What's Going On?

Checking In

Minds on Whiteboard Basics

Action! Compound Interest

Consolidation Compound Interest Problem Solving

Learning Goal - I will review the finance material from Grade 11 and will be able to solve problems involving compound interest.

Minds on

Whiteboard Basics

Express each time period in years.

40 days > 0.11 yans 10,000 days -> 27.40 y 31,025 days 65 yews

Minds on

Whiteboard Basics

Depositing \$100 per month means depositing how much in each time period?

1 year
$$\rightarrow $|200$$

 $5|00 \times |2$

Minds on

Whiteboard Basics

If you earn \$40,000 in a year. How much do you earn in

one month?

$$\frac{40000}{12} = 3333.33$$

one week? $52 \frac{40000}{57} = 764.23$

one day?
$$\frac{40000}{365} = 104.54$$

6.5 months?

(40000) X 6,5 = 21,666.00 Pel xx 6,5 xx 9 How many payments are made in one year for each payment frequency?

Daily 365 times a year

Weekly 52 times a year (but not 4 times a month!)

Bi-Weekly 26 times per year (every 2 weeks)

Monthly

12 times a year

Semi-monthly 24 times a year (twice a month)

Annually Once a year

Semi-annually 2 times per year (every 6 months)

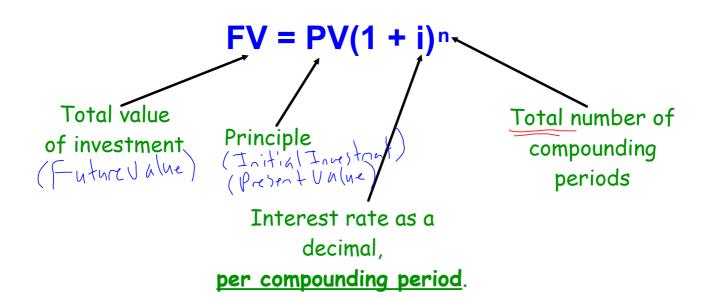
Quarterly 4 times a year (every 3 months)

Predict whether each exponential expression will give a value greater or less than the initial value.

I:4:-13/-1 /A3	F	Jurger than 1
Initial Value (\$)	Exponential Expression	
1,000	1,000(1.0325)1	greatere
30,000	30,000(0.84)2	less, toright
750	750(1.0075)-6	- greater noving to lift
3,250	3,250(1.00125) ²⁴	less - greater toright - moving to lift - larger toright - toright - greater - toright
1,450	$1,450\left(\frac{1}{4}\right)^{5}$	0,29 (675)
68,000	68,000(0.65)-4	

Action!

Compound Interest



Minding Your i's and n's , as a beama

To determine the value of i:

divide the interest rate by the number of compounding periods in a year

Example: If you invested \$2,500 at 3% interest compounded weekly for 3 years.

i = .03/52 = 0.00054

+intsin a year

0.054°/0 per week

Interest Rate

as a decimal

Number of **times** interest is compounded per year.

Minding Your i's and n's

Minding Your i's and n's

To determine the value of n:

year by the number of compounding periods in a year by the number of years the money is invested

Example: If you invested \$2,500 at 3% interest compounded

weekly for 3 years.

 $n = 52 \times 3 = 150$

Number of <u>times</u> interest is compounded <u>per year</u>.

Number of <u>years</u> money will be invested

Example: If you invested \$2,500 at 3% interest compounded weekly for 3 years.

$$FV = PV(1+1)^{n}$$

$$PV = 2500$$

$$1 = \frac{9.03}{52} = 0.0005\%$$

$$0 = 52x3 = 150$$

$$FV = 2500(1+0.005\%)$$

$$FV = 2500(1.0005\%)$$

Minding Your i's and n's

Example: If you invested \$ 342,000 at 2.5%

interest compounded bi-weekly or years.

26/4ea

You decide to invest \$5,000 for 3.5 years at 2.5% interest compounded monthly.

Determine what your initial investment will be worth at maturity.

$$FV = PV(1 + i)^n$$

You decide to invest your money for 30 years at an interest rate of 5.2% compounded monthly.

How much do you need to invest now to have \$100,000 when the investment matures?

$$FV = PV(1 + i)^n$$

Consolidation

Problem Solving with Compound Interest

You have decided to start saving for a car. You decide to deposit \$400 at the end of each month into an account that pays 3.6% per year, compounded monthly.

How much money will you have saved, in total, after 6 months?

Consolidation

Problem Solving with Compound Interest

You want to make sure that you have money available for "fun" while you are away at college.

How much do you need to invest before you go to school, in an account that earns 3.5% interest compounded monthly, to be able to withdraw \$200 per month for 8 months?

Assume that you will withdraw the money at the end of each month, and that you will deposit all of the money one month before the initial withdraw.