

NWEA Assessment Item Illustrating 4.OA.A.2

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Domain: Operations and Algebraic Thinking

4.OA.A: Use the four operations with whole numbers to solve problems.

Calculator Availability: No

Use the information to answer the question.

Arjun ran 2 miles. Lee ran 4 times as many miles as Arjun.

How many miles did Lee run? Enter the answer in the box.

miles

Alignment: 4.OA.A.2: Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

This content is important because it extends students' understanding of additive comparisons to multiplicative comparisons. Instead of finding how much to add to a quantity to find a total, students need to find what factor a quantity must be multiplied by in order to find the total. The language in the item reflects this shift from additive to multiplicative comparison because students are told that "Lee ran 4 times as many miles as Arjun" ran.

Coherence: Solving word problems that involve multiplicative comparison extends work that students started in grade 2, when they solved word problems involving additive comparisons.^{2.OA.A.1} It also extends students' understanding of multiplication from grade 3, when they learned about multiplication as a number of groups with a certain number of objects in each group, and solved multiplication word problems.^{3.OA.A.1, 3.OA.A.3} Understanding multiplicative comparison is an important basis for work that students will do from grade 5 to grade 8. In grade 5, students will learn to interpret whole-number and fraction multiplication as scaling, in which one factor is an amount and the other is a scaling factor. This in turn will support students' understanding of ratio concepts in grade 6^{6.RP.A.1, 6.RP.A.2} and orders of magnitude in grade 8.^{8.EE.A.3}

Rigor: This item attends to conceptual understanding, procedural skill, and application of mathematics in a real-world context. The item attends to conceptual understanding because students must understand which factor is being multiplied by which quantity to get the given result. Students use grade-level procedures to perform the calculations.

Answer Key:

Use the information to answer the question.

Arjun ran 2 miles. Lee ran 4 times as many miles as Arjun.

How many miles did Lee run? Enter the answer in the box.

miles

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