

**Precalculus**  
**Lesson 5.7: Financial Models**  
**Mrs. Snow, Instructor**

Interest is the money paid for the use of money. Money borrowed is called **principal**. When you borrow money there is a **rate of interest**, expressed as a percent is charged over the amount of time of the loan. Most often the loan is compounded a number of times per year.

**Compound Interest**

Compound interest is calculated by the formula:

$$A(t) = P \left( 1 + \frac{r}{n} \right)^{nt}$$

- A(t)= amount after t years
- P=Principal
- r=interest rate per year
- n=number of times compounded per year
- t=number of years

Calculate and compare the amount of money after one year using different compounding periods.

How much money will you have after one year, if you invest \$1000 at an annual rate of 10% compounded annually, semiannually, quarterly, monthly, and daily?

### Continuously Compounded Interest

Continuously compounded interest uses the base  $e$  and is calculated by the formula:

$$A(t) = Pe^{rt}$$

A(t)=amount after t years

P=Principal

r=interest rate per year

t=number of years

Find the amount after 1 year if a principal investment of \$1000 is invested at an interest rate of 10% per year, compounded continuously

What annual rate of interest compounded annually should you seek if you want to double your investment in 5 years?