"SIMPLE" COMPOUND INTEREST

Comparing Simple Interest to Compound Interest

The SIMPLE way to calculate COMPOUND INTEREST

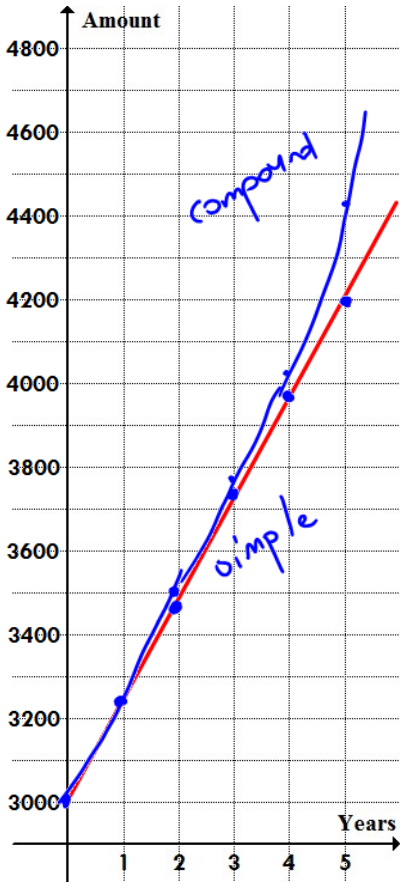
- **Compound Interest** is interest paid on the principal **AND** it's accumulated interest.
- The interest is calculated at regular compounding periods and then added to the principal for the next compounding period.
- **Compounding Period:** The length of time for which interest is calculated before being accumulated.

EXAMPLE

Calculate the **amount** of a $3 000 investment **after each year** for 5 years at 8% **simple interest.** Graph your results on the grid shown.

SIMPLE

Year	Principal	Interest	Total Amount
1	3000	3000(0.08)(1)=240	3240
2	3000	3000(0.08)(1)=240	3480
3	3000	240	3720
4	3000	240	3960
5	3000	240	4200



Using Simple Interest to Calculate Compound Interest

Next, to calculate the **amount** of a $3 000 investment **after** 5 years at 8% **compounded** annually, use the simple interest formula each year on the **principal AND previously accumulated interest.** Graph your results on the same grid as above.

Year	Principal	Interest	Total Amount
1	3000	3000(0.08)(1)=240	3240
2	3240	3240(0.08)(1)=259.20	3499.20
3	3499.20	3499.20(0.08)(1)=279.94	3779.14
4	3779.14	3779.14(0.08)(1)=302.33	4081.47
5	4081.47	4081.47(0.08)(1)=326.52	4407.99

How much more is the compounding investment, compared to the simple interest investment?

4407.99 − 4200 = $207.99

Which type of interest has linear growth? Which type of interest has exponential growth?

- **Simple Interest** has linear growth because
- **Compound Interest** has exponential growth because

SUMMARY

At the end of each time interval, the simple interest formula is used to calculate the interest, which is then added to the principal or previous amount.

EXAMPLE 1

a) $500 is invested at 2.4% interest **compounded annually** for 3 years. Use the simple interest formula to calculate the total amount after 3 years.

Year	Principal	Interest	Total Amount
1	500	$500(0.024)(1)=12$	$512
2	512	$512(0.024)(1)=12.29$	524.29
3	524.29	$524.29(0.024)(1)=12.58$	536.87

b) If the interest was not compounded, how would the final amount be different?

$I = Prt$
$= 500(0.024)(3)$
$= 36$

Simple	Compound
$36	$36.87

∴ $0.87 more with the compound interest

EXAMPLE 2

a) Carlene wants to borrow $7 000 for five years. Compare the growth of this loan at 7% per year, simple interest, to the same loan at 7% per year, compounded annually.

Simple Interest: $I = Prt$
$= 7000(0.07)(5)$
$= 2450$

$A = P + I$
$= 7000 + 2450$
$= \$9450$

Compound Interest:

Year	Principal	Interest	Total Amount
1	7000	$7000(0.07)(1)=490$	7490
2	7490	$7490(0.07)(1)=524.30$	8014.30
3	8014.30	$8014.30(0.07)(1)=561.00$	8575.30
4	8575.30	$8575.30(0.07)(1)=600.27$	9175.57
5	9175.57	$9175.57(0.07)(1)=642.29$	9817.86