

**COMPOUND INTEREST** (15a)

... INVOLVES ADDING IN INTEREST AT REGULAR INTERVALS, SO YOU'RE EARNING INTEREST ON INTEREST!

LET:  $P$  = INITIAL INVESTMENT (\$)  
 $r$  = ANNUAL INTEREST RATE (eg, 2% = 0.02)  
 $n$  = # OF TIMES, PER YEAR, THAT INTEREST IS ADDED IN; # OF COMPOUNDING PERIODS/YEAR

MONTHLY:  $n = 12$       WEEKLY:  $n = 52$       DAILY:  $n = 365$

AFTER THIS TIME...      ... YOU'LL HAVE THIS MUCH \$\$ ...

<p>1 COMPOUNDING PERIOD</p> <p>2      "      "</p> <p>⋮</p> <p><math>n = 1</math> YEAR</p> <p>⋮</p> <p><math>2n = 2</math> YEARS</p>	<p><math>P + P \cdot r \cdot \frac{1}{n} = P \left(1 + \frac{r}{n}\right)^1</math></p> <p><math>P \left(1 + \frac{r}{n}\right) + P \left(1 + \frac{r}{n}\right) \cdot r \cdot \frac{1}{n} = P \left(1 + \frac{r}{n}\right)^2</math></p> <p>⋮</p> <p><math>P \left(1 + \frac{r}{n}\right)^{n-1}</math></p> <p><math>P \left(1 + \frac{r}{n}\right)^{n-2}</math></p> <p>⋮</p> <p><math>P \left(1 + \frac{r}{n}\right)^{n-1}</math></p>
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$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

**USING THE COMPOUND INTEREST FORMULA** (15b)

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

**EX** SUPPOSE \$1000 IS INVESTED AT 3% ANNUAL INTEREST, COMPOUNDED DAILY, FOR 5 YEARS. HOW MUCH MONEY WILL YOU HAVE?

$P = 1000$ ,  $r = 0.03$ ,  $n = 365$ ,  $t = 5$

$$A = 1000 \left(1 + \frac{0.03}{365}\right)^{365 \cdot 5} = \$1,161.83$$

↑  
BE ABLE TO DO THIS ON YOUR CALCULATOR!!