Helpful Hints for L.5.4

There are several keys to understanding section P.4.4. The first is to remember that multiplication and division work together to create fact families. For example, since $3 \cdot 4 = 12$ you know that $12 \div 4 = 3$ and at the same time, you can figure out that $12 \div 3 = 4$.

The second key to understanding this section is to know the vocabulary being used. The "Ratio" is simply the *rate* at which things travel or flow. For example if a problem states that a train traveled at 90 miles per hour, you know that 90 miles per hour is the "Ratio" they are looking for. The "Factor" referred to in these problems is the amount of time that objects travel or flow. In our example, if the train travels at 90 miles per hour *for 3 hours*, then you know that the "Factor" they are asking for is 3 hours. To find the distance the train travels in that time (called the "Product" by the program) you use the formula $Rate \cdot Time = Distance$ **or** $Ratio \cdot Factor = Product$. (Just like the fact family $3 \cdot 4 = 12$. 3 is the ratio, 4 is the factor and 12 is the product) This means that the train traveled 270 miles total.

Sometimes you are given ***either*** the Ratio or the Factor and the Product. In that case, you need to use division to find the missing value (Just like the division part of the fact family $12 \div 3 = 4$) As an example if a problem says that an airplane traveled at 375 miles per hour for 1500 miles, you would need to find out how long it traveled to complete the problem. You have been given the *Ratio* and the *Product* you need to find the *Factor.* To do this, you use the formula $Product \div Ratio = Factor$. So $1500 \div 375 = 4$. This means that the airplane flew for 4 hours. If you are given the *Factor* and the *Product* you would use the formula: $Product \div Factor = Ratio$.

Just remember: *Ratio* = rate (in miles per hour)
Factor = time
Product = Distance/or volume

AND the formulas: $Ratio \cdot Factor = Product$
$Product \div Ratio = Factor$
$Product \div Factor = Ratio$