Your teenage daughter sprinted the 50-yard dash. How many yards per second did she run? Your plane flew from Chicago to Dallas — but how fast? On a drive from the city to the country, you took the interstate and later a dirt road. What's the average number of miles per hour you ended up driving?

To answer these questions you have to consider RATE — the speed, for example, at which your daughter ran her race; TIME — how long it took your plane to reach its destination; and DISTANCE — the total mileage you drove on your road trip.

Problems about rate, distance, and time are solved by using three simple formulas. (Formulas are rules that are always true.) To remember the formulas, write the letters D (for Distance), R (for Rate), and T (for Time) in a triangle this way:

Distance = Rate x Time, or D = RT
Rate = Distance/Time, or R = D/T
Time = Distance/Rate, or T = D/R

Follow three steps to answer rate, distance, and time problems:

**Step 1:** Write the formula you need by looking for the key words in each question.

**Step 2:** Substitute the numbers in the problem for the letters they stand for in the formula.

**Step 3:** Do the arithmetic (either multiply or divide, depending on the formula).

**Example:** Kai drove 450 miles at 60 miles an hour. How much time did his trip take?

**Step 1:** The problem asks how long Kai's trip took, or the amount of time. So write the formula for time: Time = Distance/Rate or T = D/R.

**Step 2:** The problem tells you the distance driven, 450 miles, and the rate, 60 miles an hour. Substitute these numbers for the letters in the formula: T = 450/60.

**Step 3:** The formula for Time requires division. Divide 450 by 60 to get: $7 \frac{1}{2}$ hours, or T = $7 \frac{1}{2}$ hours (7 hours and 30 minutes).

**Example:** Trang hiked 1.5 miles per hour for 10 hours. How far did she hike?

**Step 1-Formula:** The problem asks how far: Distance = Rate x Time or D = RT

**Step 2-Substitution:** Rate, or miles per hour, is given, as is the time: D = 1.5 x 10.

**Step 3-Arithmetic:** In the formula for Distance, you multiply, and the answer is 15 miles.
NOW YOU TRY IT

1. During an anti-war march, Amallia covered 2 1/2 miles for every hour she walked. She walked for 4 hours. At the end of the peace march, what distance had she walked?

Formula: ________________________________ or ____________________
Substitution: ____________________________
Arithmetic: _______________ miles

2. An airplane flies 2,004 miles in 4 hours. What is the speed at which the plane flies?

Formula: ________________________________ or ____________________
Substitution: ____________________________
Arithmetic: _______________ miles per hour

3. Malik jogs 7.5 miles at the rate of 5 miles an hour. How long does his morning jog take?

Formula: ________________________________ or ____________________
Substitution: ____________________________
Arithmetic: _______________ hours

YOU’RE ON YOUR OWN

Keep following Step 1, Step 2, and Step 3:

1. Joanna drove at a steady speed of 65 miles per hour on the interstate. The distance she drove was 1,690 miles. How long did it take Joanna to complete her trip?

Answer: _______________ hours

2. Dezray rides her bike at the rate of 4.2 miles an hour. If she bicycles for 3.7 hours, how far has she traveled?

Answer: _______________ miles

3. A train travels 864 miles in 8 hours. How fast is the train traveling?

Answer: _______________ miles per hour

NOW YOU TRY IT: 1. Distance = Rate x Time or 
D = RT; D = 2 1/2 x 4; multiply: 10 miles

2. Speed = Distance/Time or R = D/T; R = 2,004/4; divide: 501 miles per hour

3. Time = Distance/Rate or T = D/R; T = 7.5/5; divide: 1.5 hours or 1 1/2 hours

YOU’RE ON YOUR OWN: 1. Formula: Time = Distance/Rate or T = D/R; Substitution: T = 1.5 hours or 1 1/2 hours
Substitution: 1.5 = D/R; Arithmetic: Divide: 1.5 x 1.5 = 2.25 miles

2. Formula: Distance = Rate x Time or D = RT; Substitution: D = 4.2 x 3.7; Arithmetic: Multiply: 4.2 miles per hour

3. Formula: Rate = Distance/Time or R = D/T; Substitution: R = 864/8; Arithmetic: Divide: 108 miles per hour