

## Chapter Five

# Simple Interest

A simple interest word problem is nothing more than one special type of basic percent word problem. But we did not include problems of this type in the previous chapter and, because these problems are very common, we have devoted this separate chapter to simple interest word problems.

Simple interest refers to earning interest on money put aside for investment purposes, usually in a bank or other financial institution. It is a special type of percent problem where the interest rate that the invested money will earn will be expressed as a percent. Thus, the problem might say that the interest rate on deposited funds is 2% annually. Or the problem might say that the money earns interest at the rate of  $1\frac{1}{4}\%$  per year. As we did in the previous chapter, we will need to change the percent to a decimal by dropping the percent sign and dividing by 100. This step is actually more difficult here than it was in the previous chapter, because interest rates very often include fractional components. Notice that earlier in this paragraph we spoke of an interest rate of  $1\frac{1}{4}\%$ . To change  $1\frac{1}{4}\%$  to a decimal, we must first change the fraction  $\frac{1}{4}$  to a decimal. We do this by division:  $\frac{1}{4}$  means 1 divided by 4. We perform that division:  $1 \div 4 = 0.25$  and,

instead of  $1\frac{1}{4}\%$ , we write 1.25%. Now we can drop the percent sign and divide by 100, as before, giving us  $1.25 \div 100 = 0.0125$ . (We will not use the “is over of” method in this chapter.)

Example: Zachary has been working at an after school job for the past year. He has saved \$525 that he plans to put in the bank. The bank is paying  $1\frac{3}{4}\%$  interest annually. If Zachary puts his money in that bank and leaves it there for two years, how much money will he have at the end of the two years?

The first step in all interest problems is to change the percent to a decimal. First we must change the fraction  $\frac{3}{4}$  to a decimal by division:  $3 \div 4 = 0.75$ . Now the interest rate becomes 1.75% annually. We will now drop the percent sign and divide by 100:  $1.75 \div 100 = 0.0175$ . Zachary will earn interest for the first time at the end of one year. To determine how much interest he will earn, we need to multiply the interest rate (in decimal form) by the amount of money Zachary has deposited:  $0.0175 \times \$525 = \$9.19$ . Now Zachary has  $\$525 + \$9.19 = \$534.19$ . Since he plans to leave the money for another year, he will earn interest again at the end of the second year. This time he will earn  $0.0175 \times \$534.19 = \$9.35$ . (Notice that Zachary will earn more interest in the second year than he did in the first year, because he has more money in the bank at the start of the second year than he did at the start of the first year.) At the end of two years, Zachary will have  $\$534.19 + \$9.35 = \$543.54$ .

Let’s try another type of example problem.

Example: Mrs. Smith wants to buy a new couch one year from now. She plans to spend \$1,000 on her purchase. To be sure she will have the money available when she needs it, she wants to put enough money in the bank now where it will earn 3% per year. How much money should she deposit now in order to have \$1,000 one year from now?