## Eureka Remediation Tool: Grade 7 Module 1, Topic C

To become mathematically proficient, students must access on-gradelevel 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.RP.A.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks $1 / 2$ mile in each $1 / 4$ hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.
7.RP.A.3: Use proportional relationships to solve multi-step ratio and percent problems of simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error.

## Topic Overview per the Eureka Curriculum

In the first two lessons of Topic C , students' knowledge of unit rates for ratios and rates is extended by considering applications involving fractions, such as a speed of $1 / 2$ mile per $1 / 4$ hour. Students continue to use the structure of ratio tables to reason through and validate their computations of rate. In Lesson 13, students continue to work with ratios involving fractions as they solve problems where a ratio of two parts is given along with a desired total quantity. Students can choose a representation that most suits the problem and their comfort levels, such as tape diagrams, ratio tables, or possibly equations and graphs, as they solve these problems, reinforcing their work with rational numbers. In Lesson 14, students solve multi-step ratio problems, which include fractional markdowns, markups, commissions, and fees. In the final lesson of the topic, students focus their attention on using equations and graphs to represent proportional relationships involving fractions, reinforcing the process of interpreting the meaning of points on a graph in terms of the situation or context of the problem.

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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 1, Topic C 

## Part A: 4.NF.A. 1

1. Is $\frac{3}{4}$ equivalent to $\frac{7}{8}$ ? Use visual fraction models to explain your answer.
2. Is $\frac{6}{12}$ equivalent to $\frac{2}{4}$ ? Use visual fraction models to explain your answer.
3. Is $\frac{40}{60}$ equivalent to $\frac{2}{3}$ ? Explain your answer.

Part B: 5.NF.B. 3
4. Write a division sentence that is equivalent to $\frac{17}{11}$.
5. Brielle mixed oats, wheat, and hops together to make horse feed for six horses. She forgot to add a bag of vitamin mix that weighed 8 pounds. How many pounds of vitamin mix should she put in each horse's feed pale? Show your work and explain your answer.
6. Misty and her four friends ordered two large pizzas to share for lunch. If each large pizza has eight slices, how many slices of pizza will each person get for lunch? Show your work and explain your answer.

# Diagnostic Assessment: Grade 7 Eureka Module 1, Topic C 

Part C: 6.NS.A. 1
7. Compute the quotient using a visual fraction model to support your answer.
$4 \frac{2}{3} \div \frac{1}{3}$
8. Compute the quotient.
$\frac{7}{8} \div \frac{5}{6}$
9. Kyle wanted to cook hamburgers for he, his wife, and their three children. He went to the store and purchased $2 \frac{1}{4}$ pounds of lean ground beef. Kyle noticed that his kids can typically eat a full quarter-pound burger with ease, and a quarter-pound burger is not enough to fill he and his wife. So, he wants to make each burger approximately $\frac{2}{5}$ of a pound. How many burgers can Kyle make? Will he have any meat left over? Show your work and explain your answer.

# Diagnostic Assessment Key: Grade 7 Eureka Module 1, Topic C 

Solutions:

1. No. Models will vary but must show equal wholes.
2. Yes. Models will vary but must show equal wholes.
3. (Sample) Yes, 4 tens is two equal groups of 2 tens, and 60 can be thought of as three equal groups of 2 tens. This means that 40 is two thirds of 60 .
4. $17 \div 11$
5. $1 \frac{1}{3}$
6. $3 \frac{1}{5}$
7. 14
8. $\frac{42}{40}$ or $\frac{21}{20}$
9. (Sample) Kyle can make five burgers with some ground beef left over.

## Remediation Guidance: Grade 7 <br> Eureka Module 1, Topic C

Part A Focus: 4.NF.A.1. Explain why a fraction $a / b$ is equivalent to a fraction $(n \times a) /(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. (Denominators are limited to $2,3,4,5,6,8,10,12$, and 100.)

## Why this is important for current grade level work:

The target Topic focusses extending the concepts of ratios, rates, and unit rates beyond whole number quantities to include fractions of quantities. Beginning in Lesson 11, the lessons assume students have a solid understanding of fractions and are fluent in creating equivalent fractions as well as dividing fractions. While the lessons provide some optional scaffolding the reinforce fractions, this item set will help you determine which students have a deep understanding of fraction equivalence. Note that the first two problems require the use of a visual fraction model, while the third problem does not. Visual models are used throughout the learning of the RP standards, including throughout the target Topic, and these items will determine which students can use visual models appropriately to support their understanding. Students who are unable to use visual models will struggle to engage with the target Topic. The most important look-fors here are the accuracy of their response and visual fraction models. Using the Diagnostic Assessment to identify gaps:

## Problems 1-2:

These problems are not designed to assess students' ability to compare fractions; rather, these problems are designed to assess whether students can create visual fraction models and use them to determine if two fractions are equal. As such, look for students who draw different sized models as this is a clear indicator the student is not ready for the grade-level work.

## Problem 3:

Look for students who support their answer through a procedure that lacks understanding (i.e., I took off the zeros) as the lack of understanding will likely hinder such students from engaging with the target Topic. Encourage students to reason using place value and/or properties of operations.

Remediation Resources for Targeted Instruction:

4th Grade, Module 5, Topic B, Lesson(s) 7-11

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

## Remediation Guidance: Grade 7 <br> Eureka Module 1, Topic C

Part B Focus: 5.NF.B.3. Interpret a fraction as division of the numerator by the denominator $(a / b=a \div b)$. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret $3 / 4$ as the result of dividing 3 by 4 , noting that $3 / 4$ multiplied by 4 equals 3 , and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?

## Why this is important for current grade level work:

Similar to Part A, the target Topic is built on an assumption that students understand fractions as division and can solve word problems involving division. In this Topic students will have their first experience with complex fractions. Having a solid understanding of fractions as division will allow students to focus more on the new learning of the target Topic, allowing them to easily move from ratios to rates to unit rates. Furthermore, the entire Topic is grounded in real-world context, helping students make meaning of the math while also challenging them to see its real-world application. Students who are proficient in solving real-world problems involving division of whole numbers will have an advantage will engaging with the target Topic, specifically in the myriad of problems that require division of whole numbers and/or fractions.

## Using the Diagnostic Assessment to identify gaps:

## Problem 4:

Look for students who think the appropriate division sentence is $11 \div 17$, extending from a misconception that the dividend must be larger than the divisor. Such a misconception will cause students to struggle as they engage with the target Topic.

## Problem 5:

Look for students who think the answer is $\frac{8}{6}$ or $\frac{4}{3}$ and push such students to think about their answer in terms of the context of the problem. While the answers are not incorrect, using the mixed number equivalent makes more sense in the context of the problem. Students with this understanding will have an advantage while engaging with the target Topic.

## Problem 6:

Look for students who think the answer is 3 , instead of $3 \frac{1}{5}$, presuming that there cannot be a fraction of a slice of pizza. While knowing each friend will receive 3 slices shows considerable understanding, students need to understand that fractional amounts are acceptable.

## Remediation Resources for Targeted Instruction:

5th Grade, Module 4, Topic B, Lesson(s) 2 - 5

Use the Concept Development portion of each Lesson and a sampling of problems from the Problem Set focused on conceptual understanding and/or application, depending upon the diagnosed gaps.

## Remediation Guidance: Grade 7 <br> Eureka Module 1, Topic C

Part C Focus: 6.NS.A.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2 / 3) \div(3 / 4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2 / 3) \div(3 / 4)=8 / 9$ because $3 / 4$ of $8 / 9$ is $2 / 3$. (In general, $(a / b) \div(c / d)=a d / b c$.) How much chocolate will each person get if 3 people share $1 / 2 \mathrm{lb}$ of chocolate equally? How many $3 / 4$ - cup servings are in $2 / 3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3 / 4$ mi and area $1 / 2$ square mi?

## Why this is important for current grade level work:

Extending directly from Part B, these items assess students understanding of and ability to divide fractions, as well as, solve real-world problems involving division of fractions. Mastery of these understandings and skills will make the target Topic very accessible, especially for those students who did well in Topics A and B, as the target Topic simply combines the knowledge and skills of 6.NS.A. 1 with the language of ratios,
rates, and unit rates. If students have significant gaps here, it will all but lock them out of the target Topic, as they will have to spend too much time and thought power on the arithmetic and/or recognizing situations involving division.

## Using the Diagnostic Assessment to identify gaps:

## Problem 7:

Look for students who are unable to produce a useable visual fraction model as students should recognize that $4 \frac{2}{3}$ can easily be divided into thirds, not requiring any algorithm to calculate the quotient. Being able to calculate the quotient procedurally without having an understanding of the mathematics will hinder students from engaging with the target Topic.

## Problem 8:

While having a solid understanding of division of fractions is crucial, being fluent in dividing fractions is also important. Look for students who are dependent upon a visual fraction model as this will not be efficient on many problems throughout the target Topic. Push such students to a more efficient strategy.

## Problem 9:

Look for students who are unable to determine that division is the most efficient method for solving the problem. While a student may use repeated subtraction to answer the problem, being able to use division to solve such problems will allow students to more easily engage with the target Topic. Also, while the item does not explicitly ask students to interpret the remainder, the item does provide an opportunity for a rich discussion around interpreting the remainder in the context of the problem.

## Remediation Resources for Targeted Instruction:

6th Grade, Module 2, Topic A, Lesson(s) 3-5

Use the Classwork portion of each Lesson and a sampling of problems from the Problem Set focused on conceptual understanding and/or application, depending upon the diagnosed gaps.

