

DELTA MATH SCIENCE PARTNERSHIP INITIATIVE

M³ Summer Institutes

(Math, Middle School, MS Common Core)

Ratio Word Problems

Common Core State Standards:

6.RP.3b

Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

7.NS.3

Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)

A Guide to Solving Word Problems:

1. Read the problem carefully as many times as necessary until you understand the situation.
2. Draw a sketch or diagram, underline any key words, identify any formulas that need to be used.
3. Choose a letter to represent the quantity you want to find and label accordingly.
4. Write an equation and solve.
5. Check the solution with the information in the original word problem. Did you answer the question the problem is asking? Does the answer make sense?

Word Problems Involving Work

When a word problem has information about getting a job done, then you know the equation you want to use as a set up is the following.

$$\text{Work} = (\text{Rate of work}) \times (\text{Time worked}) \text{ or } W = rt$$

The rate of work refers to a per hour rate (how much of the job gets done in one hour). For example, the rate of work for a person who completes a job in 3 hours is 1 job/3 hours or $1/3$ of the job per hour. In general, if a job can be completed in t hours, then the rate of work is $1/t$ of the job per hour.



Practice:

1. Liza can paint the kitchen in 5 hours. David can paint the same kitchen in 3 hours. If they work together, how long will it take to paint the kitchen?

2. Rodney and Tomaso can build a cabinet together in 12 hours. Rodney can build the cabinet alone in 16 hours. How long will it take Tomaso to build the cabinet alone?

3. An Olympic sized pool can be filled by pipe A in 18 hours and by pipe B in 12 hours. There is also a drain pipe that drains the entire pool in 8 hours. If the valves of pipe A, pipe B and the drain pipe are open, how long will it take to fill the pool?

4. In the Klysler Auto Factory, robots assemble cars. If 3 robots can assemble 17 cars in 10 minutes, how many cars can 14 robots assemble in 45 minutes if all robots work at the same rate all the time?

5. Three painters can paint 4 houses in 5 days. How long would it take 7 painters to paint 18 houses if all work was done at the same rate all the time?

6. If Sherwin can paint the house in 2 days working by himself and William can paint the house in 4 days working by himself, how many days should it take Sherwin and William together?

Calvin & Hobbes By Bill Watterson

