Eureka Remediation Tool: Grade 7
Module 4, Topic A

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.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.2: Recognize and represent proportional relationships between quantities.

c. 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* $t = pn$.

7.RP.A.3: Use proportional relationships to solve multistep 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 Topic A, students build on their conceptual understanding of percent from Grade 6. They realize that a percent can be greater than 100% or less than 1%. They also realize that a percent can be a non-whole number such as $33\frac{1}{3}\%$, part of a complex fraction such as $\frac{33\frac{1}{3}}{100}$, or a simplified but equivalent fraction such as $\frac{1}{3}$. They know 100% to be the whole and also equal to one. They use this conceptualization along with their previous understanding of ratios and proportional relationships from Module 1 to solve percent problems (**7.RP.A.2c**, **7.RP.A.3**). In Lesson 1, students revisit the meaning of the word *percent* and convert between fractions, decimals, and percents with a Sprint at the beginning of the lesson. As the lesson progresses, students use complex fractions to represent non-whole number percents; they also recognize that any percent greater than 100% is a number greater than one, and any percent less than 1% is a number less than one-hundredth. Students realize that, for instance, 350% means 350 for every 100, which equals 3.5, or $3\frac{1}{2}$, for every 1 (**7.RP.A.1**). In Lessons 2 and 3, students deepen their conceptual understanding of percent and the relationship between the part and the whole. They use a variety of models, including fractional representations, visual models (i.e., 10 by 10 grids and double number line diagrams), and algebraic models. As an algebraic representation, they use the formula $\text{Part} = \text{Percent} \times \text{Whole}$ to solve percent problems when given two terms out of three from the part, percent, and whole. Students continue to use this algebraic representation in Lesson 3 and write $\text{Quantity} = \text{Percent} \times \text{Whole}$ in situations where the part is larger than the whole. For instance, when expressing 250 as a percent of 200, they identify 200 as the whole, write $250 = p \cdot 200$, and solve the equation to reach a value of $p = 1.25$, which equals 125%. They relate their solution to a visual model, such as a double number line diagram, where 200 represents 100%, so 250 would represent 125%. Lesson 3 includes a percent Sprint, where students use mental math, patterns, place value, and the meaning of percent as *per hundred* to find specified percents of quantities such as 15% of 20, 30% of 20, etc.

Students advance their work with percents in Lesson 4 when they solve problems related to percent increase and decrease (**7.RP.A.3**). They continue to use algebraic representations and identify the whole in the context of the situation. In Lesson 5, students find one hundred percent when given another percent. They recognize that they can always find 1% of a quantity (by dividing it by 100 or multiplying it by $\frac{1}{100}$) and use 1% to find quantities represented by other percents. Students understand that an algebraic equation may not always be the most efficient way to solve a percent problem. They recognize factors of 100 and use mental math, proportional reasoning, and double number line diagrams to problem-solve as well. Topic A culminates with Lesson 6, where students solve various percent problems using the different strategies and complete a Sprint as they work toward fluency in finding the part, whole, and percent.

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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.

Part A: 6.RP.A.3c

1. Oscar scored a 45/50 on his most recent test. What percent of the problems did Oscar get correct? Show your work and/or explain your answer.

2. Serenity picked 75% of the apples of a tree in her backyard. If she picked 30 apples, how many apples were on the tree to begin with? Show your work and/or explain your answer.

3. Tripp decided to go on vacation to the beach. After driving 60% of the way, he decided to stop for lunch. If he stopped for lunch after 240 miles of driving, how many total miles will he have to drive? Show your work and/or explain your answer.

Solutions:

1. 90 (%)
2. 40 (apples)
3. 400 (miles)

Remediation Guidance: Grade 7
Eureka Module 4, Topic A

Part A Focus: 6.RP.A.3c: Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30 /100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Why this is important for current grade level work:

In Topic A, students will strengthen their conceptual understanding and build fluency with finding percent of a quantity as a rate per 100 by using mental math, tables of equivalent ratios, tape diagrams, and double number lines. This work will prepare students to solve percent increase and decrease problems as well as begin work with percentages greater than 100% and less than 1%. Students will discover new strategies such as finding 1% of a quantity and using that to find any other percent of that quantity. A deep conceptual understanding of percent as a rate per 100 is necessary for students to be able to assimilate new knowledge in Grade 7, Module 4. The problems scaffold in difficulty with problem 1 assessing students' understanding of a percent as a rate per 100 while problems 2 and 3 assess solving problems involving percents.

Using the Diagnostic Assessment to identify gaps:

Problem 1:

Look for students who use division to calculate the percent, not recognizing that creating an equivalent fraction with a denominator of 100 would be the most efficient way to solve the problem. This likely shows a gap in understanding what a percent is and, instead, a memorization of a process of conversion. Such a lack of understanding will limit students' ability to engage with the new learning of the target Topic.

Problem 2:

Look for students who try to find 75% of 30, not recognizing that 30 is 75% of some unknown whole. Students should recognize that 30 is 3 equal parts of 4 total parts, making the arithmetic fairly simple and accessible.

Problem 3:

Similar to problem 2, look for students who find 60% of 240, not recognizing that 240 is 60% of some unknown whole. Students should recognize 240 as 6 equal parts of 10 total parts, making the arithmetic fairly simple and accessible.

Remediation Resources for Targeted Instruction:

6th Grade, Module 1, Topic D, Lesson(s) 24 – 29

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