## Lesson 5: A New Way to Interpret $a$ over $b$

Let's investigate what a fraction means when the numerator and denominator are not whole numbers.

### 5.1: Recalling Ways of Solving

Solve each equation. Be prepared to explain your reasoning.

$0.07=10m$

$10.1=t+7.2$

### 5.2: Interpreting $\frac{a}{b}$

Solve each equation.

1. $35=7x$
2. $35=11x$
3. $7x=7.7$
4. $0.3x=2.1$
5. $\frac{2}{5}=\frac{1}{2}x$

#### Are you ready for more?

Solve the equation. Try to find some shortcuts.

$\frac{1}{6}⋅\frac{3}{20}⋅\frac{5}{42}⋅\frac{7}{72}⋅x=\frac{1}{384}$

### 5.3: Storytime Again

Take turns with your partner telling a story that might be represented by each equation. Then, for each equation, choose one story, state what quantity $x$ describes, and solve the equation. If you get stuck, consider drawing a diagram.

$0.7+x=12$

$\frac{1}{4}x=\frac{3}{2}$

### Lesson 5 Summary

In the past, you learned that a fraction such as $\frac{4}{5}$ can be thought of in a few ways.

* $\frac{4}{5}$ is a number you can locate on the number line by dividing the section between 0 and 1 into 5 equal parts and then counting 4 of those parts to the right of 0.
* $\frac{4}{5}$ is the share that each person would have if 4 wholes were shared equally among 5 people. This means that $\frac{4}{5}$ is the result of *dividing* 4 by 5.

We can extend this meaning of *a fraction as a quotient* to fractions whose numerators and denominators are not whole numbers. For example, we can represent 4.5 pounds of rice divided into portions that each weigh 1.5 pounds as: $\frac{4.5}{1.5}=4.5÷1.5=3$. In other words, $\frac{4.5}{1.5}=3$ because the quotient of 4.5 and 1.5 is 3.

Fractions that involve non-whole numbers can also be used when we solve equations.

Suppose a road under construction is $\frac{3}{8}$ finished and the length of the completed part is $\frac{4}{3}$ miles. How long will the road be when completed?

We can write the equation $\frac{3}{8}x=\frac{4}{3}$ to represent the situation and solve the equation.

The completed road will be $3\frac{5}{9}$ or about 3.6 miles long.

$\begin{matrix}\frac{3}{8}x&=\frac{4}{3}\\x&=\frac{\frac{4}{3}}{\frac{3}{8}}\\x&=\frac{4}{3}⋅\frac{8}{3}\\x&=\frac{32}{9}=3\frac{5}{9}\end{matrix}$



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