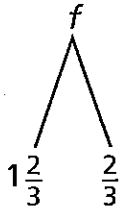

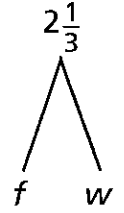


Addition and Subtraction Problem Types

	Result Unknown	Change Unknown	Start Unknown
Add to	<p>A glass contained $\frac{3}{4}$ cup of orange juice. Then $\frac{1}{4}$ cup of pineapple juice was added. How much juice is in the glass now?</p> <p><i>Situation and solution equation:¹</i> $\frac{3}{4} + \frac{1}{4} = c$</p>	<p>A glass contained $\frac{3}{4}$ cup of orange juice. Then some pineapple juice was added. Now the glass contains 1 cup of juice. How much pineapple juice was added?</p> <p><i>Situation equation:</i> $\frac{3}{4} + c = 1$ <i>Solution equation:</i> $c = 1 - \frac{3}{4}$</p>	<p>A glass contained some orange juice. Then $\frac{1}{4}$ cup of pineapple juice was added. Now the glass contains 1 cup of juice. How much orange juice was in the glass to start?</p> <p><i>Situation equation</i> $c + \frac{1}{4} = 1$ <i>Solution equation:</i> $c = 1 - \frac{1}{4}$</p>
Take from	<p>Micah had a ribbon $\frac{5}{6}$ yard long. He cut off a piece $\frac{1}{6}$ yard long. What is the length of the ribbon that is left?</p> <p><i>Situation and solution equation:</i> $\frac{5}{6} - \frac{1}{6} = r$</p>	<p>Micah had a ribbon $\frac{5}{6}$ yard long. He cut off a piece. Now the ribbon is $\frac{4}{6}$ yard long. What is the length of the ribbon he cut off?</p> <p><i>Situation equation:</i> $\frac{5}{6} - r = \frac{4}{6}$ <i>Solution equation:</i> $r = \frac{5}{6} - \frac{4}{6}$</p>	<p>Micah had a ribbon. He cut off a piece $\frac{1}{6}$ yard long. Now the ribbon is $\frac{4}{6}$ yard long. What was the length of the ribbon he started with?</p> <p><i>Situation equation:</i> $r - \frac{1}{6} = \frac{4}{6}$ <i>Solution equation:</i> $r = \frac{4}{6} + \frac{1}{6}$</p>

¹A situation equation represents the structure (action) in the problem situation. A solution equation shows the operation used to find the answer.

Grade 5

	Total Unknown	Addend Unknown	Both Addends Unknown
	<p>A baker combines $1\frac{2}{3}$ cups of white flour and $\frac{2}{3}$ cup of wheat flour. How much flour is this altogether?</p>	<p>Of the $2\frac{1}{3}$ cups of flour a baker uses, $1\frac{2}{3}$ cups are white flour. The rest is wheat flour. How much wheat flour does the baker use?</p>	<p>A baker uses $2\frac{1}{3}$ cups of flour. Some is white flour and some is wheat flour. How much of each type of flour does the baker use?</p>
	<p>Math drawing:¹</p>	<p>Math drawing:</p>	<p>Math drawing:</p>
<p>Put Together/ Take Apart</p>			
	<p>Situation and solution equation: $1\frac{2}{3} + \frac{2}{3} = f$</p>	<p>Situation equation: $2\frac{1}{3} = 1\frac{2}{3} + f$ Solution equation: $f = 2\frac{1}{3} - 1\frac{2}{3}$</p>	<p>Situation equation $2\frac{1}{3} = f + w$</p>

¹These math drawings are called math mountains in Grades 1–3 and break apart drawings in Grades 4 and 5.

Problem Types (continued)

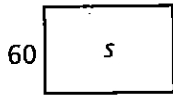
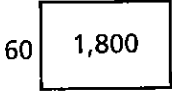
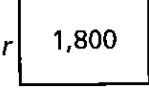
Addition and Subtraction Problem Types (continued)

	Difference Unknown	Greater Unknown	Smaller Unknown
Additive Comparison¹	<p>At a zoo, the female rhino weighs $1\frac{3}{5}$ tons. The male rhino weighs $2\frac{2}{5}$ tons. How much more does the male rhino weigh than the female rhino?</p> <p>At a zoo, the female rhino weighs $1\frac{3}{5}$ tons. The male rhino weighs $2\frac{2}{5}$ tons. How much less does the female rhino weigh than the male rhino?</p>	<p>Leading Language At a zoo, the female rhino weighs $1\frac{3}{5}$ tons. The male rhino weighs $\frac{4}{5}$ ton more than the female rhino. How much does the male rhino weigh?</p> <p>Misleading Language At a zoo, the female rhino weighs $1\frac{3}{5}$ tons. The female rhino weighs $\frac{4}{5}$ ton less than the male rhino. How much does the male rhino weigh?</p>	<p>Leading Language At a zoo, the male rhino weighs $2\frac{2}{5}$ tons. The female rhino weighs $\frac{4}{5}$ ton less than the male rhino. How much does the female rhino weigh?</p> <p>Misleading Language At a zoo, the male rhino weighs $2\frac{2}{5}$ tons. The male rhino weighs $\frac{4}{5}$ ton more than the female rhino. How much does the female rhino weigh?</p>
	<p><i>Math drawing:</i></p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">$2\frac{2}{5}$</div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">$1\frac{3}{5}$</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">d</div> </div> </div> <p><i>Situation equation:</i> $1\frac{3}{5} + d = 2\frac{2}{5}$ or $d = 2\frac{2}{5} - 1\frac{3}{5}$</p> <p><i>Solution equation:</i> $d = 2\frac{2}{5} - 1\frac{3}{5}$</p>	<p><i>Math drawing:</i></p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">m</div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">$1\frac{3}{5}$</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">$\frac{4}{5}$</div> </div> </div> <p><i>Situation and solution equation:</i> $1\frac{3}{5} + \frac{4}{5} = m$</p>	<p><i>Math drawing:</i></p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">$2\frac{2}{5}$</div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">f</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">$\frac{4}{5}$</div> </div> </div> <p><i>Situation equation</i> $f + \frac{4}{5} = 2\frac{2}{5}$ or $f = 2\frac{2}{5} - \frac{4}{5}$</p> <p><i>Solution equation:</i> $f = 2\frac{2}{5} - \frac{4}{5}$</p>

¹A comparison sentence can always be said in two ways. One way uses *more*, and the other uses *fewer* or *less*. Misleading language suggests the wrong operation. For example, it says *the female rhino weighs $\frac{4}{5}$ ton less than the male*, but you have to add $\frac{4}{5}$ ton to the female's weight to get the male's weight.

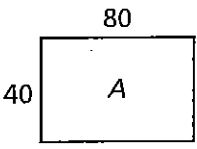
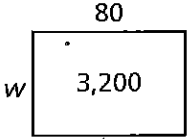
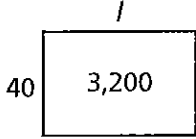
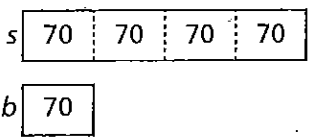
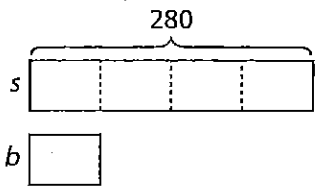
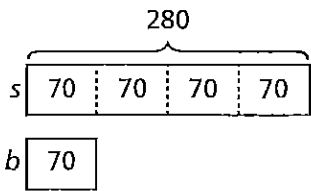
Multiplication and Division Problem Types

	Unknown Product	Group Size Unknown	Number of Groups Unknown
Equal Groups	<p>A teacher bought 10 boxes of pencils. There are 20 pencils in each box. How many pencils did the teacher buy?</p> <p><i>Situation and solution equation:</i> $p = 10 \cdot 20$</p>	<p>A teacher bought 10 boxes of pencils. She bought 200 pencils in all. How many pencils are in each box?</p> <p><i>Situation equation:</i> $10 \cdot n = 200$</p> <p><i>Solution equation:</i> $n = 200 \div 10$</p>	<p>A teacher bought boxes of 20 pencils. She bought 200 pencils in all. How many boxes of pencils did she buy?</p> <p><i>Situation equation</i> $b \cdot 20 = 200$</p> <p><i>Solution equation:</i> $b = 200 \div 20$</p>

	Unknown Product	Unknown Factor	Unknown Factor
Arrays ¹	<p>An auditorium has 60 rows with 30 seats in each row. How many seats are in the auditorium?</p> <p><i>Math drawing:</i></p>  <p><i>Situation and solution equation:</i> $s = 60 \cdot 30$</p>	<p>An auditorium has 60 rows with the same number of seats in each row. There are 1,800 seats in all. How many seats are in each row?</p> <p><i>Math drawing:</i></p>  <p><i>Situation equation:</i> $60 \cdot n = 1,800$</p> <p><i>Solution equation:</i> $n = 1,800 \div 60$</p>	<p>The 1,800 seats in an auditorium are arranged in rows of 30. How many rows of seats are there?</p> <p><i>Math drawing:</i></p>  <p><i>Situation equation</i> $r \cdot 30 = 1,800$</p> <p><i>Solution equation:</i> $r = 1,800 \div 30$</p>

¹We use rectangle models for both array and area problems in Grades 4 and 5 because the numbers in the problems are too large to represent with arrays.

Multiplication and Division Problem Types (continued)

	Unknown Product	Unknown Factor	Unknown Factor
Area	<p>Sophie's backyard is 80 feet long and 40 feet wide. What is the area of Sophie's backyard?</p> <p><i>Math drawing:</i></p>  <p><i>Situation and solution equation:</i> $A = 80 \cdot 40$</p>	<p>Sophie's backyard has an area of 3,200 square feet. The length of the yard is 80 feet. What is the width of the yard?</p> <p><i>Math drawing:</i></p>  <p><i>Situation equation:</i> $80 \cdot w = 3,200$</p> <p><i>Solution equation:</i> $w = 3,200 \div 80$</p>	<p>Sophie's backyard has an area of 3,200 square feet. The width of the yard is 40 feet. What is the length of the yard?</p> <p><i>Math drawing:</i></p>  <p><i>Situation equation:</i> $l \cdot 40 = 3,200$</p> <p><i>Solution equation:</i> $l = 3,200 \div 40$</p>
Multiplicative Comparison	<p>Whole Number Multiplier</p> <p>Sam has 4 times as many marbles as Brady has. Brady has 70 marbles. How many marbles does Sam have?</p> <p><i>Math drawing:</i></p>  <p><i>Situation and solution equation:</i> $s = 4 \cdot 70$</p>	<p>Whole Number Multiplier</p> <p>Sam has 4 times as many marbles as Brady has. Sam has 280 marbles. How many marbles does Brady have?</p> <p><i>Math drawing:</i></p>  <p><i>Situation equation:</i> $4 \cdot b = 280$</p> <p><i>Solution equation:</i> $b = 280 \div 4$</p>	<p>Whole Number Multiplier</p> <p>Sam has 280 marbles. Brady has 70 marbles. The number of marbles Sam has is how many times the number Brady has?</p> <p><i>Math drawing:</i></p>  <p><i>Situation equation:</i> $m \cdot 70 = 280$</p> <p><i>Solution equation:</i> $m = 280 \div 70$</p>

