College and Career Ready Standards

Instructional Planning Toolkit

A resource for aligning instruction to the cognitive rigor of unpacked standards

Mathematics

Grade 3

LEAD180®

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STANDARD 3.OA.A.1

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Big Idea

Developing understanding of multiplication and division and strategies for multiplication and division within 100.

Cluster

Represent and solve problems involving multiplication and division.

Academic Vocabulary

- **Factor** – number that is multiplied by another number to find an answer or product
- **Multiplication/ Multiply** – operation which can be defined by repeated addition of the same value
- **Product** – the solution when multiplying values

Standard Cognitive Complexity

Content Complexity Rating: Level 1

Standard Progression

2nd Grade Coherence – 2.NBT.2, 2.OA.3 and 2.OA.4
3rd Grade Coherence – 3.OA 2-5 and 3.MD.7

Mathematical Practices and Suggested Questions to Develop Mathematical Thinking

Construct viable arguments and critique the reasoning of others

- How did you decide what the problem was asking you to find?

Attend to precision

- Explain how you know that your answer is the solution to the problem.

Essential Question Stems

- How can we interpret multiplication as repeated addition?
- What is another problem that can represent the equation?
- What does the product represent in the equation?

GRADE-LEVEL STANDARD UNPACKED

Aspects of Rigor	Instructional Targets
Conceptual Understanding	• Interpret products of whole numbers as a total number of objects in a number of group **(DOK 1)**

3.OA.A.1
3.OA.A.2
3.OA.A.3
3.OA.A.4
3.OA.A.5
3.OA.A.6
3.OA.A.7
3.OA.A.8
3.OA.A.9

Procedural Skills and Fluency	• Find the product of multiple groups of objects **(DOK 1)**
Application	• N/A

Suggested Instructional Strategies

On level

The structure of an equal group or array multiplication word problem has a specific structure. Students will need to recognize this structure and interpret the problem by representing it with a multiplication equation. In return they will also need to write an equal group or array word problem using the same structure that is a situation represented by the problem. Students will need practice reading and writing these problems.

Intervention

If the intervention is students not recognizing the structure, then give students the multiplication table from the common core glossary and have them generate similar situations. Students can use premade facts or use number generators to create their own. Students may also need to match a visual representation, equation and word problem. If the intervention needed is due to not understanding the idea of repeated addition or arrays, then students will need to practice the concepts visually, where they can see the groups they are making and count the rows or groups as and not individual items.

Enrichment

As students begin to see the process of writing the equations and word problems, they can apply this to values greater than 10 by 10. To stay within the grade level criteria, students can represent the missing products with a symbol.

Ideas to Support the Standard

Students need to show that they can identify the structure of the multiplication word problem. This is a skill that they will be using as they progress through the operations. Although concrete models are not required, students may need them to better process their understanding.

EXPLANATIONS AND EXAMPLES

When interpreting situations of multiplication, students will need exposure to numerous problems that demonstrate multiplication as equal groups. They should notice a pattern within the problems of key phrases that indicate multiplication. Often problems use the example of "groups of", but they will notice that it can be any word that indicates that there are equal groups, such as, boxes, packages, containers, bags, trays and more. All of these key phrases build the structure of equal group problems. Students that understand the structure will apply this to other standards both in third grade and following grades. This understanding allows students to find a total number of objects not my counting them individually, but by counting them quickly in groups.

Explanation and Examples

Sample Task:

1. Write a situation that would represent 4×6

2. Steve has 4 cans of tennis balls. Each can holds 3 tennis balls. How many tennis balls does Steve have altogether?

   Part A: Write an equation or phrase that represent the situation
   Part B: Write a new situation that can be interpreted using the same equation

The purpose of this task is to help students:

Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7. (3.OA.1)

Solution:

1. An example of a solution is:

   Weber has 4 packages of doughnuts. Each package has 6 doughnuts. How many doughnuts does Weber have altogether?

2. The answer is in two parts that build on each other.

   Part A: $4 \times 3 = 12$ or 4 cans of 3 equals 12 total

   Part B: Kendra has quarters sorted into piles of 4. There are 3 piles. How many quarters does Kendra have in all?

- As a scaffolding piece, have the common core table of mathematical situations available for students to use for structure.

Common Misconception

Focusing in a single key word will cause confusion. Students will see the word "of" and automatically think that it is multiplication, regardless of the question being posed. Use of specific situations and the structure of equal group problems, will give students a solid foundation in recognizing equal group problems. In the same respect, students have learned in previous years that "altogether' and "in all" are key words for addition. This concept is correct because they are repeatedly adding but as an equal number of groups not as single amounts. (example: not 6+7 but 6×7)