Eureka Acceleration Tool: Grade 6
Module 1, Topic B

To become mathematically proficient, students **must** access on-grade-level content. This document aims to help teachers who use the Eureka curriculum to ensure readiness for students before and during on-grade-level work, creating opportunities for timely support directly connected to the new learning.

About this Topic

Focus Standards:

6.RP.A.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

Topic Overview per the Eureka Curriculum

With the concept of ratio equivalence formally defined, students explore collections of equivalent ratios in real-world contexts in Topic B. In Lessons 9 and 10, students build ratio tables and study and articulate their additive and multiplicative structure (**6.RP.A.3a**). In Lesson 11, students answer comparative questions about two distinct ratios using reasoning with ratio tables. Students continue to apply reasoning to solve ratio problems while they explore other representations of collections of equivalent ratios and relate those representations to their experience working with the ratio table (**6.RP.A.3**).

Building on their experience with number lines, students represent collections of equivalent ratios with a double number line model in Lesson 12. In Lesson 13, they relate ratio tables to equations using the value of a ratio defined in Topic A. Finally, students expand their experience with the coordinate plane (**5.G.A.1**, **5.G.A.2**) as they represent collections of equivalent ratios by plotting the pairs of values on the coordinate plane in Lesson 14. In the final lesson of this topic, students begin to synthesize their experience of the various representations by working a variety of ratio problems and choosing the representation that best represents their thinking. They continue to apply their understanding of the representations as they apply them to rate and percent problems in Topics C and D.

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Overview

Eureka Acceleration Tools include:

1. a diagnostic assessment to help teachers determine the misunderstandings or gaps in mathematical knowledge related to a specific Topic in the Eureka curriculum
2. guidance for teachers to analyze student work on the diagnostic assessment
3. suggested materials for targeted remedial instruction

Note: The use of this guidance is not intended to delay students' engagement with on-grade-level learning. On-grade-level learning should be the focus of instructional time and be treated as an opportunity for students to "finish" learning previous skills and deepen conceptual understanding.

Diagnostic Assessment

The diagnostic assessment is designed to be administered to targeted students prior to beginning instruction on the given Topic. It is broken into parts (Part A, Part B, and so on); each part addresses a different prerequisite standard and contains three problems. If a student correctly answers at least 2 out of the 3 problems, it can be assumed that he/she is ready to engage with the new content of the Topic with little to no support needed prior to engaging with the Topic. The diagnostic assessment is designed in this way so that teachers can determine the "entry point" to remedial instruction and/or opportunities for unfinished learning within the context of the new learning. The entry points and opportunities for unfinished learning will vary between students.

Guidance for Acceleration

The Acceleration Guidance is designed for teacher use. It is also broken into parts (Part A, Part B, and so on) and correlates to the parts on the diagnostic assessment. Each part contains the following:

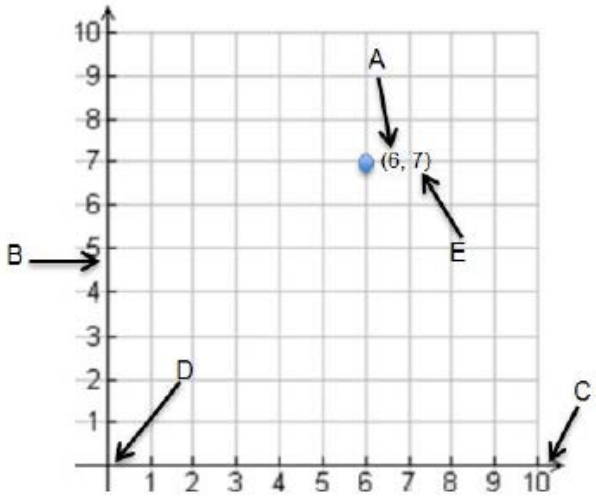
1. **The focus standard**: The focus standards are strategically chosen to address prerequisite skills and are purposefully arranged in the order that students typically master the skills and knowledge.
2. **Why this is important for current grade level work**: This section describes how the work of the prerequisite standard relates to the standard(s) addressed in the Topic of instruction.
3. **Using the diagnostic assessment to identify gaps**: This section identifies common errors students make on the diagnostic assessment items.
4. **Acceleration Resources for Targeted Instruction**: The resources pinpoint specific Eureka lessons and parts of lessons for teachers to use to address gaps in mathematical knowledge. Using Eureka materials to address acceleration ensures alignment to the standards, consistency in approach to learning, and similarities in strategies for solving problem

Part A: 5.G.A.1

1. Label the parts of the coordinate plane below. Write the corresponding terms on the lines provided as labeled by the letters. Use the word bank to help you.

A. _____
B. _____
C. _____
D. _____
E. _____

Word Bank
Origin
X-Axis
Y-Axis
X-Coordinate
Y-Coordinate

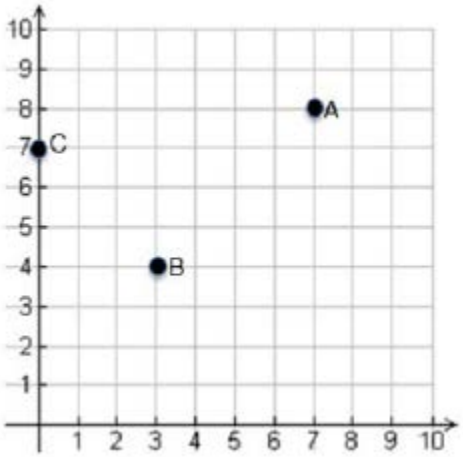


2. Identify the coordinates for each point plotted on the coordinate plane below.

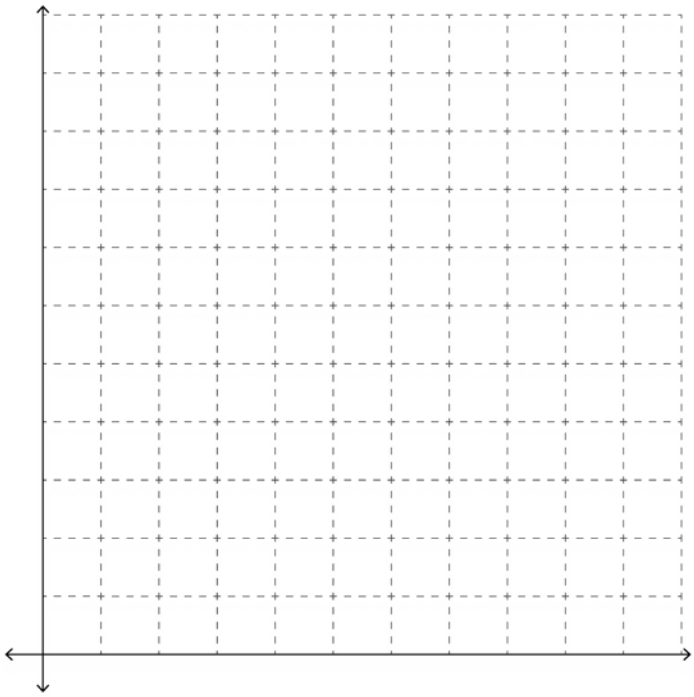
A. _____

B. _____

C. _____



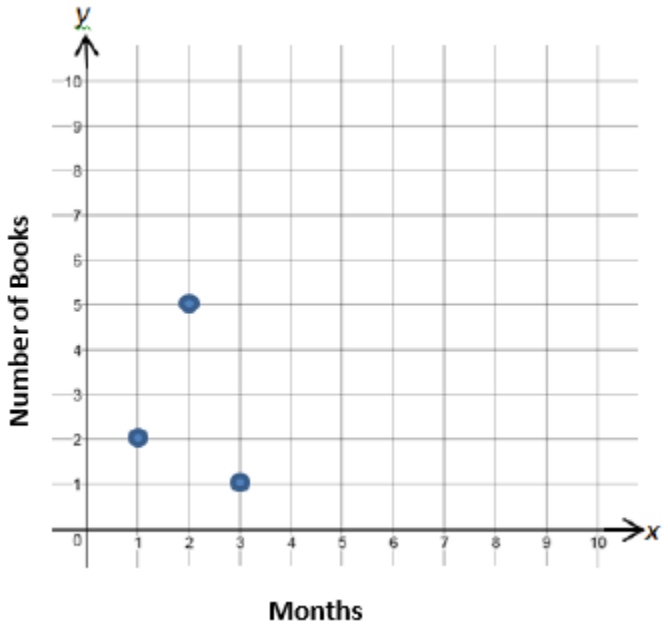
3. Plot and label the following points.
    a. Point A (4, 10)
    b. Point B (0, 0
    c. Point D (8, 0)



Part B: 5.G.A.2

Use the information and graph below to answer questions 4-6.

Judah's mom is worried that he's not reading enough, so she asks him to keep track of the number of books he reads each month. Judah uses the graph below to keep track of the number of books he reads each month.



4. What does the point (2, 5) represent?

5. If Judah reads zero books in the 5th month, what ordered pair would he need to graph?

6. Judah realized he read two more books in the 3rd month than is represented on his graph. What order pair does Judah need to graph to correct his mistake?

Part C: 5.OA.B.3

7. Use the table below to generate the following patterns.

For Pattern 1, use the rule: start at 0 and add 4

For Pattern 2, use the rule: start at 0 and add 8

Pattern 1					
Pattern 2					

8. Consider the following patterns. Explain how the corresponding terms from each pattern relate to one another.

Pattern 1: 0, 3, 6, 9, 12

Pattern 2: 0, 9, 18, 27, 36

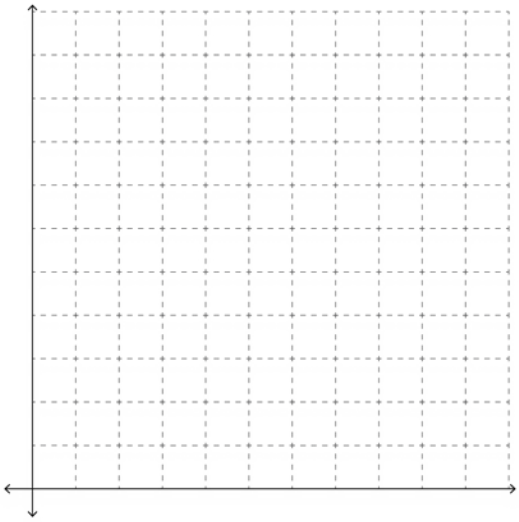
_____

_____

_____

9. Determine at least four ordered pairs consisting of corresponding terms from the two patterns and graph the ordered pairs on the coordinate plane provided.

Pattern 1	0	2	4	6	8
Pattern 2	0	6	12	18	24



Solutions:

1. A. x-coordinate
   B. y-axis
   C. x-axis
   D. origin
   E. y-coordinate

2. (7, 8), (3, 4), (0, 7)

3. Points should be plotted in the correct location on the coordinate plane.

4. Judah read 5 books in the 2nd month.

5. (5, 0)

6. (3, 3)

7.

0	4	8	12	16
0	8	16	24	32

8. (Sample) The terms in Pattern 2 are always three times as much as their corresponding terms in Pattern 1.

9. Answers will vary

Part A Focus: 5.G.A.1: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number in the ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number in the ordered pair indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g. x-axis, and x-coordinate, y-axis and y-coordinate).

Why this is important for current grade level work:
In Topic B students will build on their foundational understanding of the coordinate plane by learning that the ratio a:b is an ordered pair and can be plotted on a coordinate plane as (a, b) or (x, y). Students will discover that, when equivalent ratios from a table and/or double number line are plotted on the coordinate plane, they will form a straight line. Representing a ratio relationship on the coordinate plane gives students another mechanism by which they can check for equivalent ratios. Therefore, it is important that students have a strong foundation in how to create and plot points on the coordinate plane before beginning this topic of instruction.

Using the Diagnostic Assessment to identify gaps:

Problem 1:
Take note as to whether students make the connection between the x- and y- axes and their corresponding x- and y-coordinates. If students switch-up either of these, they may need further instruction on the fact that the x- and y- axes are separate number lines with corresponding x- and y-coordinates.

Problem 2:
Each ordered pair should have parentheses around it with a comma between the coordinates. Check to see if students are confusing the coordinates and their corresponding axes.

Problem 3:
Students should plot the points at the intersection of the lines, not in the open space. Students should label each point with its correct letter. Students may also label the point with the ordered pair.

Acceleration Resources for Targeted Instruction:

5th Grade, Module 6, Topic A, Lessons 2 - 4

Use the Concept Development portion of each Lesson and a sampling of problems from the Problem Set that focus on conceptual understanding.

Part B Focus: 5.G.A.2: Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Why this is important for current grade level work:
In Topic B students will learn to identify and explain the correspondences between equivalent ratios in a table and their position on the coordinate plane. They will see that as the pattern in the table increases, so does the line increase on the graph. In Lesson 13 students will use the value of a ratio to write equations from real-life situations and translate these equations into multiple equivalent ratios, graphing them on the coordinate plane. This will encourage students to reason abstractly and quantitatively about the relationship between equivalent ratios and their location on the coordinate plane. In grade 6 students will use the graphical representation of the coordinate plane to analyze data, predict values, and find missing values within a ratio. These problems will help identify student who can interpret points on the coordinate plane within a real-world context.

Using the Diagnostic Assessment to identify gaps:

Problem 4:
Look for students who confuse the meaning of the coordinates. Given that the axes are labeled, confusing the coordinates would show a lack of readiness for the target topic.

Problem 5:
Look for students who either use the wrong coordinates or put the coordinates in the incorrect order as both would be a sign that the student is not ready for the target topic.

Problem 6:
A student who misses this item can still be considered ready for the target topic but may need extra support while engaging with the new content of the topic.

Acceleration Resources for Targeted Instruction:

5th Grade, Module 6, Topic D, Lesson 20

Use the Concept Development portion of the Lesson and the Problem Set.

Part C Focus: 5.OA.B.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

Why this is important for current grade level work:
This standard begins the transition from recognizing the relationship within terms of the same sequence as an additive pattern to recognizing the relationship among corresponding terms from two sequences as a multiplicative relationship. Students begin to see that there is a continuing multiplicative relationship between two sequences of patterns. This begins the formal process of being able to recognize ratio relationships in context through reasoning with tables, tape diagrams, double number lines, equations, and coordinate grids. This standard is foundational for proportional reasoning.

Using the Diagnostic Assessment to identify gaps:

Problem 7:
The most important look for here is the accuracy of each pattern, ensuring students can follow a given rule to produce a pattern.

Problem 8:
Look for students who cannot identify a constant relationship between the two patterns, reporting an additive relationship that varies for each pair of corresponding terms. Such students may be considered ready for the target topic but will likely need additional support while engaging with the new content of the topic.

Problem 9:
Students may use either axis to represent Pattern 1 and still be considered ready for the target topic.

Acceleration Resources for Targeted Instruction:

5th Grade, Module 6, Topic B, Lesson 7

Use the Concept Development portion of the Lesson and the Problem Set.