Materials List:

- Multiply or Divide by 4 Sprint
- Line plot (template 1)
- Ruler
- Data chart from Lessons 20-21
- Line plot from Lesson 19
- Scissors
- 11 inch string
- Rectangles (template 2)

Eureka Math

3rd Grade
Module 7
Lesson 22

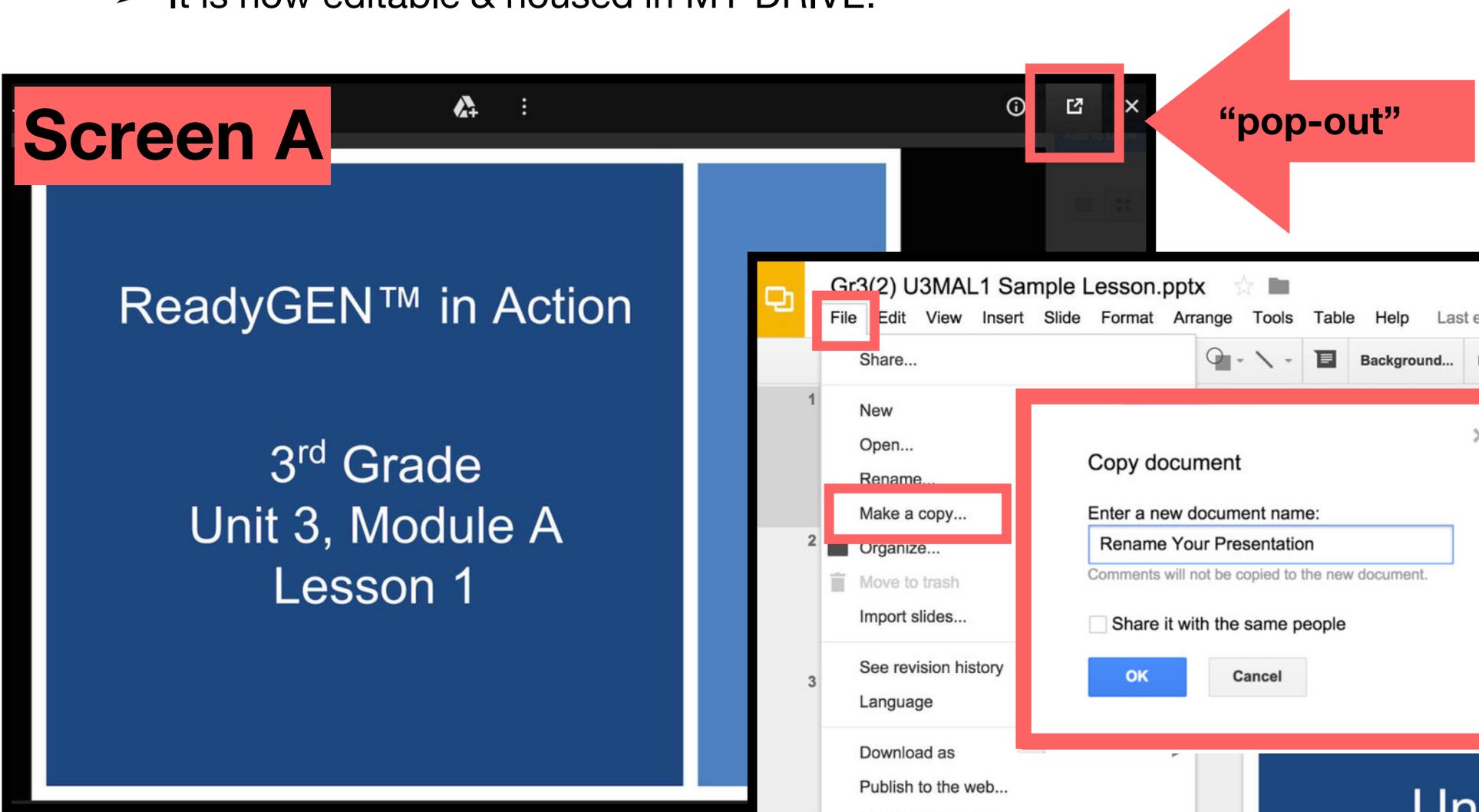
At the request of elementary teachers, a team of Bethel & Sumner educators met as a committee to create Eureka slideshow presentations. These presentations are not meant as a script, nor are they required to be used. Please customize as needed. Thank you to the many educators who contributed to this project!

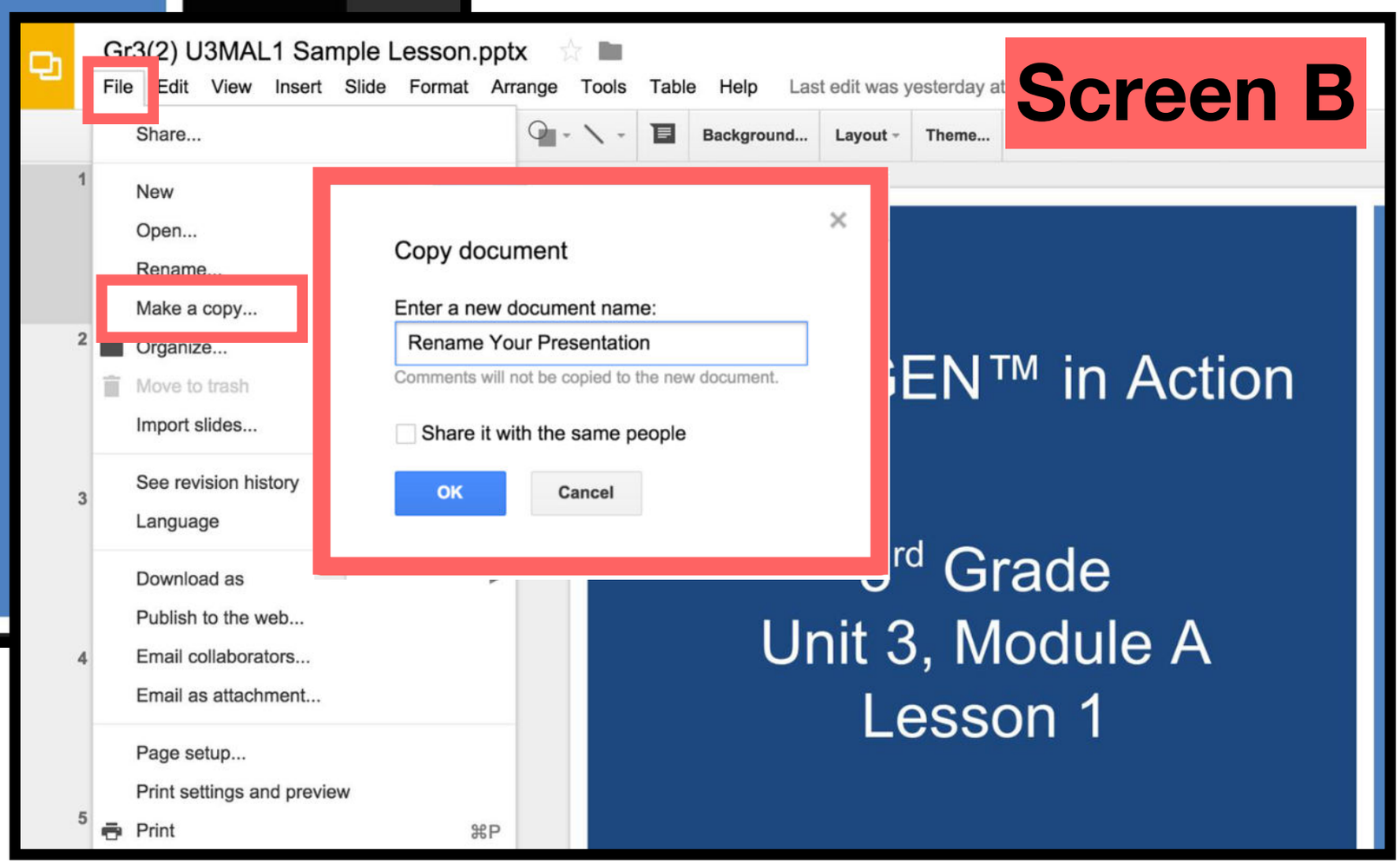
Directions for customizing presentations are available on the next slide.

Customize this Slideshow

Reflecting your Teaching Style and Learning Needs of Your Students

- When the Google Slides presentation is opened, it will look like Screen A.
- Click on the “pop-out” button in the upper right hand corner to change the view.
- The view now looks like Screen B.
- Within Google Slides (not Chrome), choose FILE.
- Choose MAKE A COPY and rename your presentation.
- Google Slides will open your renamed presentation.
- It is now editable & housed in MY DRIVE.



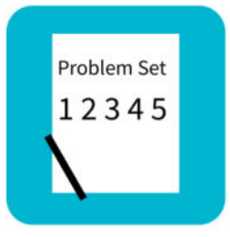


Icons

Read, Draw, Write

Learning Target

Personal White Board

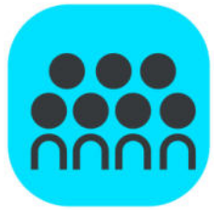


Problem Set

Manipulatives Needed

Fluency

Think Pair Share



Whole Class

Individual

Partner

Small Group

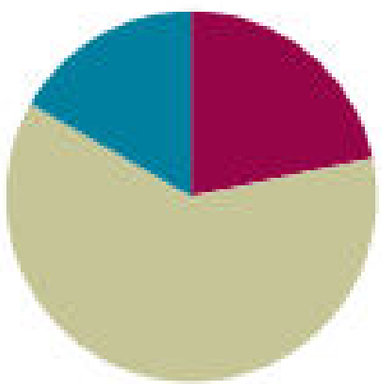
Small Group Time

Lesson 22

Objective: Use a line plot to record the number of rectangles constructed in Lessons 20 and 21.

Suggested Lesson Structure

Fluency Practice	(13 minutes)
Concept Development	(37 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Objective: Use a line plot to record the number of rectangles constructed in Lessons 20 and 21.

Fluency Practice

Multiply or Divide by 4 (10 minutes)

A

Number Correct: _____

Multiply or Divide by 4

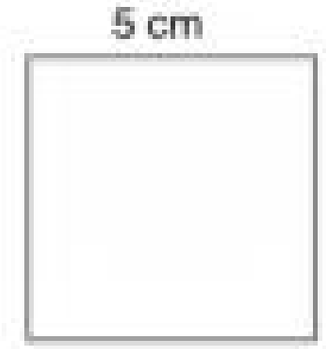
1.	2 × 4 =	
2.	3 × 4 =	
3.	4 × 4 =	
4.	5 × 4 =	
5.	1 × 4 =	

23.	___ × 4 = 40	
24.	___ × 4 = 8	
25.	___ × 4 = 12	
26.	40 ÷ 4 =	
27.	20 ÷ 4 =	

Fluency Practice

Find the Perimeter and Area (3 minutes)

This shape is a square. On your personal white board, calculate the perimeter using an addition sentence.



5 cm + 5 cm + 5 cm + 5 cm = 20 cm

Calculate the area using a multiplication sentence.

5 cm × 5 cm = 25 sq cm.

Repeat this process for the remaining rectangles.

Concept Development

Problem 1: Draw a line plot representing measurement data.

Guide students through the process of recording the number of rectangles they made for each given perimeter on the line plot in Problem 1 of the Problem Set.

- Use a ruler to partition equal intervals.
- Label the number line to show the different perimeters.
- Record the data on the line plot using X’s to represent one rectangle.

Concept Development

Problem 2: Observe and interpret data on a line plot.

Each pair will get a 11-inch-long piece of string to each pair.

Use your ruler to measure the length of the string in inches.
How long is the string?

Work with your partner to shape your string into a rectangle.

What is the perimeter of your rectangle? How do you know?

Is 11 an odd or even number?

So, do all rectangles have an even perimeter?

Concept Development

Problem 2: Observe and interpret data on a line plot.

Use your ruler to measure the side lengths of your rectangle to the nearest quarter inch.

Are the side lengths of your rectangle whole numbers?

No. They have fractions of inches!

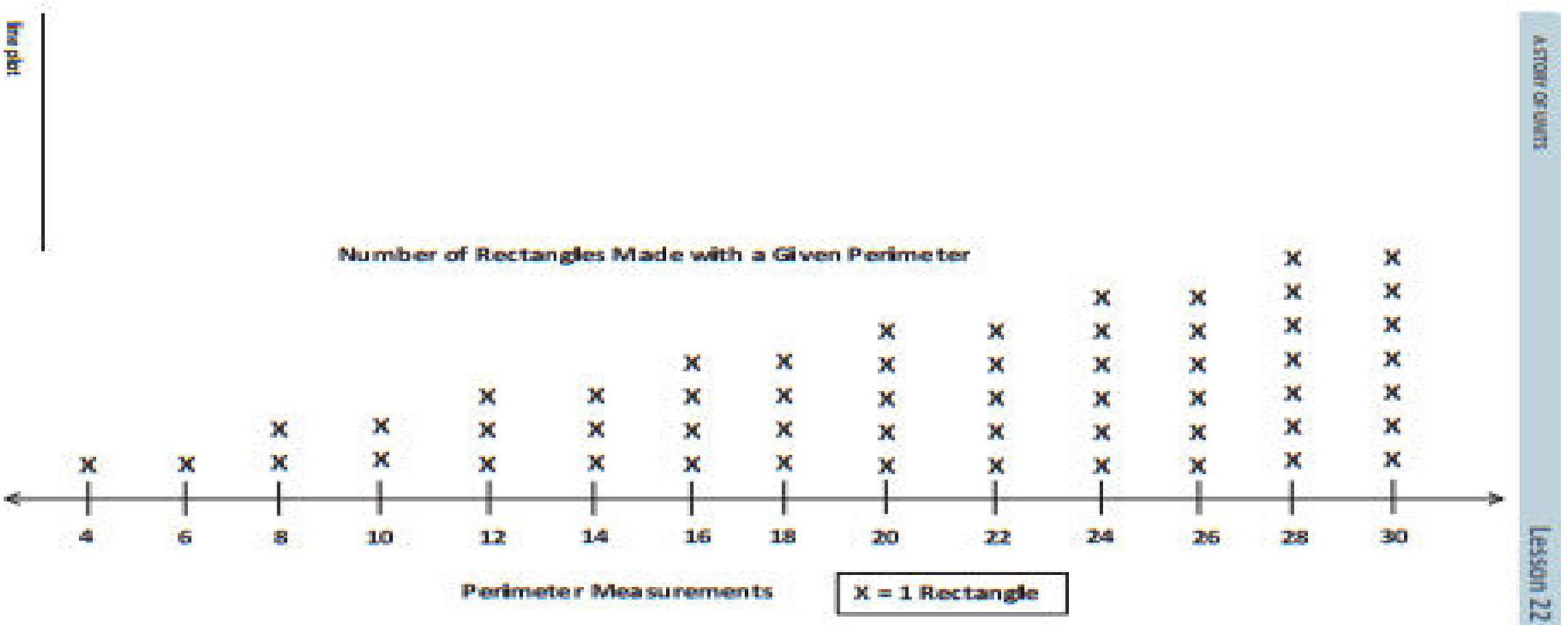
That’s right! Your rectangle has an odd perimeter because the side lengths aren’t whole numbers. Use this information to help you answer Problem 2.

Now, study the data on your line plot. Think of a true statement to share about the data.

Concept Development

Problem 2: Observe and interpret data on a line plot.

Let me show you what the line plot looks like with more measurements.
What pattern do you notice in the data?

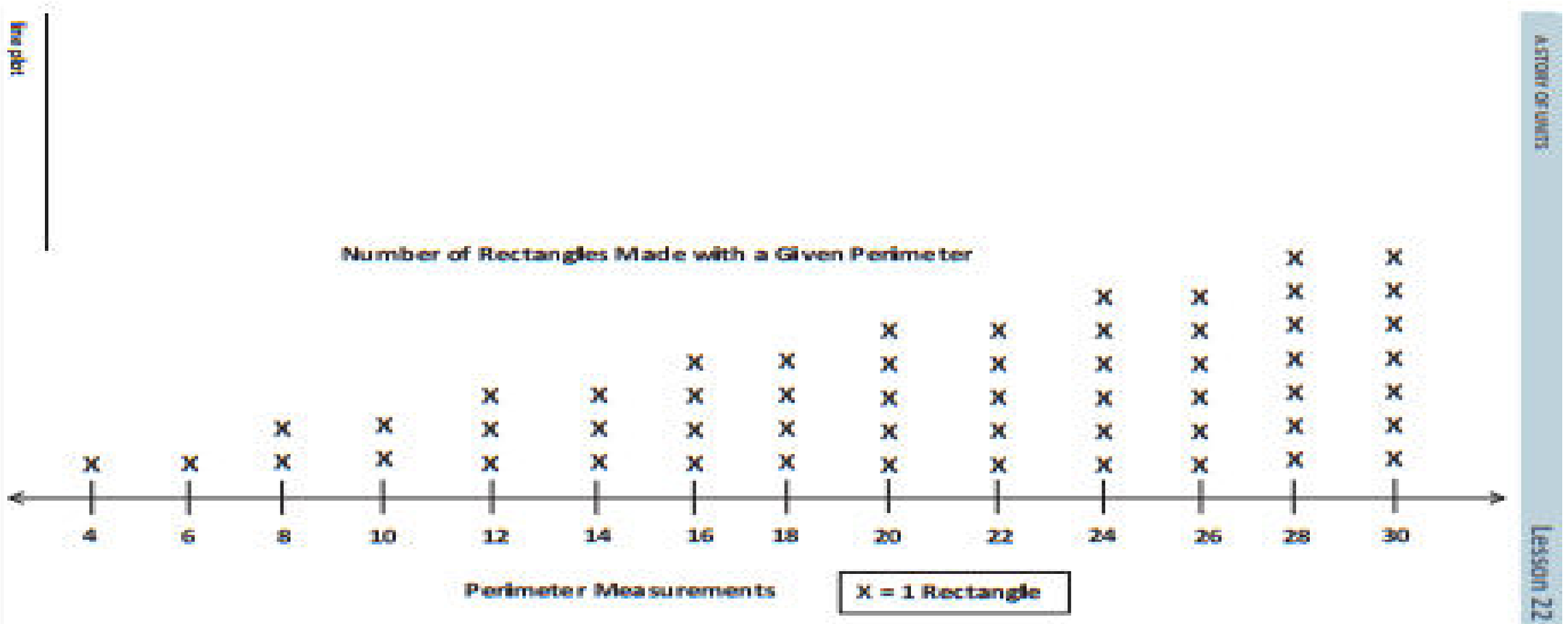


Starting with 8, the number of rectangles grows for every other measurement. Not just that, but they grow in pairs.

Concept Development

Problem 2: Observe and interpret data on a line plot.

Using this pattern, how many rectangles do you think you could build with unit squares, given perimeters of 32 units and 34 units?



Both would be 8 rectangles since each pair of measurements grows by 1.

Concept Development

Problem 2: Observe and interpret data on a line plot.

Use your ruler to help you cut an inch off your string.

How long is your string now?

10 inches

(Pass out Template 2)

Working with your partner, use your string to measure the perimeters of these rectangles.

What did you notice about the perimeters of these rectangles?

They’re all 10 inches!

Concept Development

Problem 2: Observe and interpret data on a line plot.

Use your ruler to measure the side lengths of Rectangle A to the nearest quarter inch.

Are the side lengths of this rectangle whole numbers?

No. They have fractions of inches.

On your line plot, it shows that you only made two rectangles with a perimeter of 10, but here we have four rectangles with a perimeter of 10. When we have side lengths that are not whole numbers, we can find more rectangles for given perimeters than our line plot shows.

Concept Development

Problem 3: Compare area and perimeter line plots.

Let's compare today's line plot with the one you created in Lesson 19.
How are the line plots different?
One line plot shows the number of rectangles for a given area. The other shows the number of rectangles for a given perimeter.
Look at the data on both line plots for 12. What do you notice?
There is an equal number of rectangles that we made for that perimeter and that area.
Is that true for other numbers on your line plots?
No!
Do you think there's a connection between the number of rectangles you built for a given area and perimeter?
There's not really a pattern, so there's not a relationship.
Right. Using our data, we can't make a general rule about a connection between perimeter and area.

Concept Development

Problem 3: Compare area and perimeter line plots.

Take some time to record your thoughts in Problem 3.

Compare the two line plots we created. Is there any reason to think that knowing only the area of a rectangle would help you to figure out its perimeter or knowing only the perimeter of a rectangle would help you figure out its area?

Problem Set (5 minutes)

Students should do their personal best to complete Problems 4 and 5 within the allotted 10 minutes.

4. Sumi uses unit square tiles to build 3 rectangles that have an area of 32 square units. Does knowing this help her find the number of rectangles she can build for a perimeter of 32 units? Why or why not?

5. George draws 3 rectangles that have a perimeter of 14 centimeters. Alicia tells George that there are more than 3 rectangles that have a perimeter of 14 centimeters. Explain why Alicia is correct.

Debrief (10 minutes)

- How did using a ruler help you partition your number line evenly?
- How does a line plot make data easier to read and compare?
- Share your answers to Problem 4.
- Did you agree with Alicia in Problem 5? Why or why not?
- What did using the string in today's lesson help you discover about perimeter?
- What do you notice about the connection between area and perimeter?

Exit Ticket (3 minutes)

Name _____ Date _____

Suppose you have a rectangle with a perimeter of 2 cm. What can you conclude about the side lengths? Can all 4 sides of the rectangle measure a whole number of centimeters?