

NWEA Assessment Item Illustrating 5.NF.B.4

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Domain: Number and Operations–Fractions

5.NF.B: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Calculator Availability: No

Multiply.

$$\frac{6}{5} \times \frac{1}{2}$$

Move numbers to the boxes to show the answer.

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Alignment: 5.NF.B.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

The numbers in this item were selected to include a fraction that has a numerator that is greater than the denominator. Students in grade 5 are expected to have fluency with all forms of fractions, including fractions like $6/5$ or fractions shown in mixed-number form. The chosen numbers also allow for multiple approaches. An algorithm could be used, but students with a strong conceptual foundation could also find half of $6/5$ by recognizing that half of 6 parts of 5 is 3 parts of 5. Although this item does not assess conceptual understanding, before learning the algorithm students develop the foundational understanding that $6/5 \times 1/2$ means 6 parts when $1/2$ is portioned into 5 equal parts.

Coherence: Students were formally introduced to multiplication with whole numbers in grade 3 when the focus was on multiplication as equal groups.^{3.OA.A.1} In grade 4, the concept of multiplication as a comparison was developed with whole numbers.^{4.OA.A} Students also began multiplying fractions by whole numbers in grade 4. It should be noted that grade 4 standards built upon the equal-groups interpretation of multiplication, in which students thought about $5 \times 2/3$ as 5 groups of two-thirds. This work continues in grade 5, when students multiply both fractions or whole numbers by fractions and solve problems about finding a fraction of a whole number.^{5.NF.6} The work of finding a fraction of a whole number builds understanding of the idea of multiplication as scaling,^{5.NF.5} which will be developed further in grade 6 when students are introduced to ratios^{6.RP.A} and in grade 7 when they are introduced to scale drawings.^{7.G.A.1}

Rigor: This item attends to procedural skill as it addresses the grade-level computation expectation of multiplying fractions by fractions.

Answer Key: There are multiple equivalent correct responses. One sample correct response is shown.

Multiply.

$$\frac{6}{5} \times \frac{1}{2}$$

Move numbers to the boxes to show the answer.

6									
10									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

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