape. Circle each angle as you count, if needed. The first one has been done for you.

a. 3 sides, 3 angles
b. 4 sides, 4 angles
c. 5 sides, 5 angles
d. 4 sides, 4 angles
e. 6 sides, 6 angles
f. 6 sides, 6 angles
g. 8 sides, 8 angles
h. 12 sides, 12 angles
i. 7 sides, 7 angles

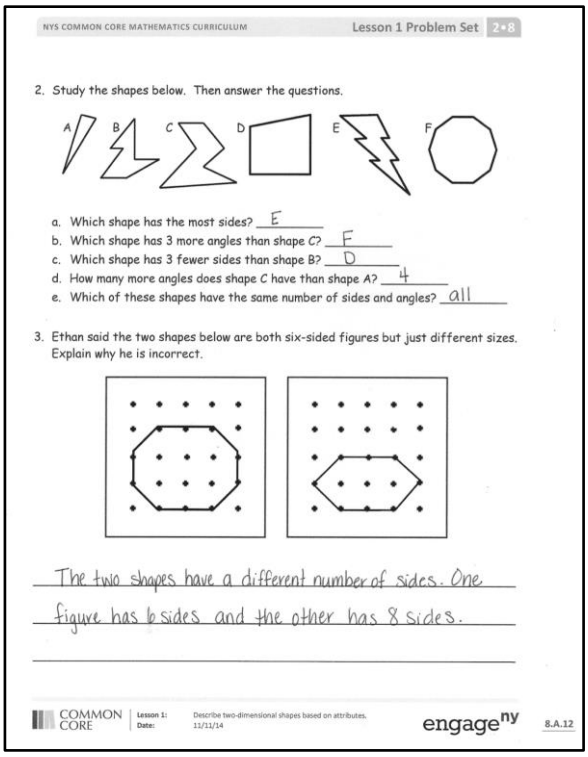
COMMON CORE Lesson 1: Date: 11/11/14 Describe two-dimensional shapes based on attributes. engage^ny 8.A.11

Student Debrief (10 minutes)

Lesson Objective: Describe two-dimensional shapes based on attributes.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.


NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1 Problem Set 2•8

2. Study the shapes below. Then answer the questions.

A B C D E F

a. Which shape has the most sides? E
b. Which shape has 3 more angles than shape C? F
c. Which shape has 3 fewer sides than shape B? D
d. How many more angles does shape C have than shape A? 4
e. Which of these shapes have the same number of sides and angles? all

3. Ethan said the two shapes below are both six-sided figures but just different sizes. Explain why he is incorrect.

The two shapes have a different number of sides. One figure has 6 sides and the other has 8 sides.

COMMON CORE Lesson 1: Date: 11/11/14 Describe two-dimensional shapes based on attributes. engage^ny 8.A.12

Any combination of the questions below may be used to lead the discussion.

- Look at the Problem Set. What did you notice about the number of **angles** and sides in each shape? How did you answer Problem 2(e)?
- Look at all the shapes on the first page of the Problem Set. With your partner, group the shapes based on the number of sides and angles each shape has.
- Look at Problem 3, which shows the two shapes on the geoboards. Tell your partner what would make the smaller shape the same as the larger shape.
- When Ethan first counted the sides on the first shape in Problem 3, he thought that it had 10 sides. How would you explain his mistake to him? How is this like the problem we began with today?
- Tell your partner why you need to pay attention to more than how a shape looks when grouping shapes.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

A

Number Correct: _____

Adding Across a Ten

1.	8 + 1 =	
2.	18 + 1 =	
3.	28 + 1 =	
4.	58 + 1 =	
5.	7 + 2 =	
6.	17 + 2 =	
7.	27 + 2 =	
8.	57 + 2 =	
9.	6 + 3 =	
10.	36 + 3 =	
11.	5 + 4 =	
12.	45 + 4 =	
13.	30 + 9 =	
14.	9 + 2 =	
15.	39 + 2 =	
16.	50 + 8 =	
17.	8 + 4 =	
18.	58 + 4 =	
19.	50 + 20 =	
20.	54 + 20 =	
21.	70 + 20 =	
22.	76 + 20 =	
23.	50 + 30 =	
24.	58 + 30 =	
25.	9 + 3 =	
26.	90 + 30 =	
27.	97 + 30 =	
28.	8 + 4 =	
29.	80 + 40 =	
30.	83 + 40 =	
31.	83 + 4 =	
32.	7 + 6 =	
33.	70 + 60 =	
34.	74 + 60 =	
35.	74 + 5 =	
36.	73 + 6 =	
37.	58 + 7 =	
38.	76 + 5 =	
39.	30 + 40 =	
40.	20 + 70 =	
41.	80 + 70 =	
42.	34 + 40 =	
43.	23 + 50 =	
44.	97 + 60 =	

B

Number Correct: _____

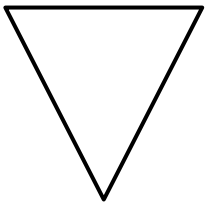
Improvement: _____

Adding Across a Ten

1.	7 + 1 =	
2.	17 + 1 =	
3.	27 + 1 =	
4.	47 + 1 =	
5.	6 + 2 =	
6.	16 + 2 =	
7.	26 + 2 =	
8.	46 + 2 =	
9.	5 + 3 =	
10.	75 + 3 =	
11.	5 + 4 =	
12.	75 + 4 =	
13.	40 + 9 =	
14.	9 + 2 =	
15.	49 + 2 =	
16.	60 + 8 =	
17.	8 + 4 =	
18.	68 + 4 =	
19.	50 + 20 =	
20.	56 + 20 =	
21.	70 + 20 =	
22.	74 + 20 =	
23.	50 + 30 =	
24.	57 + 30 =	
25.	8 + 3 =	
26.	80 + 30 =	
27.	87 + 30 =	
28.	9 + 4 =	
29.	90 + 40 =	
30.	93 + 40 =	
31.	93 + 4 =	
32.	8 + 6 =	
33.	80 + 60 =	
34.	84 + 60 =	
35.	84 + 5 =	
36.	83 + 6 =	
37.	68 + 7 =	
38.	86 + 5 =	
39.	20 + 30 =	
40.	30 + 60 =	
41.	90 + 70 =	
42.	36 + 40 =	
43.	27 + 50 =	
44.	94 + 70 =	

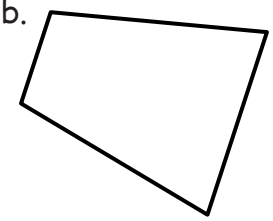
Name _____ Date _____

1. Identify the number of sides and angles for each shape. Circle each angle as you count, if needed. The first one has been done for you.

a. 

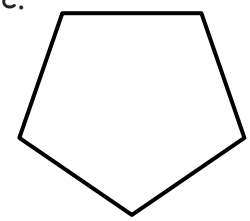
3 sides

3 angles

b. 

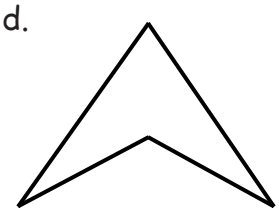
_____ sides

_____ angles

c. 

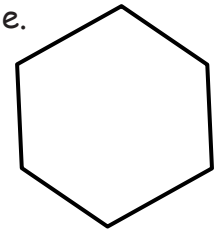
_____ sides

_____ angles

d. 

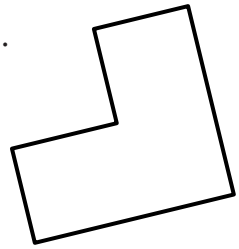
_____ sides

_____ angles

e. 

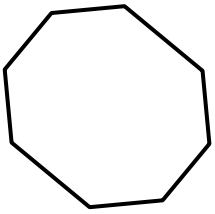
_____ sides

_____ angles

f. 

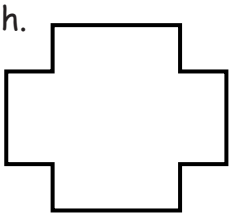
_____ sides

_____ angles

g. 

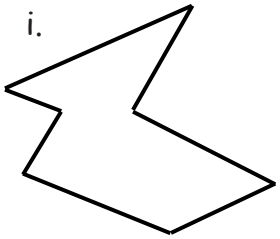
_____ sides

_____ angles

h. 

_____ sides

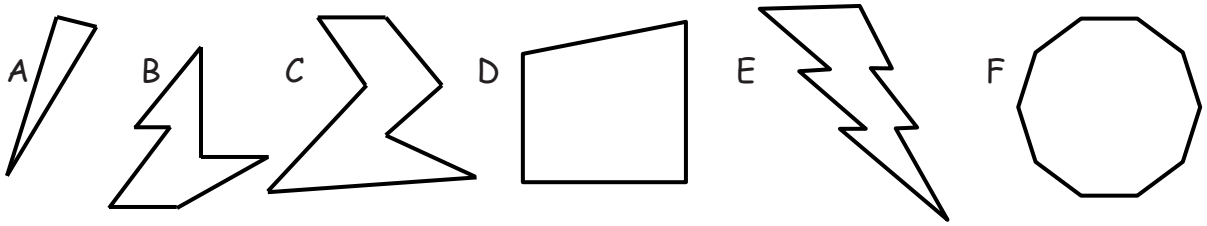
_____ angles

i. 

_____ sides

_____ angles

2. Study the shapes below. Then, answer the questions.



a. Which shape has the most sides? _____

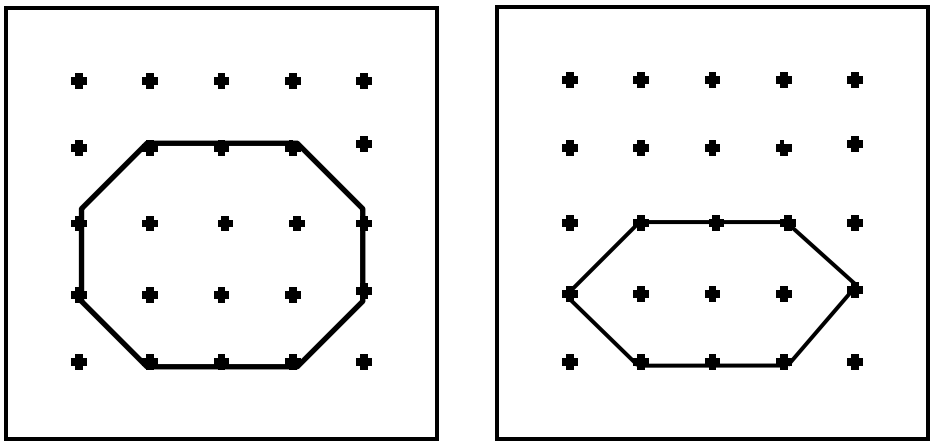
b. Which shape has 3 more angles than shape C? _____

c. Which shape has 3 fewer sides than shape B? _____

d. How many more angles does shape C have than shape A? _____

e. Which of these shapes have the same number of sides and angles? _____

3. Ethan said the two shapes below are both six-sided figures but just different sizes. Explain why he is incorrect.



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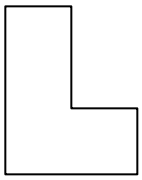
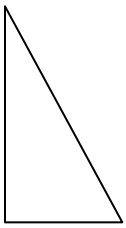
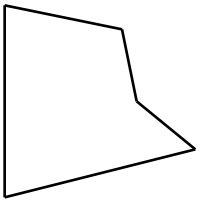
Name _____ Date _____

Study the shapes below. Then, answer the questions.

A 

B 

C 

D 

1. Which shape has the most sides? _____

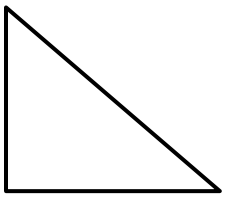
2. Which shape has 3 fewer angles than shape C? _____

3. Which shape has 3 more sides than shape B? _____

4. Which of these shapes have the same number of sides and angles? _____

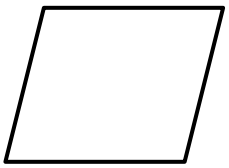
Name _____ Date _____

1. Identify the number of sides and angles for each shape. Circle each angle as you count, if needed.

a. 

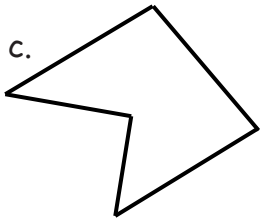
_____ sides

_____ angles

b. 

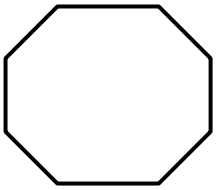
_____ sides

_____ angles

c. 

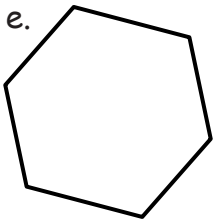
_____ sides

_____ angles

d. 

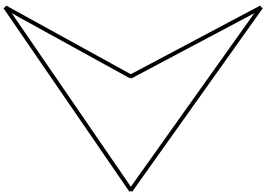
_____ sides

_____ angles

e. 

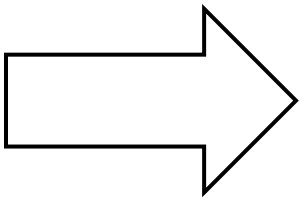
_____ sides

_____ angles

f. 

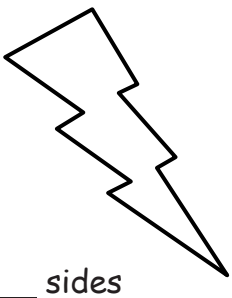
_____ sides

_____ angles

g. 

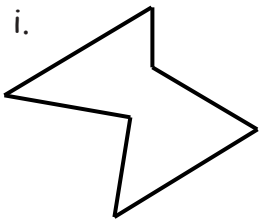
_____ sides

_____ angles

h. 

_____ sides

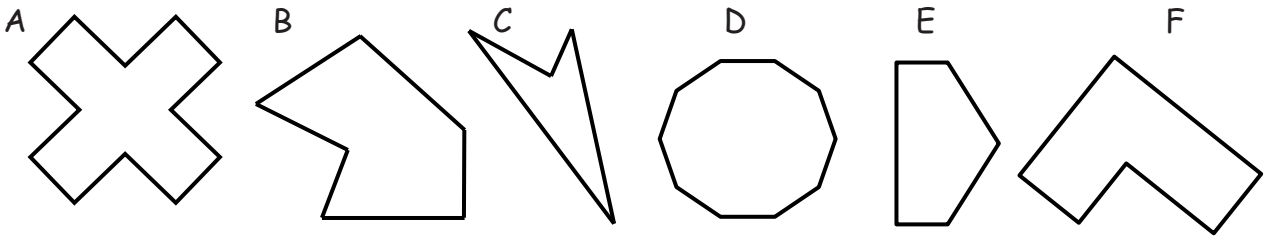
_____ angles

i. 

_____ sides

_____ angles

2. Study the shapes below. Then, answer the questions.



a. Which shape has the most angles? _____

b. Which shape has 4 more angles than shape F? _____

c. Which shape has 5 fewer sides than shape D? _____

d. How many more angles does shape A have than shape B? _____

e. Which of these shapes have the same number of sides and angles? _____

3. Joseph's teacher said to make shapes with 6 sides and 6 angles on his geoboard. Shade the shapes that share these attributes, and circle the shape that does not belong. Explain why it does not belong.