



Core Knowledge[®] MATHEMATICS

Shapes on the Coordinate Plane



Student Workbook



Creative Commons Licensing

This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike
4.0 International License.



You are free:

- to Share**—to copy, distribute, and transmit the work
- to Remix**—to adapt the work

Under the following conditions:

Attribution—You must attribute the work in the following manner:
CKMath 6–8 was originally developed by Open Up Resources and authored by Illustrative Mathematics, <https://www.illustrativemathematics.org>, and is copyrighted as 2017–2019 by Open Up Resources. It is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0). The Open Up Resources 6–8 Math Curriculum is available at: <https://www.openupresources.org/math-curriculum/>.

Adaptations and updates to the IM 6–8 Math English language learner supports and the additional English assessments marked as "B" are copyright 2019 by Open Up Resources and licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

Adaptations and updates to the IM K–8 Math Spanish translation of assessments marked as "B" are copyright 2019 by Illustrative Mathematics. These adaptations and updates are licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

This particular work is based on additional work of the Core Knowledge® Foundation (www.coreknowledge.org) made available through licensing under a Creative Commons Attribution-Non Commercial-Share Alike 4.0 International License. This does not in any way imply that the Core Knowledge Foundation endorses this work.

Noncommercial—You may not use this work for commercial purposes.

Share Alike—If you alter, transform, or build upon this work, you may distribute the resulting work only under the same or similar license to this one.

With the understanding that:

For any reuse or distribution, you must make clear to others the license terms of this work. The best way to do this is with a link to this web page:

<https://creativecommons.org/licenses/by-nc-sa/4.0/>

Copyright © 2023 Core Knowledge Foundation
www.coreknowledge.org

All Rights Reserved.

Core Knowledge®, Core Knowledge Curriculum Series™, Core Knowledge Math™ and CKMath™ are trademarks of the Core Knowledge Foundation.

Trademarks and trade names are shown in this book strictly for illustrative and educational purposes and are the property of their respective owners. References herein should not be regarded as affecting the validity of said trademarks and trade names.

ISBN: 979-8-88970-902-2

Shapes on the Coordinate Plane

Table of Contents

Lesson 1	Explore the Coordinate Grid	1
Lesson 2	Points on the Coordinate Grid	6
Lesson 3	Plot More Points	10
Lesson 4	Sort Quadrilaterals	15
Lesson 5	Trapezoids	19
Lesson 6	Hierarchy of Quadrilaterals	22
Lesson 7	Rectangles and Squares	25
Lesson 8	Sort Triangles	28
Lesson 9	Generate Patterns	32
Lesson 10	Interpret Relationships	36
Lesson 11	Patterns and Ordered Pairs	40
Lesson 12	Represent Problems on the Coordinate Grid	44
Lesson 13	Perimeter and Area of Rectangles	48
Cumulative Practice Problems		
Section A:	The Coordinate Plane	52
Section B:	The Hierarchy of Shapes	57
Section C:	Numerical Patterns	61



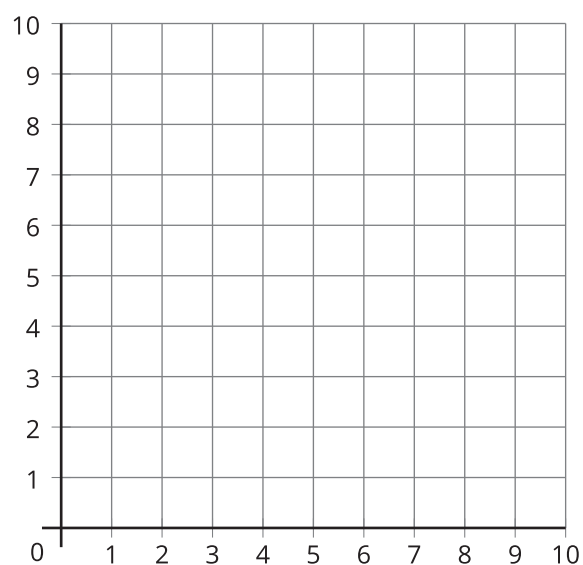
Shapes on the Coordinate Plane
Student Workbook
Core Knowledge Mathematics™

Lesson 1: Explore the Coordinate Grid

- Let's explore the coordinate grid.

Warm-up: Notice and Wonder: The Grid

What do you notice? What do you wonder?



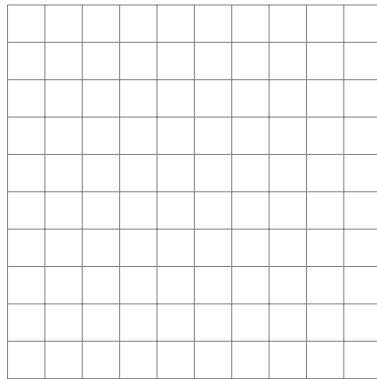
1.1: Can You Draw It: Shapes on the Coordinate Grid

1. Play three rounds of Draw My Shape using the three sets of cards from your teacher.

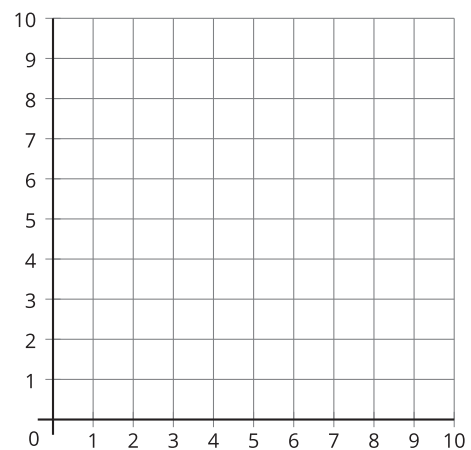
For each round:

- Partner A choose a card—without showing your partner—and describe the shape on the card.
- Partner B draw the shape as described.
- Partner A reveal the card and partner B reveal the drawing.
- Compare the shapes and discuss: What's the same? What's different?

Round 1



Round 2



Round 3

2. Look at partner B's drawings for each round. When does partner B's drawing look most like the shape on the card? Explain why you think that is so.

1.2: Guess Which One: Shapes on the Coordinate Grid

1. Play a round of Guess Which One.

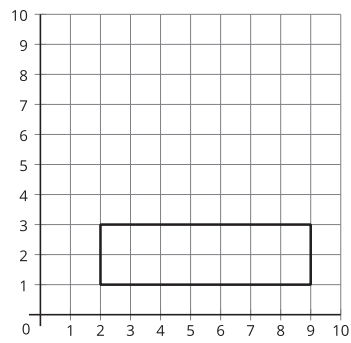
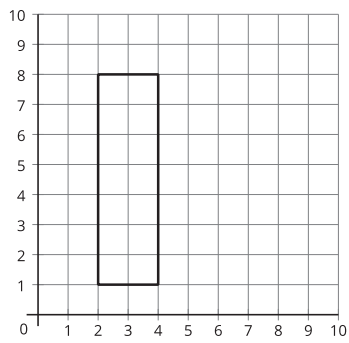
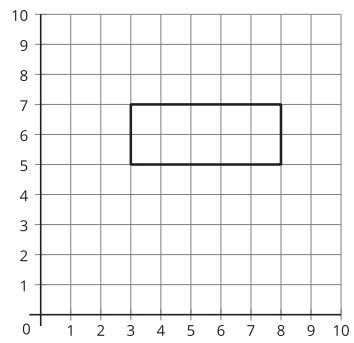
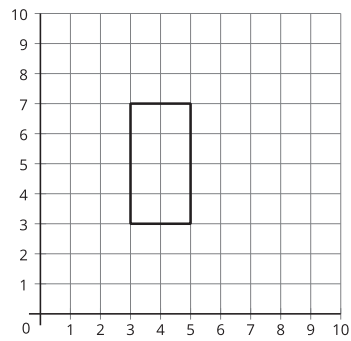
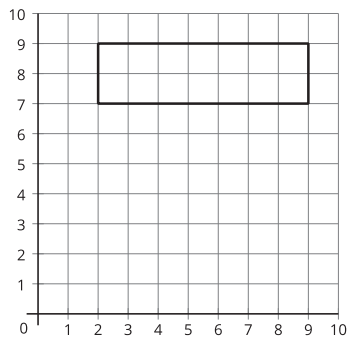
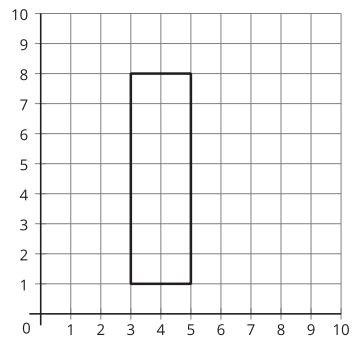
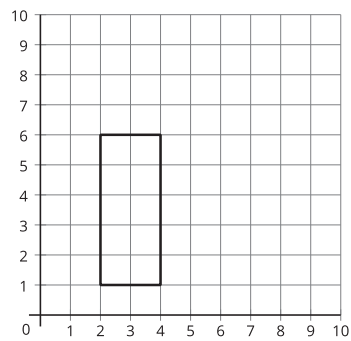
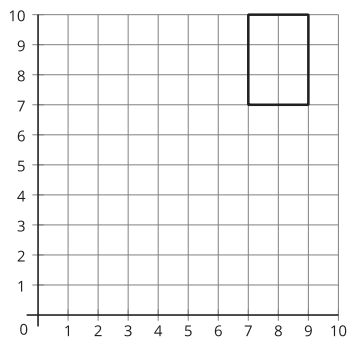
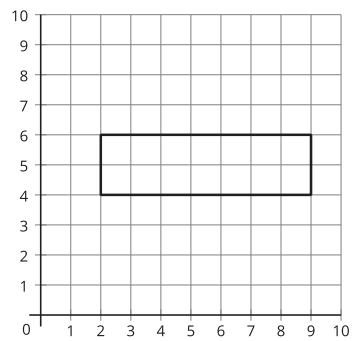
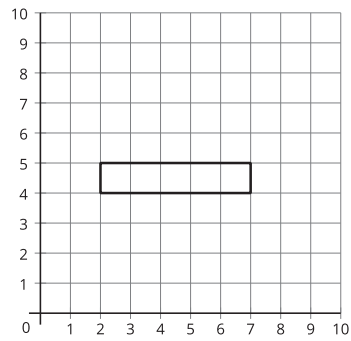
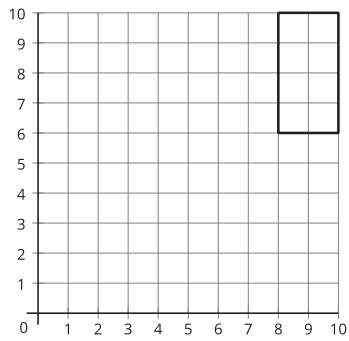
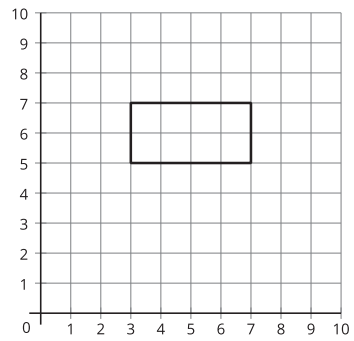
- Sit next to your partner.

- Partner A:

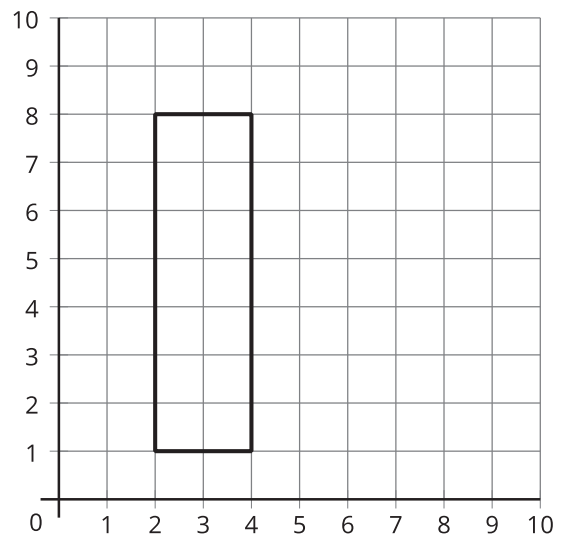
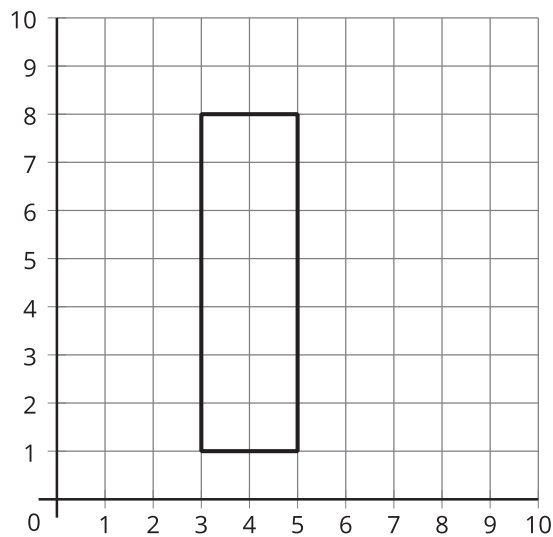
Mentally choose a shape card without indicating which shape card you chose.

- Partner B:

Ask yes or no questions to determine which shape card partner A has chosen.

A**B****C****D****E****F****G****H****I****J****K****L**

2. Switch roles and play another round of Guess Which One.
3. Diego and Kiran were playing a round of Guess Which One. These are the last two shapes. What question can Kiran ask to determine which shape is the one that Diego picked?

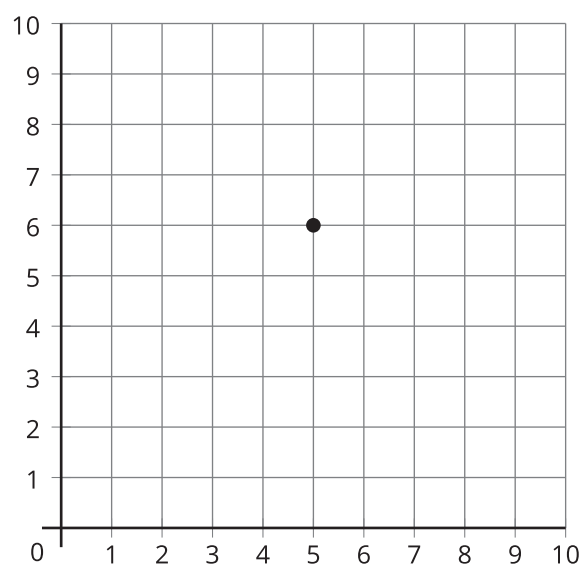


Lesson 2: Points on the Coordinate Grid

- Let's plot points on the coordinate grid.

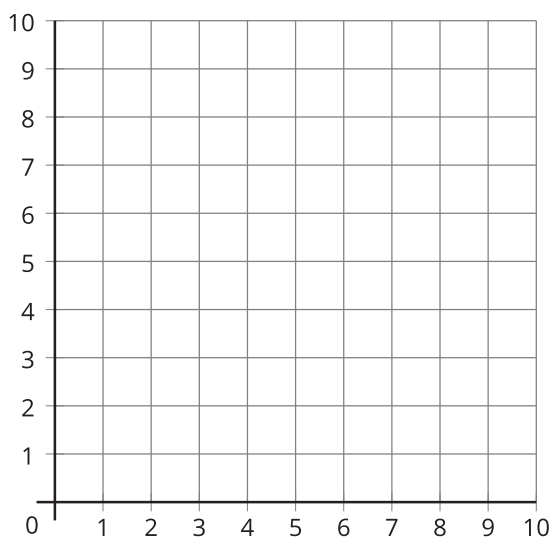
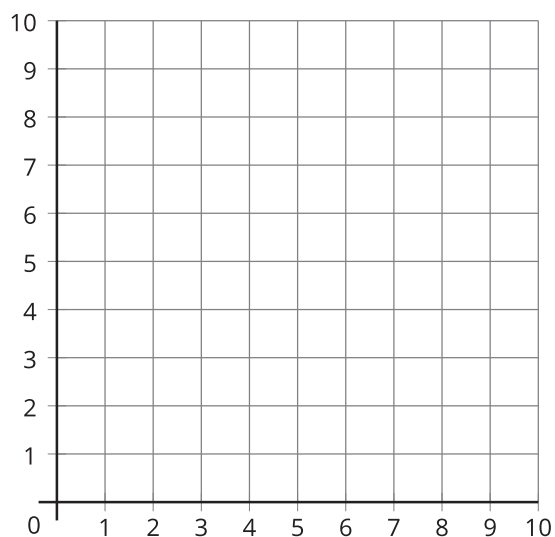
Warm-up: Notice and Wonder: A Point

What do you notice? What do you wonder?

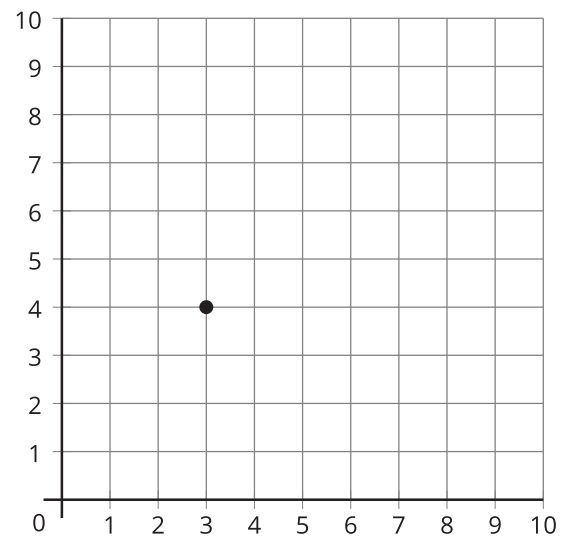


2.1: What's the Point?

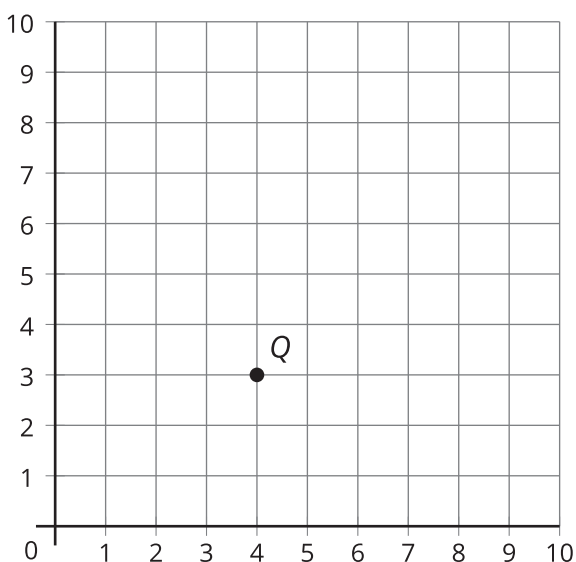
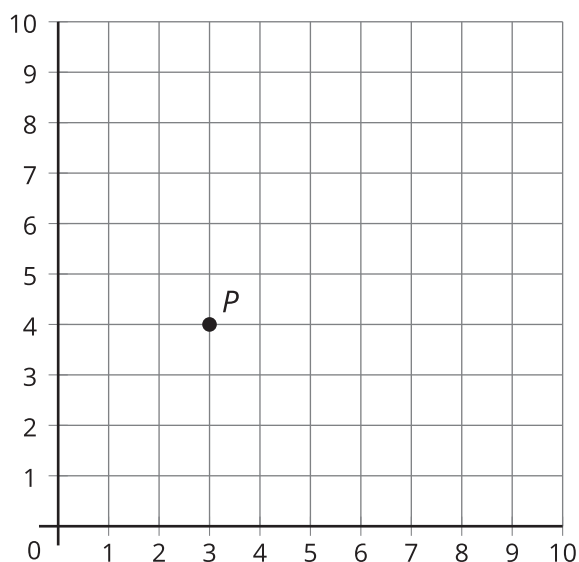
1. Play 2 rounds of What's the Point so each partner gets a chance to draw.
 - Sit back to back with your partner.
 - Partner A: Choose a card. Then, describe the location of the point to your partner.
 - Partner B: Draw the point on the blank coordinate grid.
 - Compare the card with your partner's diagram.
 - Discuss: What's the same? What's different?



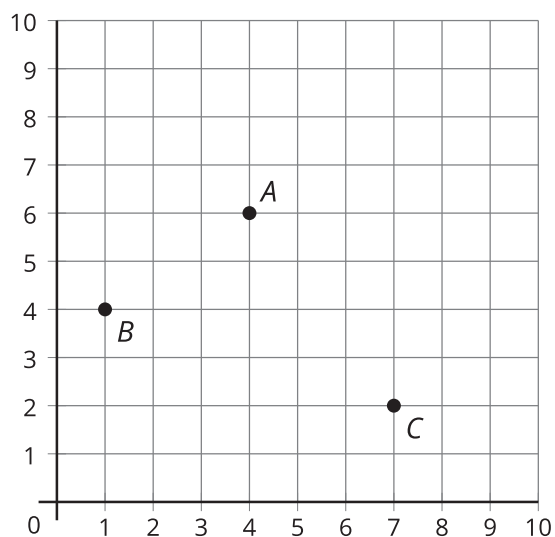
2. Use words to explain the location of the point on the grid.



2.2: Plot and Label Points



1. List the coordinates for each point.



	coordinates
<i>A</i>	(__ , __)
<i>B</i>	(__ , __)
<i>C</i>	(__ , __)

2. Plot points *D*, *E*, *F* on the same grid.

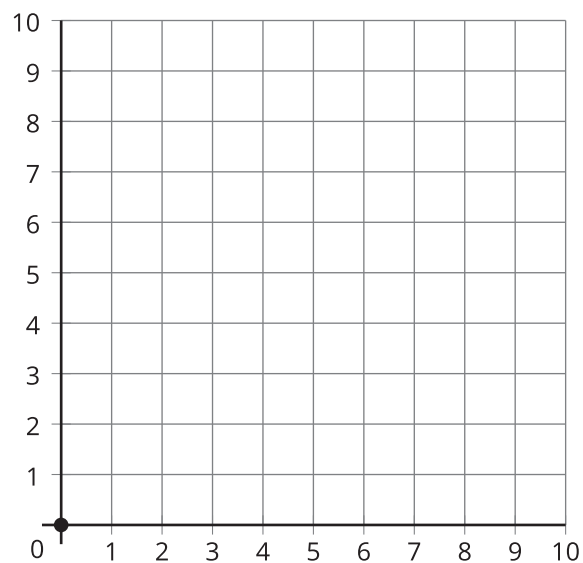
	coordinates
<i>D</i>	(6, 4)
<i>E</i>	(2, 5)
<i>F</i>	(8, 3)

Lesson 3: Plot More Points

- Let's locate and name points on the coordinate grid.

Warm-up: Notice and Wonder: Points with Zero

What do you notice? What do you wonder?

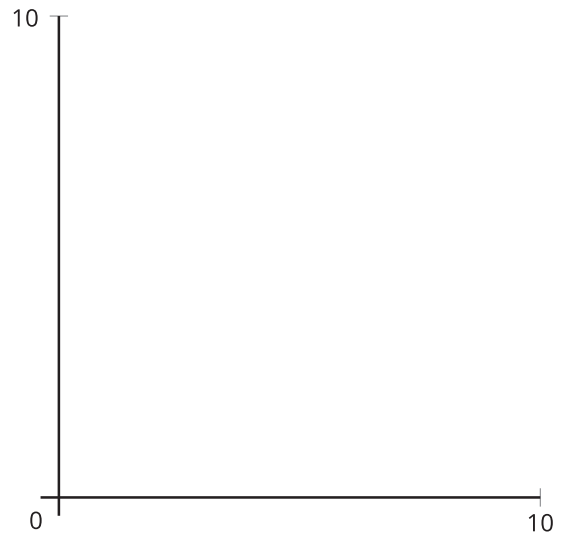


3.1: What's the Point?

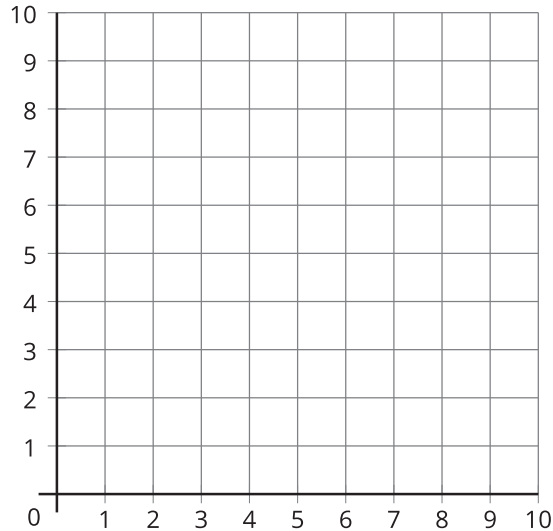
Partner A

1. Estimate the location of each point.

Point	Coordinates
<i>A</i>	(5, 1)
<i>B</i>	(5, 2)
<i>C</i>	(5, 3)
<i>D</i>	(5, 4)



2. Plot and label the points on the coordinate grid.

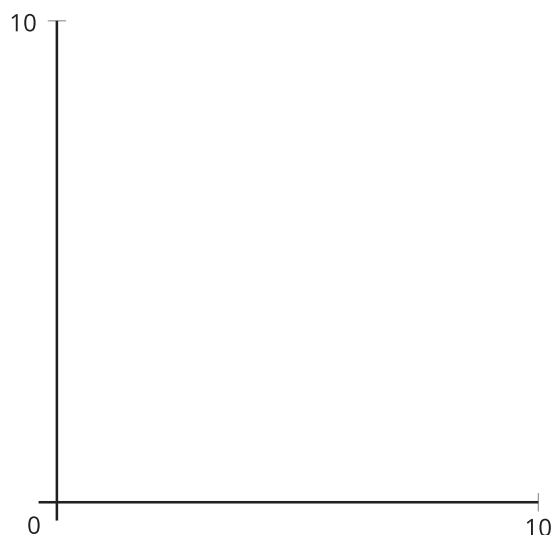


3. What do the points have in common?
4. Plot the point with coordinates (5, 0) on the coordinate grid.

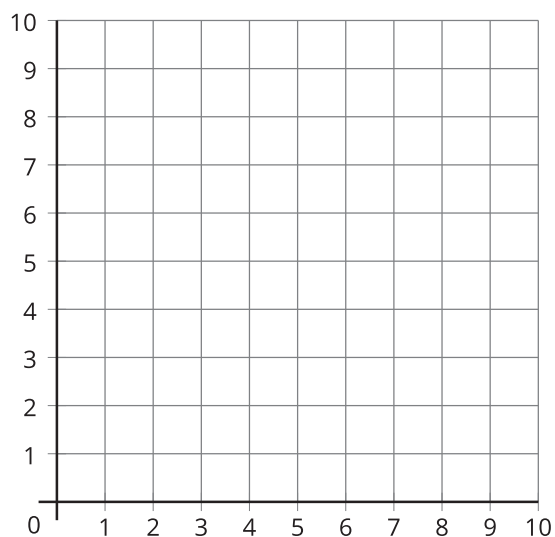
Partner B

1. Estimate the location of each point.

Point	Coordinates
<i>A</i>	(4, 3)
<i>B</i>	(5, 3)
<i>C</i>	(6, 3)
<i>D</i>	(7, 3)



2. Plot and label the points on the coordinate grid.

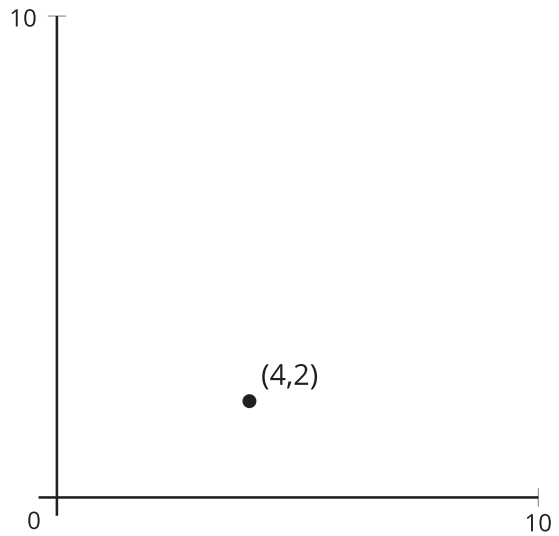


3. What do the points have in common?

4. Plot the point with coordinates (0, 3) on the coordinate grid.

3.2: Plotting Points Without a Grid

1. A point is labeled in the coordinate plane. Plot and label some other points. Explain or show your reasoning.

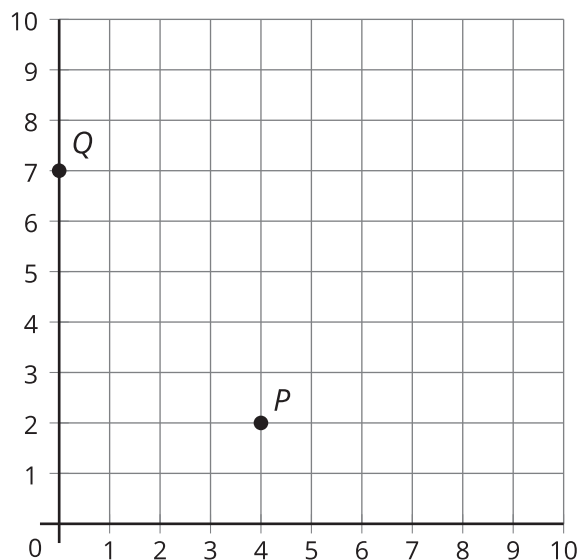


2. Can you plot (1, 0) and (0, 1) accurately? Explain or show your reasoning.

Section Summary

Section Summary

In this section, we plotted and described points on the coordinate grid.



The point P is 4 units from the vertical axis and 2 units from the horizontal axis. Its coordinates are $(4, 2)$. The point Q is 0 units from the vertical axis since it is on the vertical axis. It is 7 units from the horizontal axis. Its coordinates are $(0, 7)$.

The first coordinate of a point tells us its horizontal position and the second coordinate gives its vertical position.

Lesson 4: Sort Quadrilaterals

- Let's sort quadrilaterals.

Warm-up: What Do You Know About Quadrilaterals?

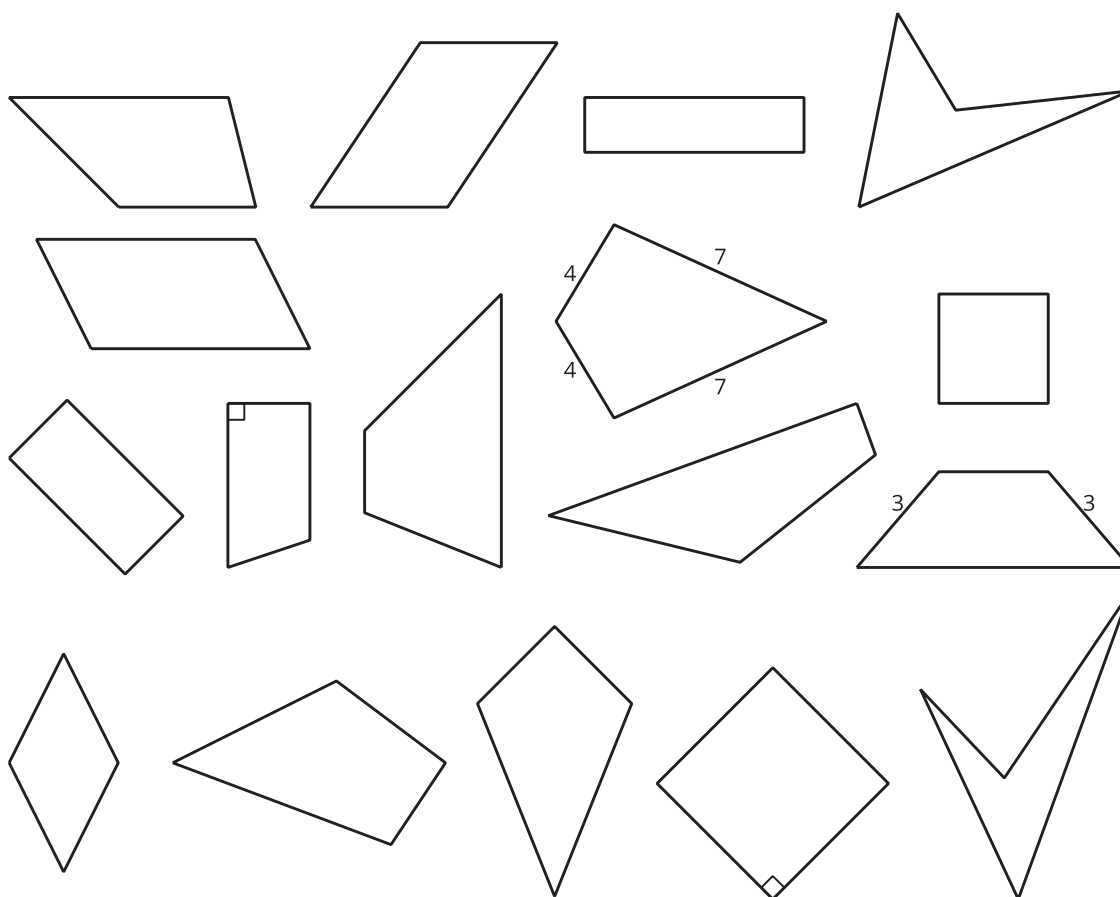
What do you know about quadrilaterals?

4.1: Guess Which One?

1. Play a round of Guess Which One.

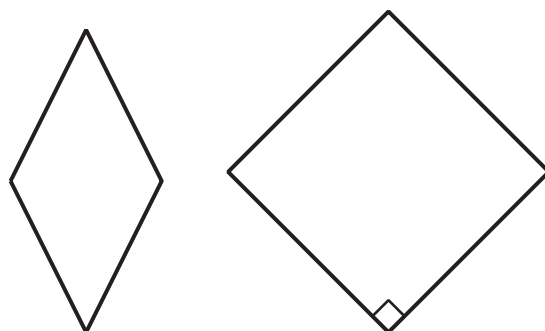
Partner A: Select one of the quadrilaterals. Do not reveal your choice to your partner.

Partner B: Ask “yes” or “no” questions to guess which shape your partner picked. After each question, cross out or remove quadrilaterals based on your partner’s answer.



Use the space to record your questions for this round.

2. Han and Mai were playing Guess Which One. These are the last two shapes. What question can Mai ask to determine which shape is the one that Han picked?



If there is time: Switch roles and play Guess Which One again.

4.2: Card Sort: Quadrilaterals

Your teacher will give you a set of cards.

1. Sort all of the quadrilateral cards in a way that makes sense to you. Name the categories in your sort.
2. Sort the quadrilateral cards in a different way and name each of the categories in your new sort.

Lesson 5: Trapezoids

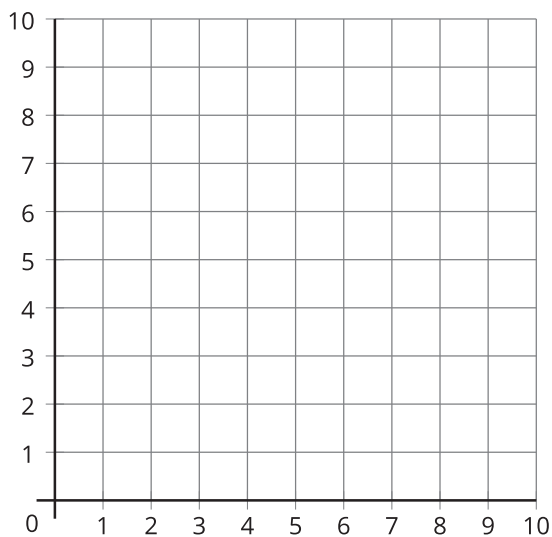
- Let's explore trapezoids.

Warm-up: What Do You Know About Trapezoids?

What do you know about trapezoids?

5.1: What's a Trapezoid?

1. Draw a trapezoid. Label the coordinates of the grid points you used.



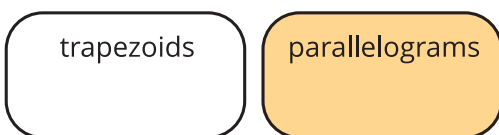
2. Is it a square? Rectangle? Rhombus? Parallelogram? Explain your reasoning.

3. Describe a trapezoid in your own words. Compare your definition with a partner.

4. Is this shape a trapezoid according to your definition? Explain your reasoning.

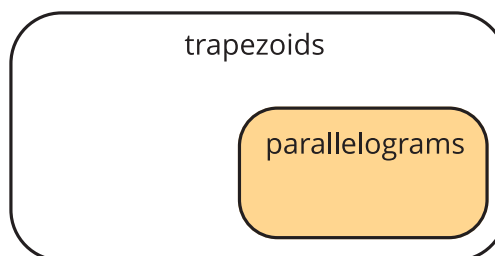


5.2: Two Definitions of a Trapezoid



Definition 1

A trapezoid has exactly one pair of opposite sides that are parallel.



Definition 2

A trapezoid has at least one pair of opposite sides that are parallel.

Which statements go with the first definition? Which statements go with the second definition? Explain or show your reasoning.

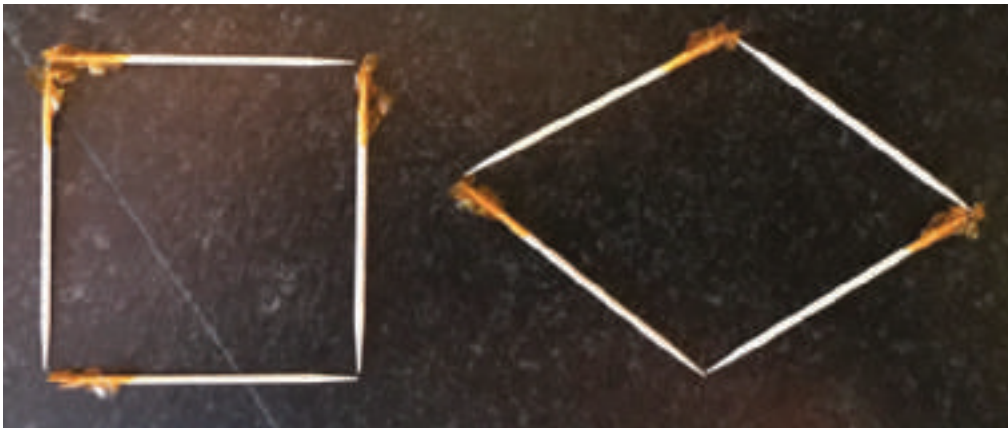
1. All parallelograms are trapezoids.
2. No parallelograms are trapezoids.
3. All trapezoids are parallelograms.
4. Some trapezoids are parallelograms.
5. No trapezoids are parallelograms.

Lesson 6: Hierarchy of Quadrilaterals

- Let's explore the hierarchy of quadrilaterals.

Warm-up: Notice and Wonder: Squares and Rhombuses

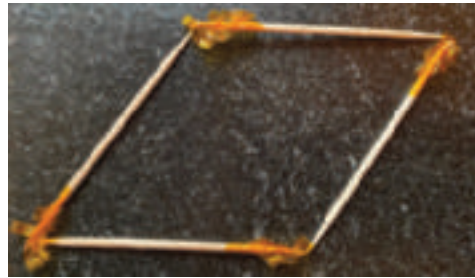
What do you notice? What do you wonder?



6.1: Shapes with Toothpicks

1. Build a square with your toothpicks. How do you know it is a square?

2. Use the same four toothpicks to build this shape. What stayed the same? What changed?



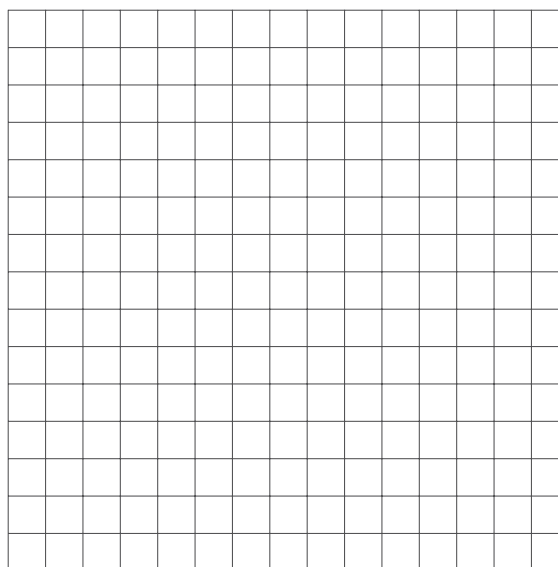
3. Build a rectangle with six toothpicks. How do you know it is a rectangle?

4. Use the same six toothpicks to build this shape. What stayed the same? What changed?



6.2: Three Quadrilaterals

1. Draw 3 different quadrilaterals on the grid, making sure at least one of them is a parallelogram.



2. For each of your quadrilaterals determine if it is a:

- square
- rhombus
- rectangle
- parallelogram

Explain or show your reasoning.

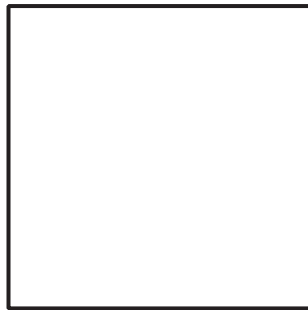
3. Draw a rhombus that is not a square. Explain or show how you know it is a rhombus but not a square.
4. Draw a rhombus that is a square. Explain or show how you know it is a rhombus and a square.
5. Diego says that it is impossible to draw a square that is not a rhombus. Do you agree with him? Explain or show your reasoning.

Lesson 7: Rectangles and Squares

- Let's learn more about rectangles and squares.

Warm-up: What Do You Know About This Shape?

What do you know about this shape?



7.1: Quadrilateral Clues

Spread out your shape cards so you and your partner can see all of them.

Work together to find a shape that fits each clue. If you don't think it is possible to find that shape, explain why. You can only use each shape one time.

1. Find a quadrilateral that is not a parallelogram.
2. Find a rhombus that is also a square.
3. Find a rhombus that is not a square.
4. Find a trapezoid that is not a rectangle.
5. Find a rectangle that is not a square.
6. Find a parallelogram that is not a rectangle.
7. Find a square that is not a rectangle.

7.2: Always, Sometimes, Never

Write always, sometimes, or never in each blank to make the statements true.

For each statement that is completed with “sometimes,” draw a figure for which the statement is true and another figure for which the statement is not true.

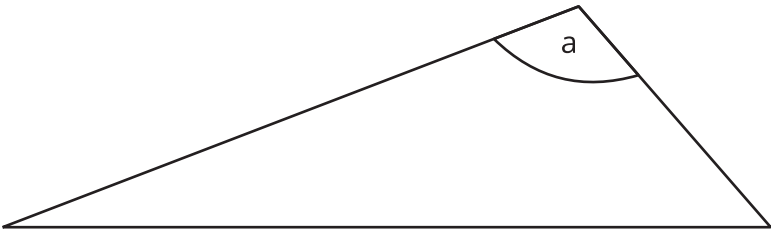
1. A rhombus is _____ a square.
2. A square is _____ a rhombus.
3. A triangle is _____ a quadrilateral.
4. A square is _____ a rectangle.
5. A rectangle is _____ a parallelogram.
6. A parallelogram is _____ a rhombus.
7. A trapezoid is _____ a parallelogram.

Lesson 8: Sort Triangles

- Let’s sort triangles.

Warm-up: Estimation Exploration: Angle Measure

What is the measure of the angle?



Record an estimate that is:

too low	about right	too high

8.1: The Right Fit

- 1. Find a triangle card that fits in each space on the grid.
- 2. If you don't think it is possible to find a triangle that fits certain criteria, explain why not.

	all three side lengths are different	exactly two of the side lengths are the same	all three side lengths are the same
has a 90 degree angle			
has an angle that is greater than 90 degrees			
all three angles are less than 90 degrees			

Explanations:

8.2: All, Some, None

1. Sort the triangle cards from the previous activity in a way that makes sense to you. Describe how you sorted the cards.

2. Now sort out the triangles with a 90 degree angle. For these triangles, write statements about each category.

- All of the triangles with a 90 degree angle...

- Some of the triangles with a 90 degree angle...

- None of the triangles with a 90 degree angle...

Section Summary

Section Summary

In this section we sorted and analyzed different kinds of quadrilaterals and triangles. We described their properties. For example:

- A rectangle is a quadrilateral with 4 right angles.
- A rhombus is a quadrilateral with 4 equal sides.
- A square is a quadrilateral with 4 right angles and 4 equal sides.

We also described how the shapes are related to each other. For example, we can see that a square is always a rhombus because it has the properties of a rhombus. A square is also always a rectangle because it has the properties of a rectangle. On the other hand, a rectangle does not need to be a square because its side lengths don't have to all be the same. And a rhombus does not need to be a square because its angles do not have to be right angles.

Lesson 9: Generate Patterns

- Let's explore rules and patterns.

9.1: What's the Pattern?

1. Jada and Priya create patterns using rules. Use each rule to complete their patterns.

Jada's rule: start with 0 and keep adding 4.

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

Priya's rule: start with 0 and keep adding 8.

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

2. If Jada and Priya continue their patterns, what number will be in Priya's pattern when Jada's pattern has:
 - a. 40
 - b. 60
3. If Jada and Priya continue their patterns, what number will be in Jada's pattern when Priya's pattern has 192?
4. What relationships do you notice between the numbers in Priya's pattern and the numbers in Jada's pattern?

9.2: More Patterns

Partner A

1. Use each rule to create a pattern.

Jada's rule: Start at 0. Keep adding 2.

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

Priya's rule: Start at 0. Keep adding 6.

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

2. If the patterns continue:

- a. What number will be in Priya's pattern when Jada's pattern has 34? Explain or show your reasoning.

- b. What number will be in Jada's pattern when Priya's pattern has 120? Explain or show your reasoning.

3. What relationships do you notice between the numbers in Priya's pattern and the numbers in Jada's pattern?

Partner B

4. Use each rule to create a pattern.

Jada's rule: Start at 0. Keep adding 3.

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

Priya's rule: Start at 0. Keep adding 9.

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

5. If the patterns continue,

a. What number will be in Priya's pattern when Jada's pattern has 54? Explain or show your reasoning.

b. What number will be in Jada's pattern when Priya's pattern has 198? Explain or show your reasoning.

6. What relationships do you notice between the numbers in Priya's pattern and the numbers in Jada's pattern?

Lesson 10: Interpret Relationships

- Let's find relationships between patterns.

Warm-up: True or False: Multiply and Divide

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $276 \div 3 = \frac{1}{3} \times 276$

- $276 \div 3 = \frac{276}{6}$

- $(276 \div 3) \times 2 = \frac{2}{3} \times 276$

10.1: Mix and Match: 3 Patterns

1. Complete the patterns for each set of rules.
2. What are some relationships between the patterns for each set of rules? Be prepared to explain your thinking.

Set A

Rule 1: Start at 0. Keep adding 3.

--	--	--	--	--

Rule 2: Start at 0. Keep adding 6.

--	--	--	--	--

Set B

Rule 1: Start at 4. Keep adding 3.

--	--	--	--	--

Rule 2: Start at 9. Keep adding 6.

--	--	--	--	--

Set C

Rule 1: Start at 0. Keep adding 5.

--	--	--	--	--

Rule 2: Start at 0. Keep adding 3.

--	--	--	--	--

10.2: Generate Patterns

Partner A

1. Generate patterns for the two rules.

Rule 1: Start with 0. Keep adding 4.

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

Rule 2: Start with 0. Keep adding 6.

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

2. Compare your patterns. What relationships do you notice?
3. What number will be in pattern 2 when the number in the pattern 1 box is 40?
4. What number will be in pattern 1 when the number in the pattern 2 box is 120?

Partner B

1. Generate patterns for the two rules.

Rule 1: Start with 0. Keep adding 2.

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

Rule 2: Start with 0. Keep adding 3.

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

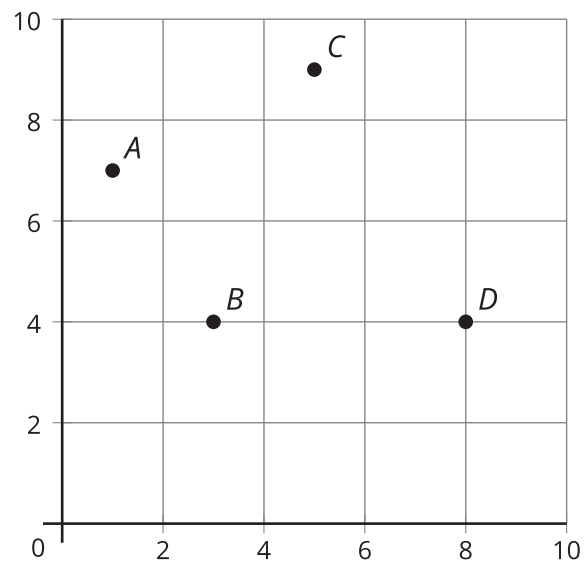
2. Compare your patterns. What relationships do you notice?
3. What number will be in pattern 2 when the number in the pattern 1 box is 30?
4. What number will be in pattern 1 when the number in the pattern 2 box is 60?

Lesson 11: Patterns and Ordered Pairs

- Let's graph patterns on the coordinate grid.

Warm-up: Notice and Wonder: The Coordinate Grid

What do you notice? What do you wonder?



11.1: Patterns on the Coordinate Grid, Part 1

Partner A

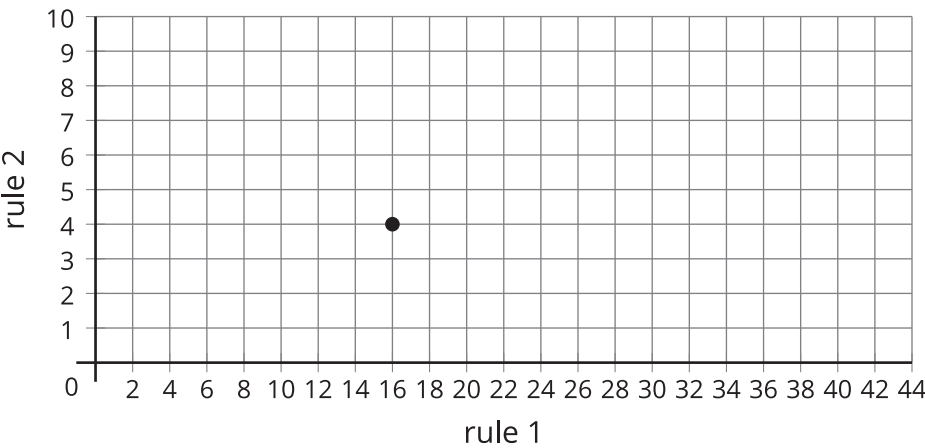
Rule 1: Start at 0. Keep adding 8.

Rule 2: Start at 0. Keep adding 2.

1. Use the rules to complete the table.

	A	B	C	D	E	F
rule 1						
rule 2						

2. Which table column represents the point on the coordinate grid? Label the point with the appropriate letter.



3. Plot and label the rest of the points.

Partner B

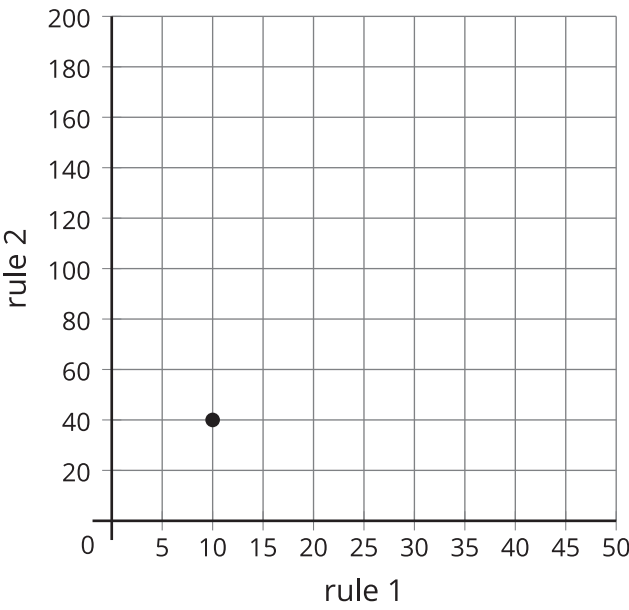
Rule 1: Start at 0. Keep adding 10.

Rule 2: Start at 0. Keep adding 40.

1. Use the rules to complete the table.

	A	B	C	D	E	F
rule 1						
rule 2						

2. Which table column represents the point on the coordinate grid? Label the point with the appropriate letter.



3. Plot and label the rest of the points.

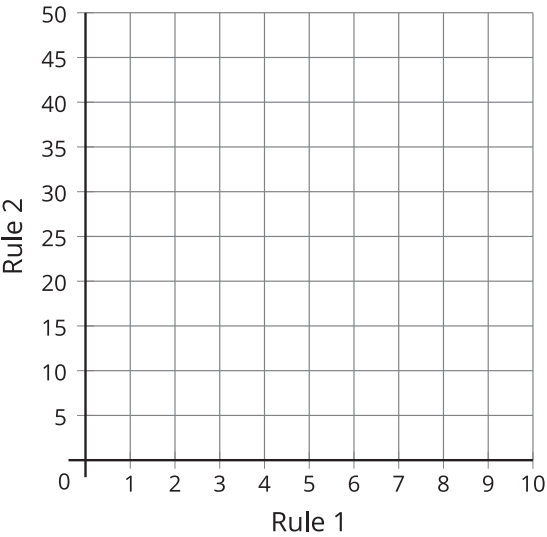
11.2: Patterns on the Coordinate Grid, Part 2

- 1. Use the rules to complete the table.
 - Rule 1: Start with 0. Add 2.
 - Rule 2: Start with 0. Add 5.

	A	B	C	D	E	F
Rule 1						
Rule 2						

- 2. What patterns do you notice between the corresponding terms of the two patterns?

- 3. Plot and label the points from the table.



- 4. What does the point *C* tell you about Rule 1 and Rule 2?

Lesson 12: Represent Problems on the Coordinate Grid

- Let's represent problems on the coordinate grid.

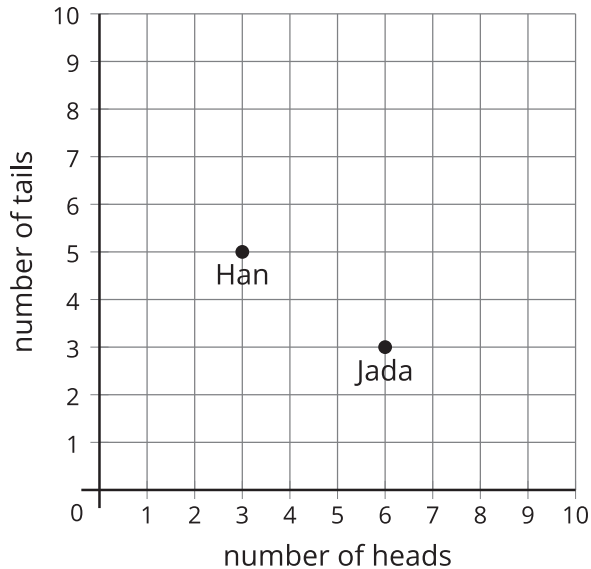
Warm-up: True or False: Addition and Multiplication

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $(2 \times 10) + (3 \times 5) = (3 \times 10) + (1 \times 5)$
- $(3 \times 25) + (5 \times 5) = 8 \times 25$
- $(4 \times 25) + (10 \times 5) = (2 \times 25) + (10 \times 10)$

12.1: Heads or Tails

Han and Jada flipped a penny several times and counted how many times it came up heads and how many times it came up tails. Their results are plotted on the graph.

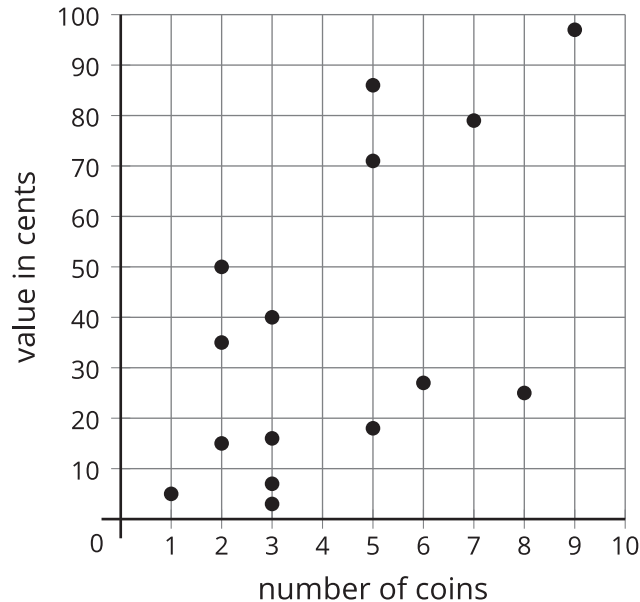


1. How many heads did Jada get? How many tails did Jada get? Explain or show how you know.
2. How many heads did Han get? How many tails did Han get? Explain or show how you know.
3. Flip the coin 10 times and record how many heads and tails you get. Plot the point on the coordinate grid that represents your coin flips.

- Grade 5 Unit 7
Lesson 12

12.2: Coin Values

The graph shows the number and value of coins some students had with them.



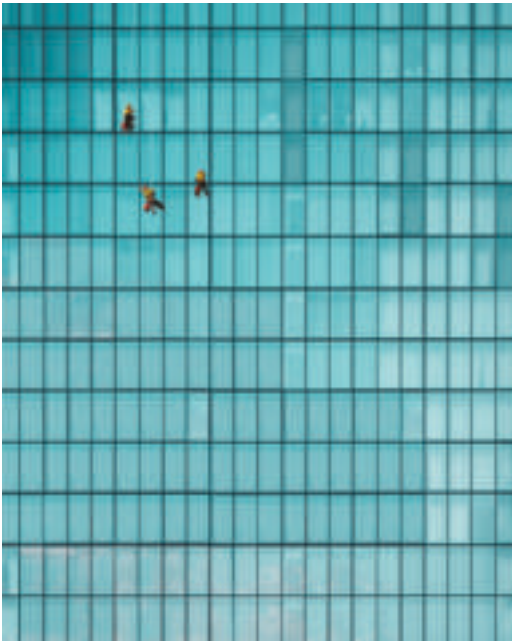
1. Tyler has 1 dime, 3 nickels, and 2 pennies. Which point represents Tyler's coins? Label the point.
2. Lin has 3 quarters, 1 dime, and 1 penny. Which point represents Lin's coins? Label the point.
3. Diego has 1 quarter and 1 dime. Write the coordinates of the point that represents Diego's coins. Explain or show your reasoning.
4. Clare has 5 coins and does not have a quarter. Write the coordinates of the point that represents Clare's coins.
5. Which coins might Clare have? Explain or show your reasoning.

Lesson 13: Perimeter and Area of Rectangles

- Let’s explore the perimeter and area of rectangles on the coordinate grid.

Warm-up: Estimation Exploration: Window Washing

What is the area of one window?

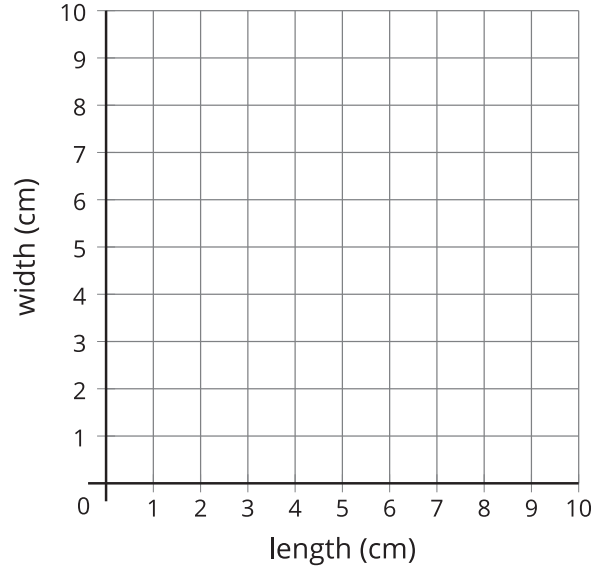


Record an estimate that is:

too low	about right	too high

13.1: Rectangle Perimeters

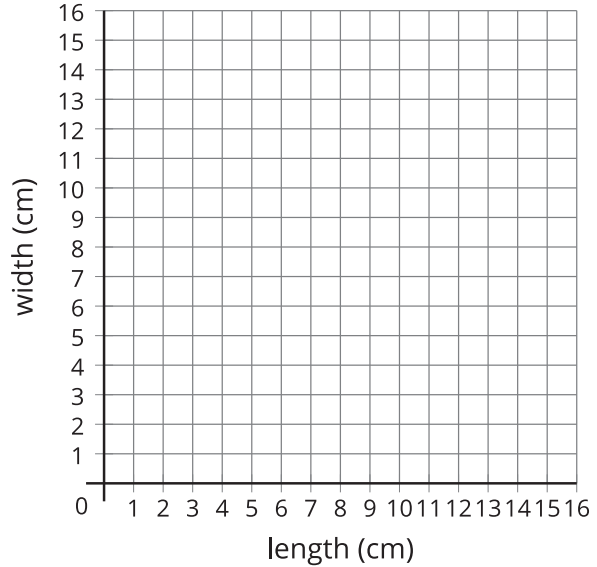
length (cm)	width (cm)



1. Jada drew a rectangle with a perimeter of 12 centimeters. What could the length and width of Jada's rectangle be? Use the table to record your answer.
2. Plot the length and width of each rectangle on the coordinate grid.
3. If Jada drew a square, how long and wide was it?
4. If Jada's rectangle was 2.5 cm long, how wide was it? Plot this point on the coordinate grid.
5. If Jada's rectangle was 3.25 cm long, how wide was it? Plot this point on the coordinate grid.

13.2: Rectangle Areas

length (cm)	width (cm)



1. Jada drew a rectangle with area 16 square centimeters. What could the length and width of Jada's rectangle be? Use the table to record your answer.
2. Plot the length and width of each rectangle on the coordinate grid.
3. If Jada's rectangle was 5 cm long, how wide was it? Plot this point on the coordinate grid.
4. If Jada's rectangle was 3 cm long, how wide was it? Plot this point on the coordinate grid.
5. If Jada drew a square, how long and wide was it? Explain how you know.

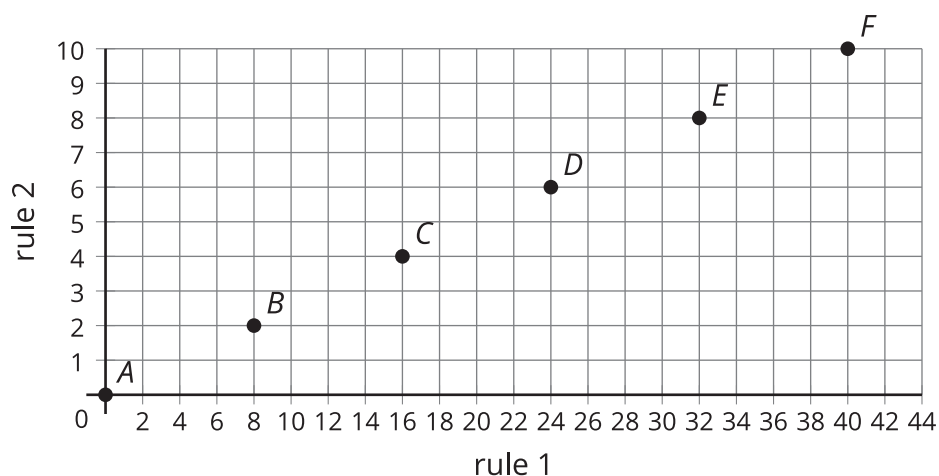
Section Summary

Section Summary

In this section, we generated patterns and recognized relationships between two different patterns.

	A	B	C	D	E	F
rule 1: Start at 0. Add 8.	0	8	16	24	32	40
rule 2: Start at 0. Add 2.	0	2	4	6	8	10

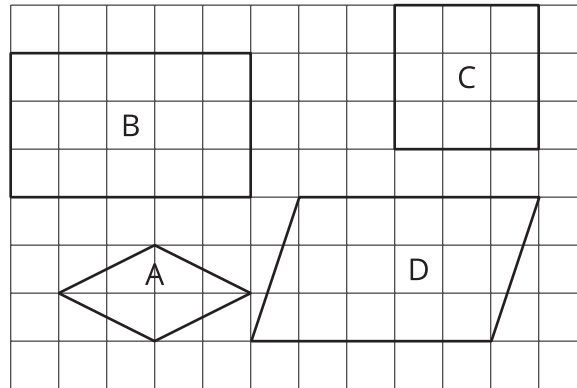
Each number in rule 1 is 4 times the value of the corresponding number in rule 2 and each number in rule 2 is $\frac{1}{4}$ times the value of the corresponding number in rule 1. We also plotted the rules together on a coordinate grid.



We also used the coordinate plane to represent other situations such as the length and width of rectangles with given area or perimeter.

Section A: Practice Problems

1. Pre-unit

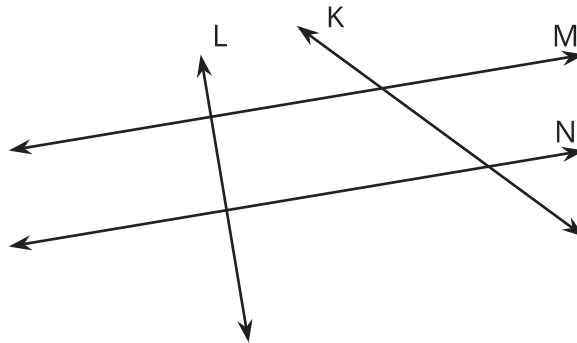


a. Which shapes are rectangles? _____

b. Which shapes are rhombuses? _____

c. Which shapes are squares? _____

2. Pre-unit

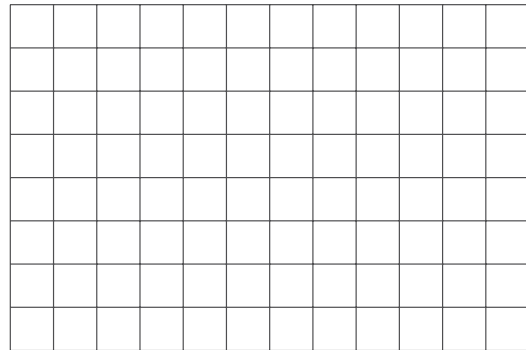


a. Name two lines in the drawing that are parallel. _____

b. Name two lines in the drawing that are perpendicular. _____

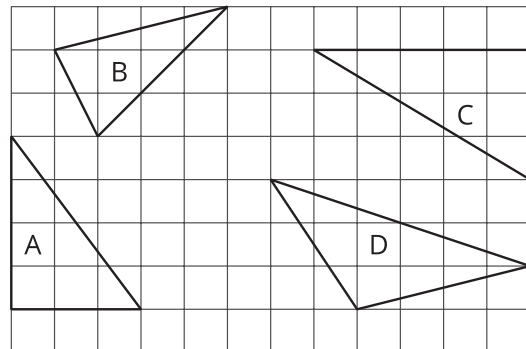
3. Pre-unit

- a. Draw a rectangle on the grid.
- b. What is the perimeter of the rectangle?

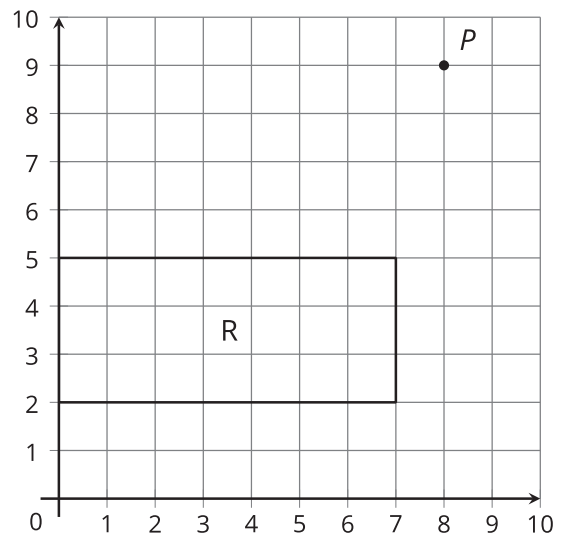


4. Pre-unit

Which of the triangles are right triangles?

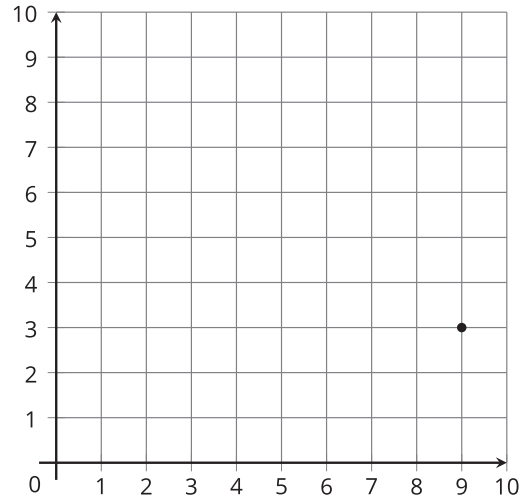


5. a. How would you describe the point labeled P ?
- b. How would you describe the rectangle R ?



(From Unit 7, Lesson 1.)

6. a. What are the coordinates of the point on the grid?



- b. Locate and label point *A* with coordinates (7, 1), point *B* with coordinates (2, 8), and point *C* with coordinates (6, 6).

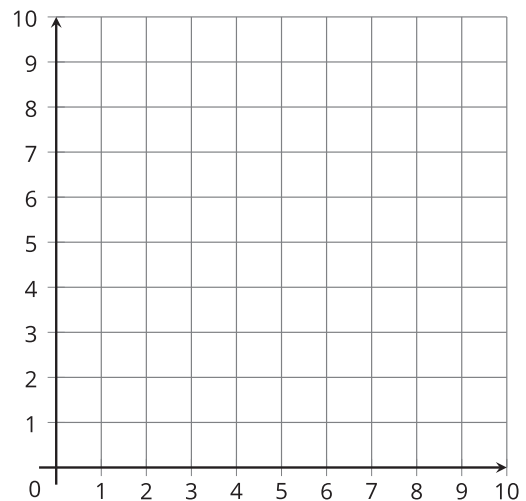
(From Unit 7, Lesson 2.)

7. a. Fill in the blanks with 4 different numbers between 0 and 10 and plot the points on the graph.

(_____, 0) (_____, 0)

(_____, 0) (_____, 0)

What do you notice about the points?

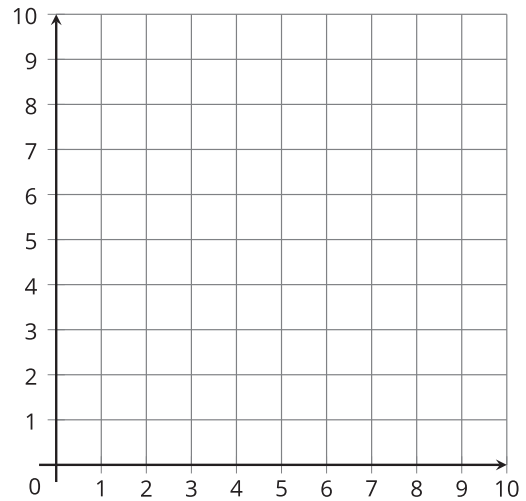


- b. Locate the points (1, 1), (2, 2), (3, 3), and (4, 4) on the graph. What do you notice about the points?

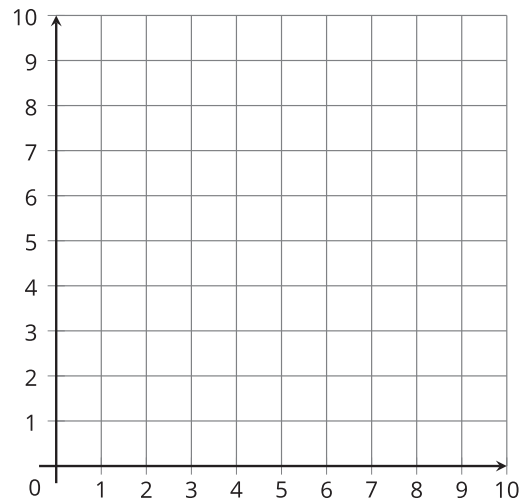
(From Unit 7, Lesson 3.)

8. Exploration

- a. One of the Illustrative Math characters describes their first initial like this:
"Start at $(2, 4)$ and go to $(2, 8)$, then go to $(3, 6)$, then to $(4, 8)$, and to $(4, 4)$."
Which character is it?



- b. Describe, using coordinates, how to trace a letter from your name.

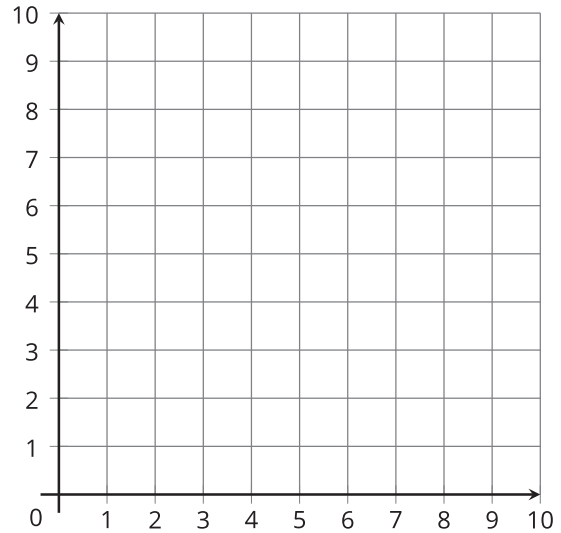


9. Exploration

Work with a partner.

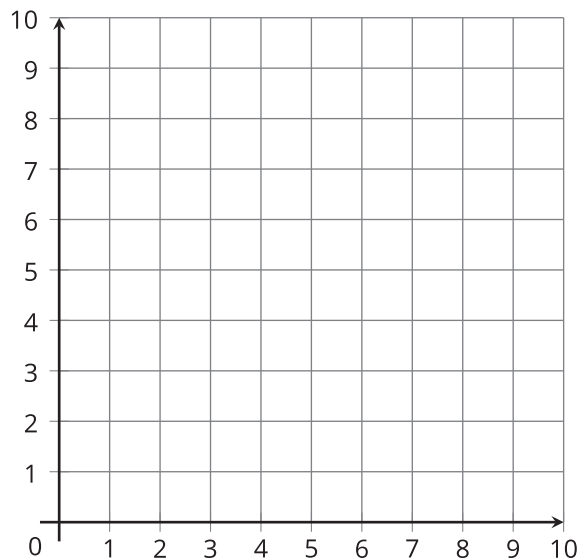
Student 1:

Draw a rectangle on the coordinate plane. Make sure the area of your rectangle is at least 20 square units. Don't show your partner your rectangle.



Student 2:

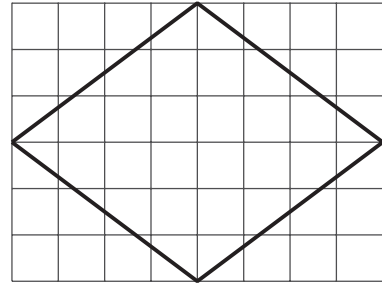
Your goal is to figure out which rectangle your partner drew. You name points in the coordinate plane and your partner will tell you whether the point is on their rectangle.



Section B: Practice Problems

1. Determine whether the statement is true or false. Explain or show your reasoning.

a. The shape is a rectangle.

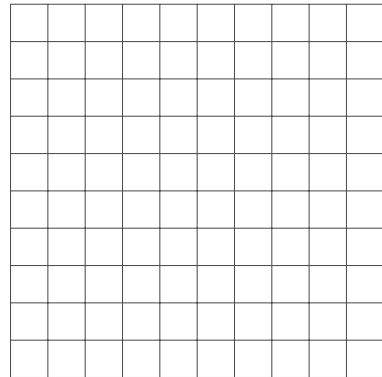
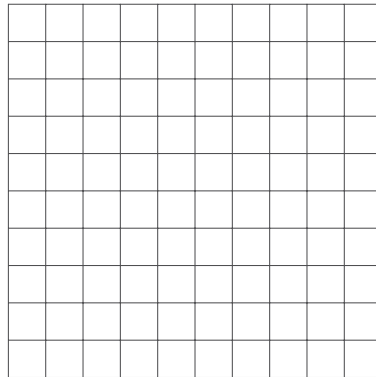


b. The shape is a square.

c. The shape is a rhombus.

(From Unit 7, Lesson 4.)

2.



a. Draw a trapezoid that is also a parallelogram. Explain how you know it is a trapezoid and a parallelogram.

b. Draw a trapezoid that is not a parallelogram. Explain how you know it is a trapezoid but is not a parallelogram.

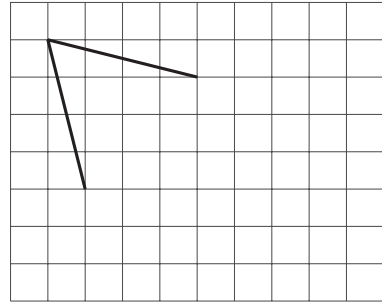
(From Unit 7, Lesson 5.)

3. Determine if you can make each given shape so that it contains these two sides.
Explain your reasoning.

a. a square

b. a rectangle

c. a rhombus



(From Unit 7, Lesson 6.)

4. Decide if each statement is true or false. Explain or show your reasoning.

a. A parallelogram is sometimes a rhombus.

b. A rhombus is always a parallelogram.

c. A trapezoid is never a rectangle.

d. A rectangle is never a square.

e. A parallelogram is always a trapezoid.

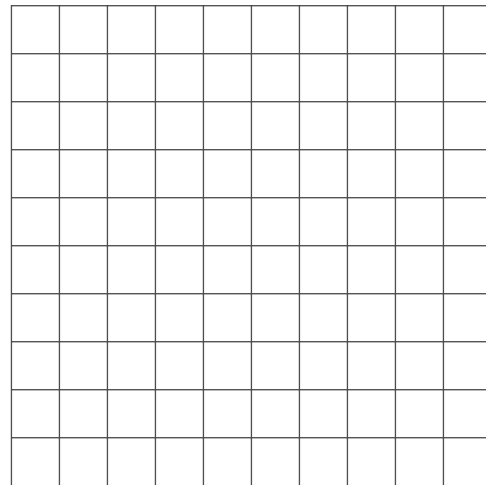
(From Unit 7, Lesson 7.)

5. For each description, draw a **right** triangle with the described side lengths on the grid or explain why there is no such right triangle.

a. 2 equal side lengths

b. 3 equal side lengths

c. 3 different side lengths



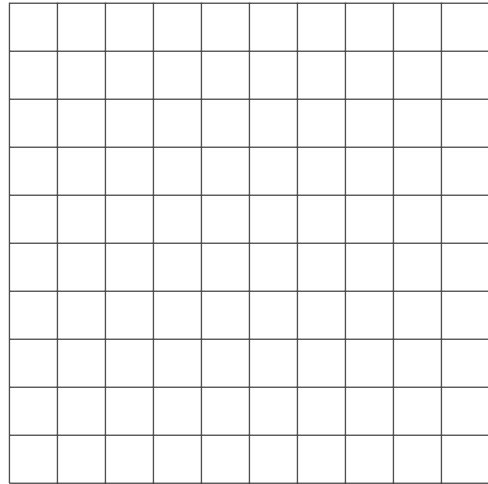
(From Unit 7, Lesson 8.)

6. Exploration

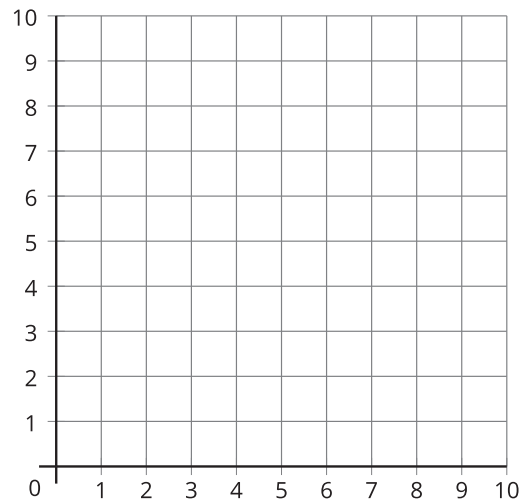
- Jada cut a quadrilateral in half, from one vertex to the opposite vertex, and she got two isosceles triangles. What kind of quadrilateral could Jada have cut in half? Explain or show your reasoning.
- Elena put together two right triangles to make a quadrilateral. What kind of quadrilateral could Elena have made? Explain or show your reasoning.

7. Exploration

- a. Can you find a square on the grid that does not have a vertical or horizontal side? Explain or show your reasoning.



- b. Draw the line segment from $(4, 4)$ to $(6, 5)$. Can you find a square that contains this segment as one of its sides?



Section C: Practice Problems

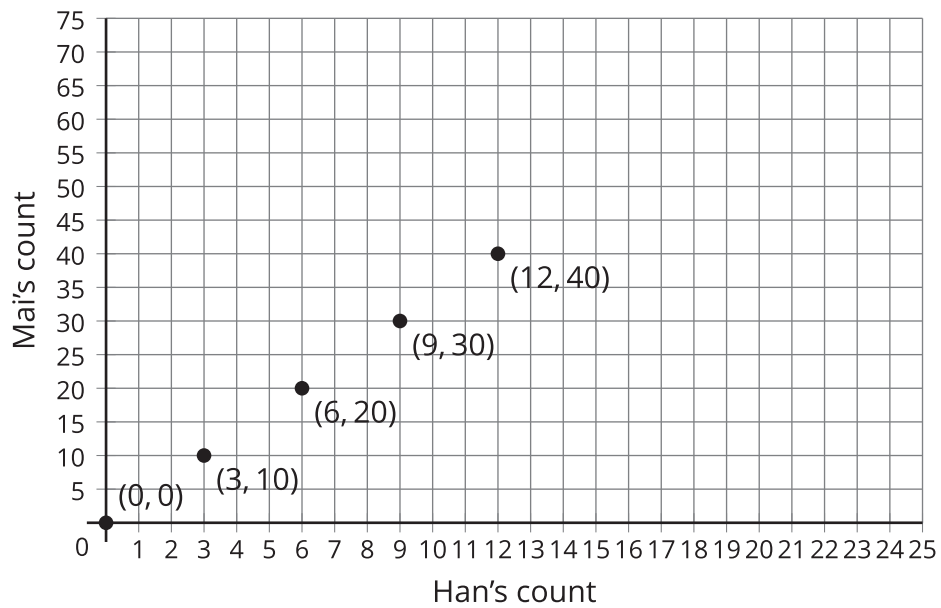
1.
 - a. List the first ten numbers starting at 0 and counting by 5s.
 - b. List the first ten numbers starting at 0 and counting by 10s.
 - c. What patterns do you observe between your two lists of numbers?

(From Unit 7, Lesson 9.)

2.
 - a. List the first ten numbers starting at 0 and counting by 6.
 - b. List the first ten numbers starting at 4 and counting by 6.
 - c. When the first list has the number 222, what number will be on the second list? Explain or show your reasoning.

(From Unit 7, Lesson 10.)

3. The points on the graph, starting in the bottom left and moving up and to the right, represent how Han and Mai counted.



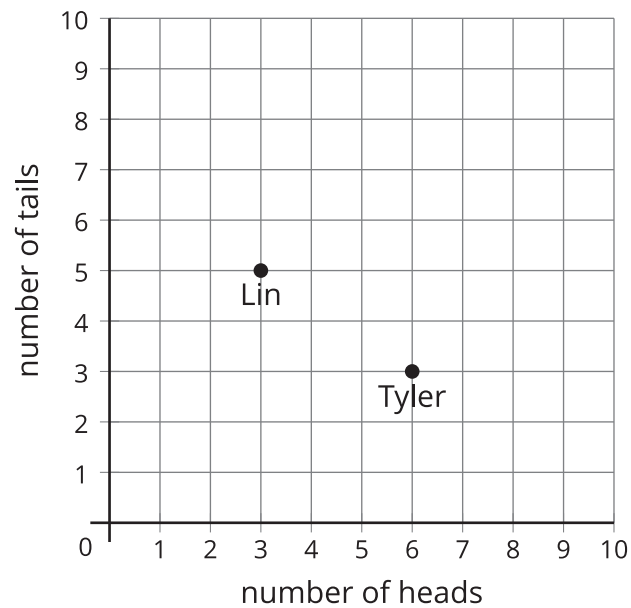
a. How much is Han adding each time in his count? Explain how you know.

b. How much is Mai adding each time in her count? Explain you know.

c. Name and locate 3 more points on the graph.

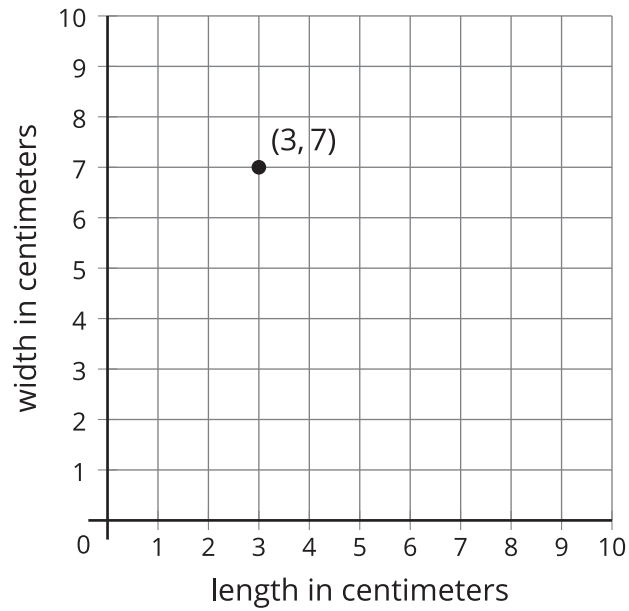
(From Unit 7, Lesson 11.)

4. The points on the graph show the results Lin and Tyler got when they tossed a coin.



- a. Who tossed the coin more times, Lin or Tyler? Explain or show your reasoning.
- b. Who got more tails, Lin or Tyler? Explain or show your reasoning.
- c. Toss a coin 7 times and plot the point on the graph. Explain or show your reasoning.

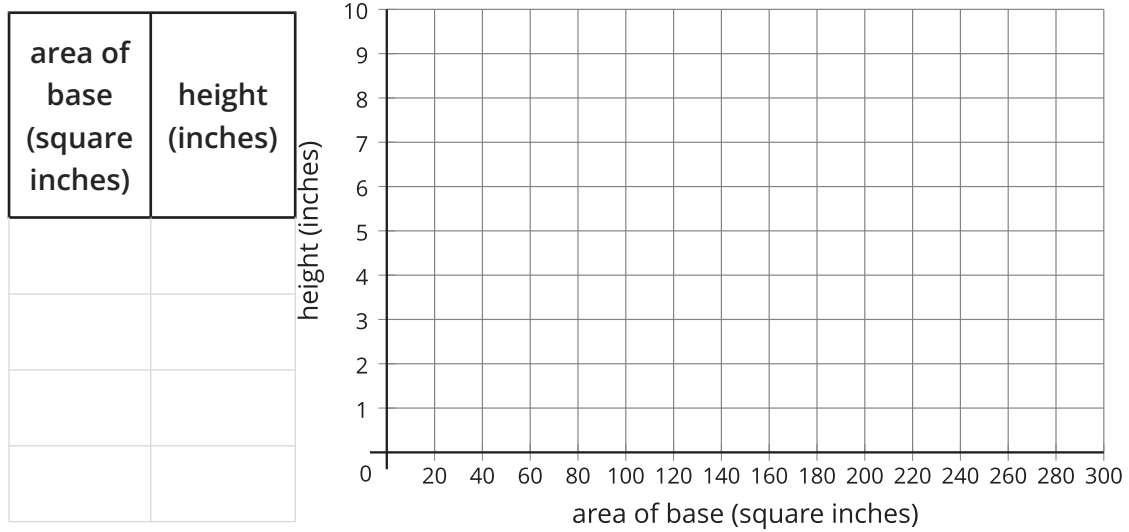
(From Unit 7, Lesson 12.)



5. a. The point on the graph shows the length and width of a rectangle. What is the perimeter of the rectangle?
- b. Plot 4 more points for different rectangles with the same perimeter as the given rectangle.
- c. Which point would represent a square with the same perimeter as the given rectangle?

(From Unit 7, Lesson 13.)

6. Exploration



- The volume of a box is 240 cubic inches. List some possible values for the area of the base of the box and for its height in the table.
- Plot several different possible area and height pairs on the graph.
- What do you notice about the points on the graph?
- Which point do you think represents the most reasonable measurements for the box? Explain your reasoning.

7. Exploration

- Andre starts from 2 and counts by 6s.
- Clare starts at 1,000 and counts back by 7s.

a. List the first 6 numbers Andre and Clare say.

b. Do Andre and Clare ever say the same number in the same spot on their lists? Explain or show your reasoning.

Credits

CKMath K–8 was originally developed by Open Up Resources and authored by Illustrative Mathematics, <https://www.illustrativemathematics.org>, and is copyrighted as 2017–2019 by Open Up Resources. It is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0). The Open Up Resources K–8 Math Curriculum is available at: <https://www.openupresources.org/math-curriculum/>.

Adaptations and updates to the IM K–8 Math English language learner supports are copyright 2019 by Open Up Resources and licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0),

Adaptations and updates to IM K–8 Math are copyright 2019 by Illustrative Mathematics, including the additional English assessments marked as "B", and the Spanish translation of assessments marked as "B". These adaptations and updates are licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

This particular work is based on additional work of the Core Knowledge® Foundation (www.coreknowledge.org) made available through licensing under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Illustration and Photo Credits

Artisticco LLC / Alamy Stock Vector: Cover B

Illustrative Math K–8 / Cover Image, all interior illustrations, diagrams, and pictures / Copyright 2019 / Licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

These materials include public domain images or openly licensed images that are copyrighted by their respective owners, unless otherwise noted/credited. Openly licensed images remain under the terms of their respective licenses.



CKMath™
Core Knowledge **MATHEMATICS™**

CKMath™
Core Knowledge MATHEMATICS™

A comprehensive program for mathematical skills and concepts
as specified in the **Core Knowledge Sequence**
(content and skill guidelines for Grades K–8).

Core Knowledge MATHEMATICS™
units at this level include:

Finding Volume
Fractions as Quotients and Fraction Multiplication
Multiplying and Dividing Fractions
Wrapping Up Multiplication and Division
with Multi-Digit Numbers
Place Value Patterns and Decimal Operations
More Decimal and Fraction Operations
Shapes on the Coordinate Plane
Putting it All Together

www.coreknowledge.org

Core Knowledge Curriculum Series™

ISBN: 979-8-88970-902-2