

Eureka Remediation Tool: Grade 7

Module 2, Topic C

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 Standards:

7.EE.A.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, $a + 0.05a = 1.05a$, means that “increase by 5%” is the same as “multiply by 1.05”.*

7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about quantities.

- a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*

Topic Overview per the Eureka Curriculum

Students use algebra and rational numbers in Topic C to problem-solve, building upon their foundational work with rational numbers and expressions and equations in Grade 6 (6.NS.C.5, 6.EE.A.2, 6.EE.A.3, 6.EE.A.4, 6.EE.B.5, 6.EE.B.6, 6.EE.B.7). Topic C begins in Lesson 17 with students finding solutions to word problems by working backward and using tape diagrams to model the algebraic steps they use to arrive at the solution. In Lessons 18 and 19, students create and evaluate equivalent forms of expressions involving rational numbers to see structure, reveal characteristics, and make connections to context (7.EE.A.2). Lesson 20 is a modeling lesson in which students are presented with a scenario related to an investment account’s activity over the course of several years. Students interpret the information and develop a strategy to find the actual changes to the account balance each year. In Lesson 21, students return to the Integer Game that they played in earlier lessons to better understand *if-then* statements. They relate making the same changes to two equal card-hand totals to making equivalent changes to each side of a true number sentence. Therefore, they show, for instance: *If $a = b$, then $a - c = b - c$.* Topic C concludes with a two-day lesson. In Lessons 22 and 23, students work toward fluently solving word problems through the use of equations (7.EE.B.4a). Using algebra to deconstruct and solve contextual problems continues as the focus in Module 3.

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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 7 Eureka Module 2, Topic C

Part A: 4.OA.A.3

1. Jadarius has three times as many baseball cards in his collection than his brother, Chase, has in his collection. For his birthday Jadarius plans to get 50 new baseball cards.
 - a. If Chase has 200 baseball cards in his collection, how many cards will Jadarius have after his birthday? Show your work and/or explain your thinking.

 - b. Represent the problem with an equation using c to stand for the unknown number of cards.

2. Nate and Ryder want to combine their money to buy their mother a birthday present. Nate has saved \$75, and Ryder has saved double the amount that Nate has saved.
 - a. If the present they want to buy their mother costs \$250, how much more money do they need? Show your work and/or explain your thinking.

 - b. Represent the problem with an equation using m to stand for the unknown amount of money.

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3. Brennaugh wants to thank everyone who attends her party by giving them a goody bag. She buys a bag of assorted candy that contains 75 pieces of candy. Brennaugh removes 25 pieces of candy to save for herself before making the goody bags.
 - a. If Brennaugh plans to put four pieces of candy in each goody bag, how many friends should she invite to her party? Show your work and/or explain your thinking.

 - b. Represent the problem with an equation using p to stand for the unknown number of pieces of candy in each goody bag.

Part B: 6.EE.B.6

4. Kenje's Book Store is selling textbooks for $\frac{1}{2}$ off the original price. Write an expression that represents the amount of money, in dollars, saved on a textbook that had a regular price of d dollars.

5. Erick is purchasing new drumsticks for the marching band at his alma mater. Each set of new drumsticks costs \$8.50. Write an expression that represents the amount of money, in dollars, that Erick will need to purchase s sets of drumsticks.

6. Malakai took 3 friends to the movies. She brought with her \$35. Each movie ticket costs t dollars. Write an expression that represents the amount of money, in dollars, that Malakai had after purchasing the tickets.

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Part C: 6.EE.B.7

7. Misty spent \$480 evenly on her three children. Write and solve an equation to determine how much money, m , in dollars, Misty spent on one of her children.
8. Maggie is writing math problems for a new textbook. She averages 12 new problems per hour. Write and solve an equation to determine the number of hours, h , that Maggie must work to write a total of 435 new math problems.
9. Kyle is driving across the country on a road trip. He wants to use less than 4 tanks of gas on his trip. He can drive about 500 miles on a single tank of gas, g . Write and solve an equation to determine if Kyle's plan is possible given the total trip is 1,875 miles.

Diagnostic Assessment Key: Grade 7 Eureka Module 2, Topic C

Solutions:

- a. 650

b. (sample) $200 \times 3 + 50 = c$
- a. \$25

b. (sample) $75 + 2(75) + m = 250$
- a. 12

b. (sample) $p = (75 - 25) \div 4$
- (sample) $d \div 2$
- (sample) $8.5 \times s$
- (sample) $35 - 4t$
- (sample) $3m = 480$; $m = 160$ which means Misty spent \$160 on one child.
- (sample) $12h = 435$; $h = 36.25$ which means it will take Maggie 36 hours and 15 minutes to create 435 new math problems.
- (sample) $500g = 1,875$; $g = 3.75$ which means Kyle will need less than 4 tanks of gas for the trip.

Remediation Guidance: Grade 7 Eureka Module 2, Topic C

Part A Focus: 4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. *Example: Twenty-five people are going to the movies. Four people fit in each car. How many cars are needed to get all 25 people to the theater at the same time?*

<p>Why this is important for current grade level work: Topic C focuses on students combining their new understandings and skills around arithmetic with all rational numbers with their algebra skills to solve multi-step, real-world problems. Students first solved multi-step, real-world problems in Grade 4 after becoming proficient with all four operations on whole numbers. These problems scaffold in difficulty and should help teachers identify which students are equipped to model real-world situations with appropriate mathematics. Additionally, students will be expected to create expressions and equations using a variable to represent an unknown quantity. While this understanding began in Grade 3, this foundational standard also included such work. While correctly answering each question is important, modeling each real-world situation is the most important look-for in this section.</p>			<p>Remediation Resources for Targeted Instruction:</p> <p><u>4th Grade, Module 3, Topic D, Lesson(s) 12 – 13</u> OR <u>Module 3, Topic G, Lesson(s) 31 – 32</u></p> <p>Use the Concept Development portion of each Lesson and a sampling of problems from the Problem Set focused on application.</p> <p>Note: If Problem 3 is missed, utilize Lessons 31 – 32.</p>		
<p>Using the Diagnostic Assessment to identify gaps:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>Problem 1: Look for students who add 3 to the number of cards in Chase’s collection as this shows an inability to distinguish multiplicative comparison from additive comparison. Also, look for student who add the 50 cards to Chase’s total before finding three times as many. Such students may have a misunderstanding of Order of Operations, thinking you must add before you can multiply.</p> </td> <td style="width: 33%; vertical-align: top;"> <p>Problem 2: Look for students who write in their equation $75 + 75 + 75$ instead of using any multiplication. Such students should be considered ready for the target Topic but may need additional support solving problems involving multiplication.</p> </td> <td style="width: 33%; vertical-align: top;"> <p>Problem 3: Look for students who subtract first in their calculation but fail to correctly build their equation, likely leaving out the parenthesis around the difference. Such students should be considered ready for the target Topic but may need additional support creating expressions/equations to represent multi-step problems.</p> </td> </tr> </table>					<p>Problem 1: Look for students who add 3 to the number of cards in Chase’s collection as this shows an inability to distinguish multiplicative comparison from additive comparison. Also, look for student who add the 50 cards to Chase’s total before finding three times as many. Such students may have a misunderstanding of Order of Operations, thinking you must add before you can multiply.</p>
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Part B Focus: 6.EE.B.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

Why this is important for current grade level work: Similar to the expectation in Part A, students should be able to model a real-world situation with mathematics, either with an expression or an equation. This foundational standard focuses on creating expressions that arise when the total is not given, setting students up for creating and solving equations that model real-world problems. Beyond giving students a simple list of key words, students need a deep understanding of modeling and the ability to create appropriate models. The most important look-for here is students' ability to use the correct operation.			Remediation Resources for Targeted Instruction: <u>6th Grade, Module 4, Topic F, Lesson(s) 18 – 20</u> Use the Classwork portion of each Lesson and a sampling of problems from the Problem Set focused on writing expressions.
Using the Diagnostic Assessment to identify gaps:			
Problem 4: Students may create an expression using a fraction for division or multiplication by a fraction and be considered ready for the target Topic.	Problem 5: Look for students who use either addition or division in their expression as this shows a lack of understanding of a multiplicative relationship.	Problem 6: Look for students who neglect to take into account Malakai's ticket, creating an expression with 3 as the coefficient instead of 4. If this is the only mistake, such students should be considered ready for the target Topic but will likely need additional supports while engaging with the new learning.	

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Part C Focus: 6.EE.B.7: Solve real-world and mathematical problems by writing and solving equations and inequalities of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers. Inequalities will include $<$, $>$, \leq , and \geq .

<p>Why this is important for current grade level work: This foundational standard puts together the work in the previous two foundational standards: solving word problems and modeling real-world situations. As the problems become increasingly more complex, it is not enough for a student to simply be able to work backwards or think through the problem to the answer. Modeling is an essential skill for middle school and especially for high school, serving as its own conceptual category. As such, the most important look-fors here is the accuracy of the equation built to model the real-world problem and the interpretation of the answer to the model within the context of the real-world problem. Having the algebraic skills to solve an equation are not enough when it comes to modeling. Students must be able to use their model to answer a larger question inside the context of the problem.</p>			<p>Remediation Resources for Targeted Instruction: <u>6th Grade, Module 4, Topic G, Lesson(s) 26 – 29</u> Use the Classwork portion of each Lesson and a sampling of problems from the Problem Set focused on application.</p>	
<p>Using the Diagnostic Assessment to identify gaps:</p>				
<p>Problem 7: Look for students who create the equation $\frac{480}{3} = m$, recognizing the need for division as fair sharing. Such a response should be considered correct and a sign of readiness for the new learning.</p>	<p>Problem 8: Look for student who struggle to appropriately deal with the non-whole number answer. Both a decimal or fraction are acceptable, but students may not understand what each represents within the context of time. Such a student should be considered ready for the new learning but may need additional supports when working with problems involving time.</p>	<p>Problem 9: Look for students who cannot connect their model to the actual problem. Correctly solving the equation without answering the question is not sufficient and likely serves as a sign of a student who has a gap in modeling. Push the student to think about the larger question, not just the algebra.</p>		