Eureka Remediation Tool: Grade 7
Module 3, 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.EE.A.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients to include multiple grouping symbols (e.g., parentheses, brackets, and braces).

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*".*

Topic Overview per the Eureka Curriculum

In Lesson 1 of Topic A, students write equivalent expressions by finding sums and differences extending the *any order* (commutative property) and *any grouping* (associative property) to collect like terms and rewrite algebraic expressions in standard form (**7.EE.A.1**). In Lesson 2, students rewrite products in standard form by applying the commutative property to rearrange like items (numeric coefficients, like variables) next to each other and rewrite division as multiplying by the multiplicative inverse. Lessons 3 and 4 have students using a rectangular array and the distributive property as they first multiply one term by a sum of two or more terms to expand a product to a sum, and then reverse the process to rewrite the sum as a product of the GCF and a remaining factor. Students model real-world problems with expressions and see how writing in one form versus another helps them to understand how the quantities are related (**7.EE.A.2**). In Lesson 5, students recognize that detecting inverses and the identity properties of 0 for addition and 1 for multiplication allows for ease in rewriting equivalent expressions. This topic culminates with Lesson 6 with students applying repeated use of the distributive property as they collect like terms containing fractional coefficients to rewrite rational number expressions.

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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
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Part A: 6.EE.A.3

1. Apply properties of operations to write an equivalent expression.
   $t + t + t + t$

2. Apply the distributive property to write an equivalent expression.
   $4(2 + w)$

3. Apply the distributive property to write an equivalent expression.
   $21b + 28c$

Part B: 6.EE.A.4

4. Are these two expressions equivalent? Explain how you know.
   $r + r + r$ and $3r$

5. Are these two expressions equivalent? Explain how you know.
   $4(m + n)$ and $4m + n$

6. Are these two expressions equivalent? Explain how you know.
   $2(x + y + z)$ and $2x + 2(y + z)$

Solutions:

1. $4t$
2. $8 + w$
3. $7(3b + 4c)$
4. (Sample) Yes, three of the same value added together is equivalent to that value times three. For example, 4 + 4 + 4 = 3(4) = 12.
5. (Sample) No, the first expression has a total of four *n*'s while the second expression only has a single *n*. For example, $4(m + n) = (m + n) + (m + n) + (m + n) + (m + n) = 4m + 4n.$
6. (Sample) Yes, each expression has a total of 2 *x*'s, *y*'s, and *z*'s.

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Part A Focus: 6.EE.A.3: Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*

Why this is important for current grade level work:
Students' work with algebraic expressions began in Grade 6 and will now, in the target Topic and Module, be more formalized with a focus on linear expressions. While it is important for students to have a base understanding of equivalent expressions in addition to some skill in generating equivalent expressions, the skills for generating equivalent expressions will be revisited in the target Topic beginning in Lesson 1 and extending through Lesson 6. The most important look-for here is that students produce an expression that is equivalent to the given expression, even if it's not the most simplified equivalent expression. Those skills and understandings will come in the target Topic.

Using the Diagnostic Assessment to identify gaps:

Problem 1:
A student may write an expression such as $2t + 2t$ and still be considered ready for the target standard. Look for students who change the exponent when adding as this shows a fundamental misunderstanding of addition that likely extends back beyond algebraic expressions.

Problem 2:
A student may write an expression such as $4(2) + 4(w)$ and still be considered ready for the target standard. Look for students who only distribute to the first term and suggest using expansion to see the entire expression should be written four times, not just the first term in the expression.

Problem 3:
Look for students who struggle to engage with the directions, not seeing factoring as an application of the distributive property. Question such students to distinguish which are struggling with the academic vocabulary compared to those who cannot apply the distributive property to factor an expression.

Remediation Resources for Targeted Instruction:

6th Grade, Module 4, Topic D, Lesson(s) 9 – 12

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

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Part B Focus: 6.EE.A.4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*

<table>
<tr><td colspan="2">Why this is important for current grade level work:
The target topic spends the first two lessons extending properties of operations to generating equivalent expressions. With simple numeric expressions, students can easily decide if two expressions are equivalent based solely on arithmetic facts. For example, 2 + 3 and 5 are equivalent because 2 + 3 has a value of 5; however, it is not as easy to determine if algebraic expressions are equivalent. For example, 2a + 3 and 5 are equivalent only when a = 1, otherwise they are not equivalent. While the first two lessons of the topic will continue to build understanding of equivalent expressions, students will greatly benefit by having a base understanding of equivalent expressions prior to engaging with Lesson 5.</td><td rowspan="3">Remediation Resources for Targeted Instruction:

6th Grade, Module 4, Topic C, Lesson(s) 8

Use the Concept Development portion of the Lesson and a sampling of problems from the Problem Set that focus on conceptual understanding.</td></tr>
<tr><td colspan="2">Using the Diagnostic Assessment to identify gaps:</td></tr>
<tr><td>Problem 4:
Look for students justify their choices algebraically or by simply showing a single example where the two expressions are equivalent. Push such students to think more deeply about the problem, ensuring they can truly justify their selection of equivalent or not.</td><td>Problems 5 – 6:
Look for students who are unable to accurately apply (or recognize the application of) the distributive property. While Lesson 6 will continue to develop understanding of the distributive property, the lesson does assume that students have some fundamental understanding of the property prior to engaging with the lesson.</td></tr>
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