In this activity you will use a spreadsheet to calculate simple and compound interest on savings, and investigate the difference between them.

Information sheet

When you invest money in a savings account you will earn **interest**.
The **Annual Equivalent Rate** (AER) is the percentage of your investment that will be earned in a year. When you invest money you should compare the AER offered by different savings accounts as well as the conditions attached, such as time restrictions on withdrawing your money.

Simple interest

In this case you assume that your investment earns the same amount of interest each year. To work out the amount of simple interest your savings will earn over a period of time:

- calculate the amount of interest for one year
- multiply by the number of years.

Example

To work out the simple interest on £300 at 4% for 5 years:

- Interest for 1 year = $\frac{4}{100} \times 300 = £12$
- Total interest after 5 years = £12 × 5 = **£60**

Think about…

What other ways are there to work out 4% of the investment?

Compound interest

Compound interest can be earned daily, weekly, monthly or yearly. At the end of each time period the interest is added to the account. In the next time period, interest is earned on this as well as on the original investment. So the amount of interest earned increases from one period to the next.

Example

To work out the compound interest on £300 at 4% per year for 2 years:

Year	Start of year	Interest	End of year
1	£300	$\frac{4}{100} \times 300 = £12$	£300 + £12 = £312
2	£312	$\frac{4}{100} \times 312 = £12.48$	£312 + £12.48 = £324.48

Interest = £324.48 − £300 = **£24.48**

Think about…

Is there a quicker way to calculate the total amount in the account after each year?

Try these, using the accompanying Excel Spreadsheet.

Worksheet 1 Simple interest

This worksheet has an example to show how simple interest can be worked out using spreadsheet formulae.

Think about…

Can you explain the formula in the interest column in cells D21 to D25?

Do you understand the formula used in cell E21? The 'end of the year' column has been completed using Excel's 'fill down' facility.

Complete the exercise on this worksheet using the tables provided.

Worksheet 2 Compound interest

This worksheet has an example to show how compound interest can be worked out using spreadsheet formulae.

Think about…

Can you explain the formula used in cell D25?
Why does the formula in the interest column change in this example?

Do you understand the formula used in cell E25? The 'end of the year' column has been completed using Excel's 'fill down' facility.

Complete the exercise on this worksheet using the tables provided.

Worksheet 3 Comparing interests

This worksheet shows a bar chart that can be used to compare the amount of interest earned when an amount of money is invested for the same period of time at simple interest and at compound interest.

Think about…

Why do you think the vertical axis has been started at £420, rather than £0?
Why might this be misleading?

Use the spreadsheet to investigate the difference between the amounts of simple and compound interest earned when each of the following are varied:

- amount invested
- rate of interest
- length of time.

At the end of the activity

What are the differences in the way simple interest and compound interest are calculated?

What effect does this have on the amount of interest earned?

What difference does it make to the interest earned when you vary:

- the amount invested
- the rate of interest
- the number of years?

Extension

Use the formulae for simple and compound interest given below to check your answers to the exercises on Excel worksheets 1 and 2.

A = total amount accrued in account P = amount invested (principal)

R = interest rate (as a decimal) T = number of years money is invested

Simple interest	**Compound interest**
$A = P \times R \times T$	$A = P(1 + R)^T$