Lesson 11: Ratios of Fractions and Their Unit Rates

Classwork

**Example 1: Who is Faster?**

During their last workout, Izzy ran $2\frac{1}{4} $miles in $15$ minutes and her friend Julia ran $3\frac{3}{4}$ miles in $25$ minutes. Each girl thought she was the faster runner. Based on their last run, which girl is correct? Use any approach to find the solution.

**Example 2: Is Meredith Correct?**

A turtle walks $\frac{7}{8}$ of a mile in $50$ minutes. What is the unit rate expressed in miles per hour?

* 1. To find the turtle’s unit rate, Meredith wrote the following complex fraction. Explain how the fraction $\frac{5}{6}$ was obtained.

$$ \frac{ \left(\frac{7}{8}\right) }{\left(\frac{5}{6}\right)}$$

* 1. Determine the unit rate, expressed in miles per hour.

Exercises

1. For Anthony’s birthday, his mother is making cupcakes for his $12$ friends at his daycare. The recipe calls for $3\frac{1}{3}$ cups of flour. This recipe makes $2\frac{1}{2}$ dozen cupcakes. Anthony’s mother has only $1$ cup of flour. Is there enough flour for each of his friends to get a cupcake? Explain and show your work.

1. Sally is making a painting for which she is mixing red paint and blue paint. The table below shows the different mixtures being used.

|  |  |
| --- | --- |
| Red Paint (Quarts) | Blue Paint (Quarts) |
| $$1\frac{1}{2}$$ | $$2\frac{1}{2}$$ |
| $$2\frac{2}{5}$$ | $$4$$ |
| $$3\frac{3}{4}$$ | $$6\frac{1}{4}$$ |
| $$4$$ | $$6\frac{2}{3}$$ |
| $$1.2$$ | $$2$$ |
| $$1.8$$ | $$3$$ |

* 1. What is the unit rate for the values of the amount of blue paint to the amount of red paint?
	2. Is the amount of blue paint proportional to the amount of red paint?
	3. Describe, in words, what the unit rate means in the context of this problem.

Problem Set

Lesson Summary

A fraction whose numerator or denominator is itself a fraction is called a **complex fraction**.

Recall: A **unit rate** is a rate, which is expressed as $\frac{A}{B} $units of the first quantity per $1$ unit of the second quantity for two quantities $A$ and $B$.

For example: If a person walks $2\frac{1}{2}$ miles in $1\frac{1}{4}$ hours at a constant speed, then the unit rate is

$\frac{ 2\frac{1}{2} }{1\frac{1}{4}}=\frac{ \frac{5}{2} }{\frac{5}{4}}=\frac{5}{2}∙\frac{4}{5}=2$. The person walks $2$ mph.

* + - 1. Determine the quotient: $2\frac{4}{7}÷1\frac{3}{6}$
1. One lap around a dirt track is $\frac{1}{3}$ mile. It takes Bryce $\frac{1}{9}$ hour to ride one lap. What is Bryce’s unit rate, in miles, around the track?
2. Mr. Gengel wants to make a shelf with boards that are $1\frac{1}{3}$ feet long. If he has an $18$-foot board, how many pieces can he cut from the big board?
3. The local bakery uses $1.75$ cups of flour in each batch of cookies. The bakery used $5.25$ cups of flour this morning.
	1. How many batches of cookies did the bakery make?
	2. If there are $5$ dozen cookies in each batch, how many cookies did the bakery make?
4. Jason eats $10$ ounces of candy in $5$ days.
	1. How many pounds will he eat per day? (Recall: $16$ ounces $=1$ pound)
	2. How long will it take Jason to eat $1$ pound of candy?