INTEREST

How does interest impact finances?

What is interest?

The cost of borrowing

Why does interest exist?

Incentivize lending

What is compound interest?

You deposit $10 000 in a savings account with an annual interest rate of 5%. How much money will you have after 3 years?

$$5\% = \frac{5}{100} = 0.05$$

$$10\,000(0.05) = \$500 \quad \leftarrow \text{interest}$$

$$\$500 \times 3 = \$1500$$

$$+\,10\,000$$
$$\overline{}$$
$$\$\,11\,500$$

SIMPLE INTEREST

In reality it will be <u>compound interest</u> :

$$\$10\,000(0.05) = 500 \qquad \text{OR} \qquad 10\,000(1.05) = 10\,500$$

$$(10\,000+500)(0.05) = 525 \qquad\qquad 10\,500(1.05)\;\; 11\,025$$

$$(10\,000+500+525)(0.05) = 551.25 \qquad 11\,025(1.05) = 11\,576.25$$

$$10\,000(1.05)(1.05)(1.05)\!\nearrow$$

$$10\,000+500+525+551.25 \qquad\qquad = 10\,000(1.05)^3$$

$$= \$\,11\,576.25$$

In Frye's situation, $0.93 is in the bank at 2.25% for 1000 years. How much is it worth now?

$$0.93 \left(\cancel{2.25} \right)^{1000}$$

$$0.93 \left(\underline{1.0225} \right)^{1000} \longrightarrow 102.25\%$$

$$= 4.28 \text{ billion}$$

If $5000 is used on a credit card, at 18.5% interest compounded monthly. If nothing is paid back for two years, how much will be owed?

$$185\% = 0.185$$

$$5000(1.185)^2 = 7021.13$$

↑ without compounding monthly

$$100\% + 185\% = 118.5\% = 1.185$$

with compounding monthly (12 months/year):

$$\frac{18.5\%}{12} = 1.54\% \text{ per month}$$

$$5000(1.0154)^{2(12)} = 7215.42$$

How long will it be before you owe $10 000?

to be continued

Minimum payments

Credit card companies require borrowers to make minimum payments. Why would they do this?