

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**SIMPLE INTEREST****VS****COMPOUND INTEREST**

|   |   |
|---|---|
| $I = P \times R \times T$ <p>I = the total interest<br/> P = the principal (the amount borrowed)<br/> R = the interest rate (as a decimal)<br/> T = the time in years</p> | $A = P (1 + i)^n$ <p>A = the total amount to be repaid (principal + interest)<br/> P = the principal<br/> i = the interest rate (as a decimal)<br/> n = the number of periods</p> |
| <b>EXAMPLE</b><br>If you put \$10,000 into a saving account at 5% for 5 years, what will the interest amount be for both?   |   |
| $I = \$10,000 \times 0.05 \times 5$ $I = \$2,500$   | $A = \$10,000 (1 + 0.05)^5$ $A = \$12,762$ <p style="text-align: center;">Therefore total interest gained \$2,762</p>   |
| <b>TRY THIS...</b><br>If you invested \$5,000 at 8% for 30 years, what will the interest amount be for both?  |   |
| $I = \$5,000 \times 0.08 \times 30$ $I = \$12,000$  | $A = \$5,000 (1 + 0.08)^{30}$ $A = \$50,313$ $\text{Interest} = \$45,313$   |

Note:

[www.getsmarteraboutmoney.com](http://www.getsmarteraboutmoney.com) has an online interactive compound interest calculator.

## Simple and Compound Interest Questions:

1. How much interest would you earn on an \$8,000.00 deposit with an annual interest rate of 5 percent with simple interest over six years? The first calculation has been done for you.

|        | Beginning of the Year | During the Year                              | End of the Year |
|--------|-----------------------|--|-----------------|
| Year 1 | \$8,000               | +(5% of \$8,000=\$400)                       | \$8,400         |
| Year 2 | \$8,400.00            | + (5% of <del>\$8,000</del> \$8,400) = \$400 | 8,800           |
| Year 3 | 8,800                 | +\$400                                       | 9,200           |
| Year 4 | 9,200                 | +\$400                                       | 9,600           |
| Year 5 | 9,600                 | +\$400                                       | 10,000          |
| Year 6 | 10,000                | +\$400                                       | 10,400          |

$I = P \times r \times t$   
 $I = 8000 \times 0.05 \times 6$   
 $I = 2,400$   
 $8000 + 2400 = 10,400$

2. If the same \$8000.00 is compounded annually for six years at 5% interest, how much would you earn?

|        | Beginning of the Year | During the Year             | End of the Year |
|--------|-----------------------|-----------------------------|-----------------|
| Year 1 | \$8,000               | +(5% of \$8,000=\$400)      | \$8,400         |
| Year 2 | \$8,400.00            | + (5% of \$8,400 = \$420)   | \$8,820         |
| Year 3 | \$8,820               | + (5% of \$8,820) = \$441   | \$9,261         |
| Year 4 | \$9,261               | + (5% of \$9,261) = \$463   | \$9,724         |
| Year 5 | \$9,724               | + (5% of \$9,724) = \$486.2 | \$10,210.2      |
| Year 6 | \$10,210.2            | + (5% of 10,210) = \$510.51 | \$10,720.71     |

$A = P(1+i)^n$   
 $A = 8000(1+0.05)^6$   
 $A = 8000(1.05)^6$   
 $A = 10,720$

3. For each year, calculate the difference between simple and compound interest.

|        |                           |
|--------|---------------------------|
| Year 1 | 8400 - 8400 = 0           |
| Year 2 | 8820 - 8800 = 20          |
| Year 3 | 9261 - 9200 = 61          |
| Year 4 | 9724 - 9600 = 124         |
| Year 5 | 10210.2 - 10,000 = 210.2  |
| Year 6 | 10720.71 - 10400 = 320.71 |

← compounded  
 ← simple interest