Teacher Notes

Lesson 8: Equivalent Ratios Defined Through the Value of a Ratio

Classwork

Exercise 1

A:B $\frac{A}{B}$ The value of the ratio

Circle any equivalent ratios from the list below.

Ratio: 1:2 $\frac{1}{2}$ $\frac{5}{10}$

Ratio: 5:10

Ratio: 6:16 $\frac{6}{16}$ $\frac{12}{32}$

Ratio: 12:32

Find the value of the following ratios, leaving your answer as a fraction, but rewrite the fraction using the largest possible unit.

Ratio: 1:2 $\frac{1}{2}$ Value of the Ratio: $\frac{1}{2}$

Ratio: 5:10 $\frac{5}{10} \div \frac{5}{5}$ Value of the Ratio: $\frac{1}{2}$

Ratio: 6:16 $\frac{6}{16} \div 2$ Value of the Ratio: $\frac{3}{8}$

Ratio: 12:32 $\frac{12}{32}$ Value of the Ratio: $\frac{3}{8}$

What do you notice about the value of the equivalent ratios?

The value of the ratio is the same for equivalent ratios.

Exercise 2

Here is a theorem: If $A:B$ with $B \neq 0$ and $C:D$ with $D \neq 0$ are equivalent, then they have the same value: $\frac{A}{B} = \frac{C}{D}$.

This is essentially stating that if two ratios are equivalent, then their values are the same (when they have values).

Can you provide any counterexamples to the theorem above?

There are no counter examples. This theorem is always true!!

Exercise 3

Taivon is training for a duathlon, which is a race that consists of running and cycling. The cycling leg is longer than the running leg of the race, so while Taivon trains, he rides his bike more than he runs. During training, Taivon runs 4 miles for every 14 miles he rides his bike.

a. Identify the ratio associated with this problem and find its value.

4:14

$\frac{4}{14} \div 2 = \frac{2}{7}$ is the value of the ratio.

The ratio of the # of miles is ran to the # of miles he cycled is 4:14, & the value of the ratio is 2/7. The ratio of the # of miles he cycled to the number of miles he ran is 14:4, & the value of the ratio is 7/2.

Use the value of each ratio to solve the following.

b. When Taivon completed all of his training for the duathlon, the ratio of total number of miles he ran to total number of miles he cycled was 80: 280. Is this consistent with Taivon's training schedule? Explain why or why not. 80:280

$\frac{80}{280} \div 4 = \frac{2}{7}$

This is consistent b/c the ratio of the # of miles he ran to the # of miles he cycled, 80:280, has the value of $\frac{2}{7}$, which is the same value as the ratio 4:14.

c. In one training session, Taivon ran 4 miles and cycled 7 miles. Did this training session represent an equivalent ratio of the distance he ran to the distance he cycled? Explain why or why not.

$\frac{4}{7} \neq \frac{2}{7}$

The training session does not represent an equiv. ratio of the distance he ran to the distance he cycled b/c the value of the ratio in this instance is $\frac{4}{7} \neq \frac{2}{7}$.