

Eureka Remediation Tool: Grade 8

Module 4, 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 target remediation for students needing extra support before and **during** approaching on-grade-level work, creating opportunities for on-time remediation directly connected to the new learning.

About this Topic

Focus Standard:

8.EE.B.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

Topic Overview per the Eureka Curriculum

Topic B begins with students working with proportional relationships related to average speed and constant speed. In Lesson 10, students use information that is organized in the form of a table to write linear equations. In Lesson 11, students learn how to apply the concept of constant rate to a variety of contexts requiring two variables (**8.EE.B.5**). Lesson 12 introduces students to the standard form of an equation in two variables. At this point, students use a table to help them find and organize solutions to a linear equation in two variables. Students then use the information from the table to begin graphing solutions on a coordinate plane. In Lesson 13, students begin to question whether or not the graph of a linear equation is a line, as opposed to something that is curved. Lesson 14 presents students with equations in standard form, $ax + by = c$, where $a = 0$ or $b = 0$, which produces lines that are either vertical or horizontal.

Eureka Remediation Tool: Grade 8

Module 4, Topic B

Overview

Eureka Remediation 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. When appropriate, 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 Remediation

The Remediation 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. **Remediation 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 remediation ensures alignment to the standards, consistency in approach to learning, and similarities in strategies for solving problems.

Diagnostic Assessment: Grade 8 Eureka Module 4, Topic B

Part A: 7.RP.A.2a

1. Roger works as a math curriculum author. The table below shows the number of new math problems Roger creates for various amounts of time.

Number of New Math Problems	10	20	30	40	50
Number of Minutes	50	100	150	200	250

Is the relationship between the number of new math problems Roger creates and time proportional? Explain.

2. Vanessa owns a café that serves breakfast and lunch. She uses fresh produce in her recipes and wants to make sure she is pricing her menu items appropriately. Therefore, Vanessa researches the costs of various fruits and vegetables. The table below shows the cost for various amounts of apples.

Number of Apples	12	24	36	48	60
Cost (in dollars)	3	6	9	8	10

Is the relationship between the cost and quantity of apples proportional? Explain.

3. Brennaugh is saving money to purchase a new laptop for school. She begins saving with the money she receives for her birthday and continues by placing some additional money into her savings account each week. The table below shows her account balance over the course of several weeks.

Account Balance (in dollars)	100	120	140	160	180
Number of Weeks	1	2	3	4	5

Is Brennaugh's account balance proportional to the number of weeks she's been saving? Explain?

Diagnostic Assessment: Grade 8 Eureka Module 4, Topic B

Part B: 7.RP.A.2b

4. KKTY-Bayside, a local radio station, pays its disc jockeys (DJs) by the hour. The equation $w = 6.75h$ can be used to determine the total wages, w , payed to a DJ based on the number of hours, h , he/she works. Based on the equation, how much does KKTY-Bayside pay its DJs per hour worked? Show your work and/or explain your answer.
5. Good Eat Grocery sells chicken breasts by the pound. The table below shows a sampling of prices for various packages of chicken.

Weight (in pounds)	1.5	2	2.5	3	5
Cost (in dollars)	6	8	10	12	20

What is the price per pound of chicken at Good Eats Grocery? Show your work and/or explain your answer.

6. Kristof's enjoys making pancakes for his family on Saturday mornings. In order to have pancakes left over for the week, Kristof increases his recipe and uses $4\frac{1}{2}$ cups of flour and 9 tablespoons of sugar. How many cups of flour does Kristof use per tablespoon of sugar? Show your work and/or explain your answer.

Part C: 7.RP.A.2c

7. At basketball practice Coach Konkol makes his athletes do 50 burpees for every 5 missed shots. Create an equation that Coach Konkol can use to determine the number of burpees, b , an athlete must do based on the number of shots he misses, m .
8. Richard Gabrielle can run 3 miles in $19\frac{1}{2}$ minutes. Create an equation that Richard Gabrielle can use to determine the amount of time, t (measured in minutes), it would take him to run m miles at the same rate.

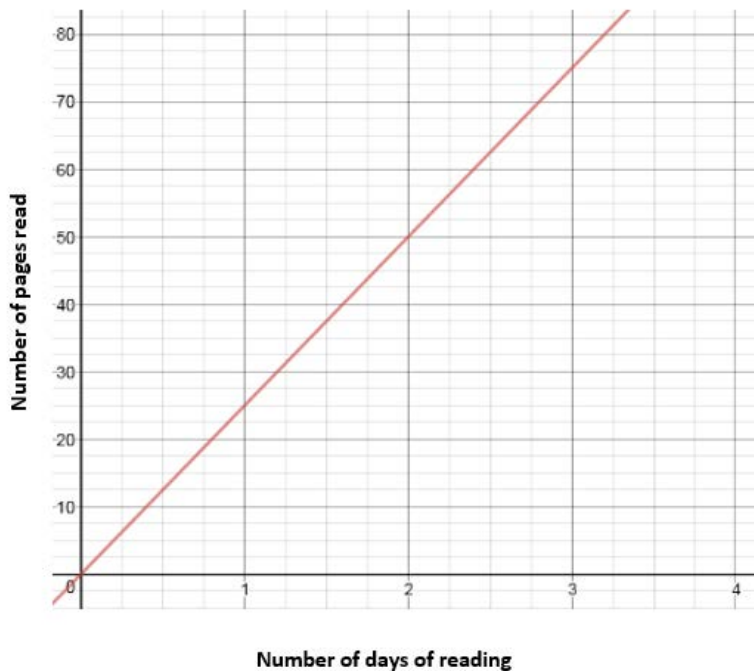
Diagnostic Assessment: Grade 8 Eureka Module 4, Topic B

9. Evangeline has been tasked with painting a mural on the side of a building in downtown Los Angeles. For the design she has created, Evangeline can paint 80 square feet in $1\frac{1}{4}$ hours. Create an equation that Evangeline can use to determine the amount of square feet, s , she could paint in t minutes at the same rate.

Part D: 7.RP.A.2d

Lilla Joy has recently fallen in love with reading. She reads every day during her free time at school and home. Her parents were so excited to see her newfound love of reading, they gave her a new book that was 275 pages in length and decided to chart the number of pages she read each day as a way of encouraging her to keep pushing through the long book. The graph below shows the number of pages Lilla Joy read over the course of four days. Use the graph to answer questions 10 – 12.

Lilla Joy's Reading Graph



10. Explain the meaning on the point (3, 75) within the context of the situation.
11. How many pages is Lilla Joy reading per day? Explain how you know.
12. Explain the meaning on the point (11, 275), not shown on the graph, within the context of the situation.

Diagnostic Assessment Key: Grade 8 Eureka Module 4, Topic B

Solutions:

1. (Sample) Yes, the table shows equivalent ratios of 1 new problem every 5 minutes.
2. (Sample) No, the price per apple is not the same when buying 36 apples and 48 apples.
3. (Sample) No, a graph of the relationship does not pass through the origin.
4. \$6.75; explanations will vary.
5. \$4; explanations will vary.
6. $\frac{1}{2}$; explanations will vary.
7. $b = 10m$
8. $t = 6.5m$
9. $s = 64t$
10. (Sample) The point means that Lilla Joy read 75 pages in 3 days.
11. (Sample) Lilla Joy is reading at a rate of 25 pages per day. This can be seen in the point (1, 25).
12. (Sample) It will take Lilla Joy eleven days to finish the book.

Remediation Guidance: Grade 8 Eureka Module 4, Topic B

Part A Focus: 7.RP.A.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

<p>Why this is important for current grade level work: Topic B centers on proportional relationships, expecting students to have a solid understanding of and the ability to quickly recognize a proportional relationship. Therefore, it is critical that students have a solid understanding of proportional relationships prior to engaging with the target Topic. The problem set allows for students to justify their choice by any means with which they feel comfortable, so the key look-fors here are the accuracy of their choice and the quality of their explanation. Also, look for students who justify each problem the same way (i.e., they use a graph on all three problems). While this is not necessarily problematic, it might be an indication of a limited understanding of proportional relationships and the multiple representations used when studying proportional relationships.</p>	
<p>Using the Diagnostic Assessment to identify gaps:</p>	
<p>Problem 1: Look for students who correctly identify the relationship as proportional but justify by means of an adding pattern in the table (i.e., add 10 across the top and add 50 across the bottom). This might signify a gap in understanding that proportional relationships are multiplicative in nature, not additive.</p>	<p>Problem 2: Look for students who only check the first three entries in the table and conclude that the relationship is proportional, not realizing that the price per apple changes with the fourth entry.</p>
<p>Problem 3: Look for students who think the additive nature of the data constitutes a proportional relationship, not realizing that the graph would not pass through the origin due to the initial value of \$100.</p>	<p>Remediation Resources for Targeted Instruction: <u>7th Grade, Module 1, Topic A, Lesson(s) 2 – 5</u> Use the Classwork portion of each of the Lessons and a sampling of problems from the Problem Set focused on conceptual understanding.</p>

Remediation Guidance: Grade 4 Eureka Module 4, Topic B

Part B Focus: 7.RP.A.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Why this is important for current grade level work:

Topic B serves as the bridge to one of the most important ideas of Grade 8, linear equations in two variables. Utilizing proportional relationships to introduce linearity, the Topic places a heavy emphasis on the constant of proportionality (unit rate). As students progress through Module 4, the idea of the constant of proportionality will be extended to the idea of slope; thus, a firm understanding of constant of proportionality is essential to mastering several Grade 8 standards. The problems set scaffolds by allowing students to engage first with an equation, then a table, and finally a verbal description, leaving graphs to be assessed in Part D. While being able to identify the constant of proportionality from an equation and a table are important, doing so from a verbal description is the most important.

Using the Diagnostic Assessment to identify gaps:

Problem 4:

Look for students who do not recognize the constant of proportionality in the equation and/or do not connect unit rate to the constant of proportionality. Such students will likely leave the item blank or try to work for the answer, possibly plugging numbers into the equation.

Problem 5:

Look for students who perform their calculations in the reverse order, leading them to think the answer is $\frac{1}{4}$ instead of 4. Encourage such students to interpret their answer within the context of the problem and determine if it is reasonable.

Problem 6:

Look for a student who says the answer is $4\frac{1}{9}$, not knowing how to calculate the quotient of $4\frac{1}{2}$ and 9 as this points to a gap in mastery of 6.NS.A.1.

Remediation Resources for Targeted Instruction:

7th Grade, Module 1, Topic B, Lesson 7

Use the Classwork portion of the Lesson and a sampling of problems from the Problem Set focused on conceptual understanding.

Remediation Guidance: Grade 4 Eureka Module 4, Topic B

Part C Focus: 7.RP.A.2c: Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.*

Why this is important for current grade level work:

Beginning in the first lesson of the target Topic, Lesson 10, and continuing throughout the remainder of the Topic, students are expected to be able to represent relationships, beginning with proportional relationships and extending to other linear relationships, with equations. Early in the Topic, students will utilize a table to help identify a constant rate prior to creating an equation, but later in the Topic students are expected to be able to move from a verbal description of a relationship involving a constant rate to an equation that models the given situation. The problems here are somewhat analogous to what students will see in Lessons 10 and 11; therefore, this should not be viewed as a strict prerequisite. Rather, students who show gaps in understanding may just need additional supports while engaging with the target Topic.

Using the Diagnostic Assessment to identify gaps:

Problems 7 – 9:

Look for students who reverse the relationship when modeling the situation with an equation as each problem has an implied input and output. While there are two equivalent equations that could be used to model each situation, the interpretation and use of each equation varies greatly. For example, if a student creates the equation $m = \frac{b}{10}$ on problem 7, this models the number of missed shots based on the number of burpees, the reverse of what the question asked for.

Additionally, look for students who create an appropriate equation but lack the arithmetic skills to calculate the constant of proportionality. For example, look for a student who creates the equation $s = \frac{80}{1\frac{1}{4}}t$, not knowing how to calculate the quotient of 80 and $1\frac{1}{4}$ as this points to a gap in mastery of 6.NS.A.1.

Remediation Resources for Targeted Instruction:

7th Grade, Module 1, Topic B, Lesson(s) 8 – 9

Use the Classwork portion of each of the Lessons and a sampling of problems from the Problem Set focused on conceptual understanding.

Remediation Guidance: Grade 4 Eureka Module 4, Topic B

Part D Focus: 7.RP.A.2d: Explain what a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.

Why this is important for current grade level work:

In Lesson 11 students move from an equation, to a table, to a graph, all representing the same proportional relationship. From the graph students are then directed back to the proportional relationship to solve a particular problem involving various constant rates. The expectation is that students can easily answer the questions using the graph, not relying only on their algebra skills to use the equation to answer the question. While the skill of plotting points is important, without the ability to interpret points inside the context of the problem, students will struggle to engage with the new learning of the target Topic. Furthermore, Lesson 12 extends the work with proportional relationships to non-proportional, linear relationships, still requiring and leveraging students' ability to interpret ordered pairs in the context of a real-world situation.

Using the Diagnostic Assessment to identify gaps:

Problem 10:

Look for students who fail to connect the ordered pair to the context, simply stating how to plot the point or referring to the x- and y-axes. This shows a gap in understanding the connection between multiple representations of a proportional relationship.

Problem 11:

Look for students who rely on calculations to get the unit rate as this shows a misunderstanding of how to use the graph to answer such questions.

Problem 12:

Look for students who struggle to interpret the ordered pair since it's not actually shown on the graph. Encourage such students to lean on their understanding used in problem 10.

Remediation Resources for Targeted Instruction:

[7th Grade, Module 1, Topic B, Lesson 10](#)

Use the Classwork portion of the Lesson and a sampling of problems from the Problem Set focused on conceptual understanding.