From Simple Interest to Compound Interest

Which option do you think would be worth more? Why?

- $1000 invested at 7% per annum for 2 years
- $1000 invested at 7% per annum for 1 year and then the $1000 plus the interest after 1 year invested for a second year.

Explore

Note: When looking at the spreadsheets

❖ **Another way of saying Present Value (PV) is "Principal"**
❖ **Another way of saying Future Value (FV) is "Amount"**

1. For $1000 invested at 5% **simple interest** per annum for 20 years, calculate the following.

   Hint: *I = Prt*

   a) the interest earned at the end of the 20 years

   b) the interest earned per year

   c) the *Future Value* after 20 years

2. Examine *Spreadsheet A*

   a) Describe how the values in the "Interest" column and "Future Value" Column were calculated

   b) Each new year the "Present Value" changes. Where does this number come from?

3. Examine **Spreadsheet A**

    a) What do you notice about the interest as the years increase? _____

    b) What is the amount after 20 years? _____

    c) How much interest is earned altogether? *Hint: Look at the amount you started out with and the amount you ended up with.*

    d) After how many years is the amount double the initial investment? _____

4. Re-read Question #1 and your answers. Let's compare your Simple Interest calculations to **Spreadsheet A.**

    a) Compare the yearly interest earned.   Which is better?

    b) Compare the total interest earned at the end of 20 years. Which is greater and by how much?

    c) How many years in the spreadsheet does it take to earn the same interest you calculated in Question 1 for 20 years?

5. Use the graph beside **Spreadsheet A** to draw a line graph titled "Future Value of $1000 at 5%".

    -   Horizontal axis is "year"
    -   Vertical axis is "Value ($)"

    a) Does the graph show a straight line or a curve?

    b) What does the shape of the graph tell you about the growth of your savings?

Practice

1. For $2000 invested at 7% **<u>simple interest</u>** per annum for 20 years, calculate the following.

   Hint: *I = Prt*

   a) the interest earned at the end of the 20 years

   b) the interest earned per year

   c) the *Future Value* after 20 years

2. Examine **Spreadsheet B**

   a) What do you notice about the interest as the years increase? _____

   b) What is the amount after 20 years? _____

   c) How much interest is earned altogether? *Hint: Look at the amount you started out with and the amount you ended up with.*

   d) After how many years is the amount double the initial investment? _____

3. Re-read Question #1 and your answers. Let's compare your Simple Interest calculations to **Spreadsheet B.**

   a) Compare the yearly interest earned.   Which is better?

   b) Compare the total interest earned at the end of 20 years. Which is greater and by how much?

   c) How many years in the spreadsheet does it take to earn the same interest you calculated in Question 1 for 20 years?

4. Use the graph beside **Spreadsheet B** to draw a line graph titled "Future Value of $2000 at 7%".

- Horizontal axis is "year"
- Vertical axis is "Value ($)"

a) Does the graph show a straight line or a curve?

b) What does the shape of the graph tell you about the growth of your savings?

5. a) Explain in your own words the difference between simple interest (Question 1) and compound interest (in the table).

b) Why is it called "compound" interest? Hint – google the definition of compound.