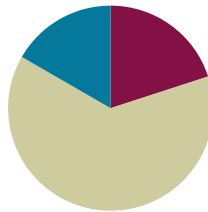


Lesson 21

Objective: Draw and identify varied two-dimensional figures from given attributes.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Concept Development	(38 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (12 minutes)

- Sprint: Divide by Multiples of 10 and 100 **5.NBT.2** (8 minutes)
- Find the Volume **5.MD.5** (4 minutes)

Sprint: Divide by Multiples of 10 and 100 (8 minutes)

Materials: (S) Divide by Multiples of 10 and 100 Sprint

Note: This fluency activity reviews Module 2.

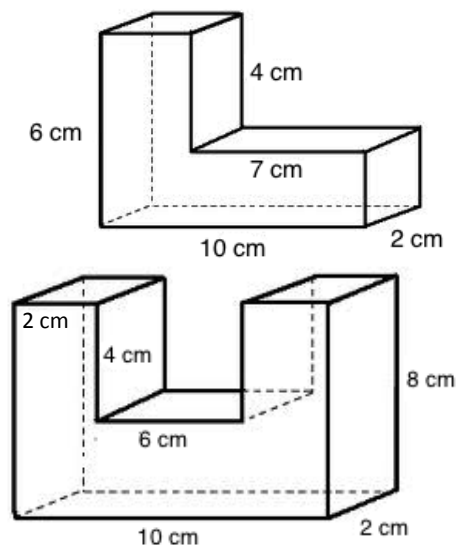
Find the Volume (4 minutes)

Materials: (S) Personal white board

Note: This fluency activity reviews Topic B.

- T: Say the formula for finding the volume of a rectangular prism.
- S: Length times width times height.
- T: (Project a figure as shown to the right.) Visualize a line that breaks the figure into two rectangular prisms.
- T: Find the volume of the composite figure by adding the volumes of each rectangular prism.
- S: (Write $6\text{ cm} \times 3\text{ cm} \times 2\text{ cm} = 36\text{ cubic cm}$.
 $7\text{ cm} \times 2\text{ cm} \times 2\text{ cm} = 28\text{ cubic cm}$.
 $36\text{ cubic cm} + 28\text{ cubic cm} = 64\text{ cubic cm}$.)

Allow early finishers to continue on to the next figure.



Concept Development (38 minutes)

Materials: (S) Task cards, 6 for each pair of students (Templates 1–4), ruler, set square, protractor, Problem Set (or blank paper)

Note: The drawing tasks in the Concept Development are time-consuming. In order to give students ample time, no Application Problem is included in today’s lesson.

Note: Today’s Concept Development asks students to apply the nested relationships among quadrilaterals that have been explored throughout this topic. It should be conducted following a protocol similar to that of a problem-solving lesson involving word problems. Allow students to wrestle with the drawing tasks and then share the work during the Student Debrief. Allow students to redraw, as necessary, after the Student Debrief discussion. Task cards (24 per set) should be copied in sufficient quantity that pairs of students can share six cards.

MP.3

- T: (Project on the board: Draw a quadrilateral that has two pairs of equal sides. Tell as many names as you can for this shape. Circle the most specific name.) What shape could you draw to satisfy the attributes of this task? Turn and talk. Then, draw your shape.
- S: I could draw a parallelogram. It has two pairs of equal sides. → A rectangle would work because it has two pairs of equal sides. → It says “two pairs of equal sides.” I would draw a square. It has two sets of equal sides. The two sets also happen to be equal to each other. → A rhombus would work, too, because it is like a square. It has two sets of equal sides. → I could draw a kite. It has two pairs of equal sides. The sides that are equal are just next to each other rather than across from each other.
- T: Compare your shape with your neighbor’s. Did we all draw the same shape? Is there only one shape that would be correct for this task?
- S: (Share work with partner.)
- T: This is the shape I drew. (Project a rectangle.) Name this shape.
- S: Rectangle. → Parallelogram. → Quadrilateral. → Polygon. → Trapezoid.
- T: (Record student responses.) Which of the names we listed is the most specific?
- S: Rectangle.
- T: (Circle *rectangle* on the board.) Is there a quadrilateral that we should not construct for this task? Why not?
- S: A trapezoid that is not a parallelogram because it would not have two pairs of equal sides. → An isosceles trapezoid would not work for this task because there would only be one set of equal sides.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

The task cards for today’s lesson are numbered from simplest to most complex. Differentiate instruction by assigning tasks based on student need.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

The relationships between sides and angles in quadrilaterals can serve as an interesting extension. Students can explore the effects of changing side lengths on angle size, and vice versa, with online tools like Interactive Quadrilaterals at:
<http://www.mathsisfun.com/geometry/quadrilaterals-interactive.html>.

T: Pull six task cards from the envelope on your table. Record the number of the task and a brief summary of the task in the boxes on your Problem Set. Follow the directions on the cards to draw the shapes in the boxes.

S: (Work.)

The Problem Set serves as a recording sheet for the drawings in the lesson. Time should be given for students to share their approaches to constructing the figures on the task cards.

Student Debrief (10 minutes)

Lesson Objective: Draw and identify varied two-dimensional figures from given 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.

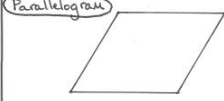

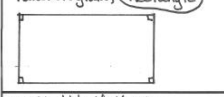
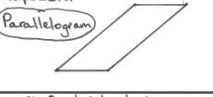
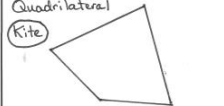
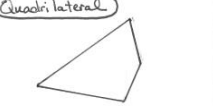
Any combination of the questions below may be used to lead the discussion.

- Find someone who completed two of the same tasks you did. Compare the shapes that you drew. Must they be the same shape to correctly follow the directions on the card? Why or why not?
- Which tasks produced quadrilaterals with the same specific name on everyone’s Problem Set? Which tasks produced the most varied quadrilaterals?
- Choose three of your quadrilaterals, and paste them in the correct part of the hierarchy diagram. Explain why they belong there.
- Explain to your partner how you corrected John’s error in Problem 2.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 21 Problem Set 5•5

Name Baxter Date _____

1. Write the number on your task card and a summary of the task in the blank. Then draw the figure in the box. Label your figure with as many names as you can. Circle the most specific name.

<p>Task #17: Parallelogram with 60° angle</p> <p>Quadrilateral, Trapezoid Parallelogram</p> 	<p>Task #7: Quadrilateral with 4 equal sides</p> <p>Quadrilateral, Trapezoid, Parallelogram, Kite, Rhombus</p> 
<p>Task #2: Rectangle with a length twice its width</p> <p>Quadrilateral, Trapezoid, Parallelogram, Rectangle</p> 	<p>Task #11: Parallelogram with no right angles</p> <p>Quadrilateral, Trapezoid, Parallelogram</p> 
<p>Task #21: Kite that is not a parallelogram</p> <p>Quadrilateral, Kite</p> 	<p>Task #24: Quadrilateral whose diagonals do not bisect each other</p> <p>Quadrilateral</p> 

COMMON CORE Lesson 21: Draw and identify varied two-dimensional figures from given attributes. Date: 9/12/14 engageNY 5.D.8.3

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 21 Problem Set 5•5

2. John says that because rhombuses do not have perpendicular sides, they cannot be rectangles. Explain his error in thinking.

In order to be a rhombus a quadrilateral needs 4 equal sides. Some rhombuses do have perpendicular sides. These are squares, and squares are rectangles.

3. Jack says that because kites don't have parallel sides, a square is not a kite. Explain his error in thinking.

A Kite needs to have 2 pairs of equal adjacent sides. If the 2 pairs are the same length, and the angles are all 90°, then the kite could be a square.

COMMON CORE Lesson 21: Draw and identify varied two-dimensional figures from given attributes. Date: 9/12/14 engageNY 5.D.8.4

- What part of a kite's definition did Jack not understand in Problem 3? How did you correct his thinking?
- How do all the shapes that were drawn today fit the definition of a quadrilateral?

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: _____

Divide by Multiples of 10 and 100

1.	$30 \div 10 =$	
2.	$430 \div 10 =$	
3.	$4,300 \div 10 =$	
4.	$4,300 \div 100 =$	
5.	$43,000 \div 100 =$	
6.	$50 \div 10 =$	
7.	$850 \div 10 =$	
8.	$8,500 \div 10 =$	
9.	$8,500 \div 100 =$	
10.	$85,000 \div 100 =$	
11.	$600 \div 10 =$	
12.	$60 \div 3 =$	
13.	$600 \div 30 =$	
14.	$4,000 \div 100 =$	
15.	$40 \div 2 =$	
16.	$4,000 \div 200 =$	
17.	$240 \div 10 =$	
18.	$24 \div 2 =$	
19.	$240 \div 20 =$	
20.	$3,600 \div 100 =$	
21.	$36 \div 3 =$	
22.	$3,600 \div 300 =$	

23.	$480 \div 4 =$	
24.	$480 \div 40 =$	
25.	$6,300 \div 3 =$	
26.	$6,300 \div 30 =$	
27.	$6,300 \div 300 =$	
28.	$8,400 \div 2 =$	
29.	$8,400 \div 20 =$	
30.	$8,400 \div 200 =$	
31.	$96,000 \div 3 =$	
32.	$96,000 \div 300 =$	
33.	$96,000 \div 30 =$	
34.	$900 \div 30 =$	
35.	$1,200 \div 30 =$	
36.	$1,290 \div 30 =$	
37.	$1,800 \div 300 =$	
38.	$8,000 \div 200 =$	
39.	$12,000 \div 200 =$	
40.	$12,800 \div 200 =$	
41.	$2,240 \div 70 =$	
42.	$18,400 \div 800 =$	
43.	$21,600 \div 90 =$	
44.	$25,200 \div 600 =$	

Number Correct: _____

Improvement: _____

B

Divide by Multiples of 10 and 100

1.	$20 \div 10 =$	
2.	$420 \div 10 =$	
3.	$4,200 \div 10 =$	
4.	$4,200 \div 100 =$	
5.	$42,000 \div 100 =$	
6.	$40 \div 10 =$	
7.	$840 \div 10 =$	
8.	$8,400 \div 10 =$	
9.	$8,400 \div 100 =$	
10.	$84,000 \div 100 =$	
11.	$900 \div 10 =$	
12.	$90 \div 3 =$	
13.	$900 \div 30 =$	
14.	$6,000 \div 100 =$	
15.	$60 \div 2 =$	
16.	$6,000 \div 200 =$	
17.	$240 \div 10 =$	
18.	$24 \div 2 =$	
19.	$240 \div 20 =$	
20.	$6,300 \div 100 =$	
21.	$63 \div 3 =$	
22.	$6,300 \div 300 =$	

23.	$840 \div 4 =$	
24.	$840 \div 40 =$	
25.	$3,600 \div 3 =$	
26.	$3,600 \div 30 =$	
27.	$3,600 \div 300 =$	
28.	$4,800 \div 2 =$	
29.	$4,800 \div 20 =$	
30.	$4,800 \div 200 =$	
31.	$69,000 \div 3 =$	
32.	$69,000 \div 300 =$	
33.	$69,000 \div 30 =$	
34.	$800 \div 40 =$	
35.	$1,200 \div 40 =$	
36.	$1,280 \div 40 =$	
37.	$1,600 \div 400 =$	
38.	$8,000 \div 200 =$	
39.	$14,000 \div 200 =$	
40.	$14,600 \div 200 =$	
41.	$2,560 \div 80 =$	
42.	$16,100 \div 700 =$	
43.	$14,400 \div 60 =$	
44.	$37,800 \div 900 =$	

Name _____

Date _____

- Write the number on your task card and a summary of the task in the blank. Then, draw the figure in the box. Label your figure with as many names as you can. Circle the most specific name.

Task #__: _____ 	Task #__: _____
Task #__: _____ 	Task #__: _____
Task #__: _____ 	Task #__: _____

Name _____ Date _____

1. Use the word bank to fill in the blanks.

trapezoids parallelograms

All _____ are _____, but not all _____ are _____.

2. Use the word bank to fill in the blanks.

kites rhombuses

All _____ are _____, but not all _____ are _____.

Name _____

Date _____

1. Answer the questions by checking the box.

Sometimes **Always**

a. Is a square a rectangle?

--	--

b. Is a rectangle a kite?

--	--

c. Is a rectangle a parallelogram?

--	--

d. Is a square a trapezoid?

--	--

e. Is a parallelogram a trapezoid?

--	--

f. Is a trapezoid a parallelogram?

--	--

g. Is a kite a parallelogram?

--	--

h. For each statement that you answered with *sometimes*, draw and label an example that justifies your answer.

2. Use what you know about quadrilaterals to answer each question below.

a. Explain when a trapezoid is not a parallelogram. Sketch an example.

b. Explain when a kite is not a parallelogram. Sketch an example.

<p>Task 1: Draw a trapezoid with a right angle.</p>	<p>Task 2: Draw a rectangle with a length that is twice its width.</p>	<p>Task 3: Draw a quadrilateral with 2 pairs of equal sides and no parallel sides.</p>
<p>Task 4: Draw a rhombus with right angles.</p>	<p>Task 5: Draw a parallelogram with two pairs of perpendicular sides.</p>	<p>Task 6: Draw a rhombus with 4 equal angles.</p>

task cards (1–6)

<p>Task 7: Draw a quadrilateral with four equal sides.</p>	<p>Task 8: Draw a parallelogram with right angles.</p>	<p>Task 9: Draw a parallelogram with a side of 4 cm and a side of 6 cm.</p>
<p>Task 10: Draw an isosceles trapezoid.</p>	<p>Task 11: Draw a parallelogram with no right angles.</p>	<p>Task 12: Draw a rectangle that is also a rhombus.</p>

task cards (7–12)

<p>Task 13: Draw a quadrilateral that has at least one pair of equal opposite angles.</p>	<p>Task 14: Draw a quadrilateral that has only one pair of equal opposite angles.</p>	<p>Task 15: Draw a trapezoid with four right angles.</p>
<p>Task 16: Draw a kite that is also a parallelogram.</p>	<p>Task 17: Draw a parallelogram with a 60° angle.</p>	<p>Task 18: Draw a rectangle that is not a rhombus.</p>

task cards (13–18)

<p>Task 19: Draw a rhombus that is not a rectangle.</p>	<p>Task 20: Draw a parallelogram that is not a rectangle.</p>	<p>Task 21: Draw a kite that is not a parallelogram.</p>
<p>Task 22: Draw a quadrilateral whose diagonals bisect each other at a right angle.</p>	<p>Task 23: Draw a trapezoid that is not a parallelogram.</p>	<p>Task 24: Draw a quadrilateral whose diagonals do not bisect each other.</p>

task cards (19–24)