Lesson 22: Getting the Job Done—Speed, Work, and Measurement Units

Classwork

If an object is moving at a constant rate of speed for a certain amount of time, it is possible to find how far the object went by multiplying the rate and the time. In mathematical language, we say Distance Rate Time.

Example 1

**Walker:** Substitute the walker’s distance and time into the equation and solve for the rate of speed.

Distance = Rate Time

*Hint: Consider the units that you want to end up with. If you want to end up with the rate (feet/second), then divide the distance (feet) by time (seconds).*

**Runner:** Substitute the runner’s time and distance into the equation to find the rate of speed.

Distance = Rate Time

Example 2

Part 1: Chris Johnson ran the -yard dash in seconds. What is the rate of speed? Round any answer to the nearest hundredth.

Distance = Rate Time

Part 2: In Lesson 21, we converted units of measure using unit rates. If the runner were able to run at a constant rate, how many yards would he run in an hour? This problem can be solved by breaking it down into two steps. Work with a partner, and make a record of your calculations.

* 1. How many yards would he run in one minute?
	2. How many yards would he run in one hour?

We completed that problem in two separate steps, but it is possible to complete this same problem in one step. We can multiply the yards per second by the seconds per minute, then by the minutes per hour.

Cross out any units that are in both the numerator and denominator in the expression because these cancel each other out.

Part 3: How many miles did the runner travel in that hour? Round your response to the nearest tenth.

Cross out any units that are in both the numerator and denominator in the expression because they cancel out.

Exercises: Road Trip

Exercise 1

I drove my car on cruise control at miles per hour for hours without stopping. How far did I go?

Cross out any units that are in both the numerator and denominator in the expression because they cancel out.

Exercise 2

On the road trip, the speed limit changed to miles per hour in a construction zone. Traffic moved along at a constant rate ( mph), and it took me minutes ( hours) to get through the zone. What was the distance of the construction zone? (Round your response to the nearest hundredth of a mile.)

Lesson Summary

Distance, rate, and time are related by the formula.

Knowing any two of the values allows the calculation of the third.

Problem Set

1. If Adam’s plane traveled at a constant speed of miles per hour for six hours, how far did the plane travel?
2. A Salt March Harvest Mouse ran a centimeter straight course race in seconds. How fast did it run?
3. Another Salt Marsh Harvest Mouse took seconds to run a centimeter race. How fast did it run?
4. A slow boat to China travels at a constant speed of miles per hour for hours. How far was the voyage?
5. The Sopwith Camel was a British, First World War, single-seat, biplane fighter introduced on the Western Front in 1917. Traveling at its top speed of mph in one direction for hours, how far did the plane travel?
6. A world-class marathon runner can finish miles in hours. What is the rate of speed for the runner?
7. Banana slugs can move at cm per minute. If a banana slug travels for hours, how far will it travel?