

Building and Drawing Flat Shapes (K.G.5)

Lesson 1

Objective: Describe the systematic construction of flat shapes using ordinal numbers.

Concept Development (25 minutes)

Materials: (S) 15 coffee stir sticks or similar material marked at the midpoint with permanent marker, scissors, small ball of clay, pencil, piece of construction paper, ruler

[reduced to relevant portion]

T: You are going to be builders today. We are going to be making shapes. Look at the materials you have. What do you notice?

S: We have some sticks! → There is clay, too.

T: Pick up your sticks and arrange them on your desk. Try to make a shape. Who has an idea?

S: I used four sticks. I made a square.

T: How do you know it is a square?

S: There are four sides, and they are all the same! → It has four corners. → It is closed.

T: Did anyone think of something else?

S: I only used three sticks. I made a triangle.

T: How do you know it is a triangle?

S: There are three straight sides. → There are three corners, and they are all connected.

T: We are going to practice more shape-making.

First, use your scissors to cut each of your sticks at the mark in the middle.

Second, arrange your little sticks to make different flat shapes.

Third, use bits of clay to connect the corners of your new shapes.

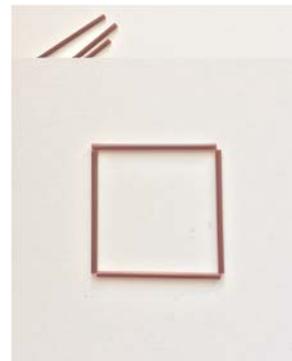
T: If you haven't made a square already, please do so now. Then, you may experiment. How many different shapes can you make? We will have a shape show when you are done. (Allow ample time for experimentation and construction.)

T: Who would like to share one of their shapes? Tell us what you did first, second, and third. Use your math words!

S: I made a triangle! First, I cut the sticks. Second, I picked three sticks for the sides. Third, I stuck them together with clay!

S: I made a hexagon. First, I cut the sticks. Second, I chose six and put them on my desk. Third, I used balls of clay to connect them.

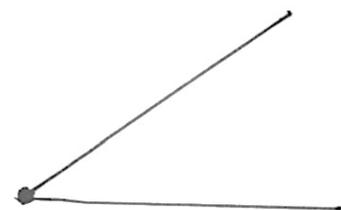
T: Listen again. Get your pencil and construction paper ready. First, put a dot on the left side of your paper. Second, draw a line that starts at that dot with your ruler. Third, draw another line that



Second



Third



MP.6

starts at the same dot with your ruler.

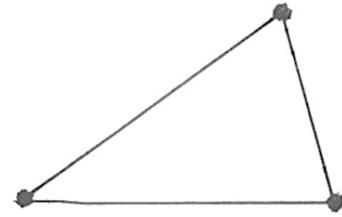
S: (Work.)

T: Show me your work.

S: (Show their work.)

T: Listen again. First, put a dot at the ends of both your lines. Second, draw a line with your ruler to connect those dots. Third, show your work to a friend and tell him or her what shape you drew. (Allow time for sharing.)

T: Now, share about *all* your shapes with your friends, the ones we made with straws *and* the one we made with your ruler.



Allow time for sharing and discussion. If students built shapes with five sides, or more than six sides, casually mention the name of the shape. Five sides is a pentagon. Seven sides is a heptagon. Eight sides is an octagon. Nine sides is a nonagon. Ten sides is a decagon.

T: Listen carefully. First, put your name on your construction paper. Second, carefully lift your shapes onto your paper. Third, stand up and get ready to look at the shapes the rest of the class created! It's time for a shape show! (Allow students to circulate to view and discuss one another's work. Encourage mathematical discussion and precision in vocabulary. When they are done, move the papers carefully to a part of the room where they may be saved for use in Lesson 3 of this module.)

Student Debrief (8 minutes)

Lesson Objective: Describe the systematic construction of flat shapes using ordinal numbers.

- What words did we use to help us complete our Problem Set in order?
- What was the first thing we did in our Problem Set? Did everyone draw a line to complete the triangle first, before they colored their triangle green?
- Look at the triangles and squares you drew in your Problem Set. Are all the sides equal in length? Find someone who drew their shapes with equal length sides; find someone who drew their shapes with unequal length sides.
- How did the words **first**, **second**, and **third** help us be good builders today?
- Can you think of a time when order is important? What would happen if we put our shoes on first and our socks on second?
- Can you think of other ways that we use words like *first*, *second*, and *third*?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1 Problem Set 6.A.7

Name Robin Date 5-24-13

Listen to the directions.

First, draw the missing line to finish the triangle using a ruler. Second, color the corners red. Third, draw another triangle.

First, use your ruler to draw 2 lines to make a square. Second, color the corners red. Third, draw another square.

First, draw a triangle using your ruler. Second, draw a different triangle using your ruler. Third, show your pictures to your partner.

COMMON CORE Lesson 1: Describe the systematic construction of flat shapes using ordinal numbers. Date: 05/16/13 engage^{ny} 6.A.7

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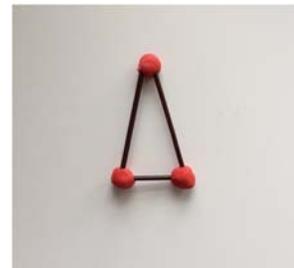
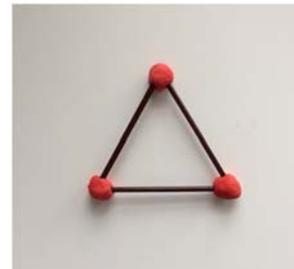
Lesson 2

Objective: Build flat shapes with varying side lengths and record with drawings.

Concept Development (25 minutes)

Materials: (S) Approximately 15 coffee stir sticks, scissors, personal white board, small ball of clay

- T: Who can remind us about what we did in math class yesterday? Can you use your math words to tell us, in order, the steps that we took in our lesson?
- S: First, we cut our sticks. They were all the same length! → Second, we made flat shapes with them on our desks. → Third, we stuck the ends together with clay at the corners.
- T: That's right. We are going to make more flat shapes today. Yesterday, we made special rectangles that had equal sides. What did we call them?
- S: Squares.
- T: Today, use your sticks and your clay to create another type of rectangle, one that has corners like an L but whose sides are not all the same length.
- T: (Pause.) You may cut one or two of your sticks if you need to. (Allow time for students to plan and create the shape. Circulate to support students who might need it.) Hold up your rectangles! How do you know they are rectangles?
- S: It's like a square but it is stretched! → It has two long sides and two shorter sides. → I had to cut one of my sticks in half! → They have corners that look like an L. → It has four sides.
- T: Take three sticks that are the same length. Now use those sticks to make a closed shape with three straight sides. (Allow time for students to experiment.) Hold up your shapes. What do we call this shape?
- S: It is a triangle!
- T: What if you take one of the sides of your triangle and cut it to be shorter, then put it back into your shape? (Allow time for students to experiment.) What do you notice?
- S: It is still a triangle. → It just has one side that is shorter. → It looks pointier, but it still has three sides and three corners. → Two sides are the same length!
- T: Great job! With your partner, use your sticks and your clay to make several different flat shapes. You may cut the sticks to be any lengths you like. Be creative! (Allow ample time for student work. Encourage students to think about not only convex but also concave figures. Hold up any interesting examples you observe for extra inspiration. Again, if students ask, casually mention the names of created



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NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students with disabilities who might have difficulty with fine motor activities could benefit from using a geoboard and rubber bands to make different shapes or by allowing them to use interactive technology such as the one found at http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html. (In the Select Grade drop-down menu, click Kindergarten. In the Manipulatives drop-down menu, click Geoboard/Bands.)

shapes they may not have studied yet.)

T: Wow! You made a lot of different shapes! Would anyone like to show their favorite and tell the class about it? (Allow time for discussion.)

T: With your ruler and your marker, try to copy each of your new shapes on your board.

Allow time for students to replicate their shapes on paper. Circulate to offer assistance to students who may still need help in keeping their rulers straight and still during construction. If time permits, allow students to turn and talk to their partners to describe the shapes they drew.

Student Debrief (13 minutes)

Lesson Objective: Build flat shapes with varying side lengths and record with drawings.

- Look at all the triangles on your Problem Set. Tell your partner what they all have in common. Choose two triangles that are different. Tell your partner how they are different.
- Does a triangle need to be closed? Can it have gaps between the sides?
- I heard you say that all of the triangles are closed and have three sides and three corners. Do they all look the same? Tell your partner how many different looking triangles you think you could draw.
- When you made a shape with four straws and corners like an L, what did you call it? What did you call the special shape you made where all four straws were the same length?
- (Hold up a set of three equal straws and a set of three straws with different lengths.) If I asked you to make a triangle, which set of straws would you choose? Why?
- Look carefully at your flat shapes and at those of your peers. What are some ways we could sort them? (Take time to allow several iterations of shape-sorting with the students. Encourage them to be creative in their thinking. Apart from the number of sides, also guide them to think about attributes such as concave vs. convex, regular vs. irregular, etc.)

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 2 Problem Set

Name Ben Date 5-25-13

First, use a ruler to trace the shapes. Second, draw the shapes using your ruler following the directions in the box.

Draw 3 different triangles.

Draw 2 different rectangles.

Draw 1 hexagon.

COMMON CORE Lesson 2: Build flat shapes with varying side lengths and record with drawings. Date: 10/16/13 engageNY 6.A.9

Lesson 4

Objective: Describe the relative position of shapes using ordinal numbers.

Application Problem (5 minutes)

Materials: (S) Personal white boards

- First, draw 3 three-sided shapes on your board.
- Second, draw 4 four-sided shapes on your paper.
- Third, draw a number bond and write a number sentence to tell how many shapes you have in all.

Share your work with your partner. Do your shapes look the same? Do your number bonds look the same? How about your number sentences?

Note: Today's Application Problem serves as a link among the ordinal number discussions, shape constructions, number bonds, and number sentences. It serves as a review of some of the concepts from earlier modules as well as providing the anticipatory set for today's lesson.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Break the third step into smaller steps for students working below grade level. Ask, "How many three-sided shapes? How many four-sided shapes? How many altogether?" They can also work directly on a number bond template.