



### Activity description

In this activity students use an Excel spreadsheet to calculate simple and compound interest.

Students will need to use algebraic and spreadsheet formulae to work out the total amount of interest and the total amount accrued in an account when money is invested for a period of time at a given interest rate.

Students are also asked to investigate the difference between the amounts of interest earned with simple interest compared with compound interest when each of: the amount invested, the rate of interest, and the period of time are varied.

### Suitability

Level 2 (Intermediate/Higher)

Level 1 (Foundation) with extra help

### Time

1–3 hours

### Resources

Student information sheet

Spreadsheet with worksheets

Spreadsheet with answers

*Optional:* slideshow

### Equipment

Calculators, computers, internet access

### Key mathematical language

Interest rate, amount accrued, principal, investment, simple interest, compound interest

### Notes on the activity

The student information sheet gives examples of calculating both simple and compound interest, and is accompanied by an Excel spreadsheet. You may wish to concentrate on just one type of interest, possibly compound interest as this is the type most often used in practice. If you decide to do this, you will need to delete parts of the student sheets and spreadsheet.

There are three worksheets on the spreadsheet. The first worksheet has an example and an exercise about how to use spreadsheet formulae to work out simple interest. The second does the same for compound interest. The

third worksheet shows how a bar chart can be used to compare the amount accrued when an amount is invested at simple interest and at compound interest.

There is more information on interest rates and conditions for savings accounts at: [www.moneyfacts.co.uk](http://www.moneyfacts.co.uk). The website at [www.moneysavingexpert.com/banking/interest-rates#compound](http://www.moneysavingexpert.com/banking/interest-rates#compound) gives more information about savings, including the difference between AER and APR.

### During the activity

Students could work individually or in pairs. They may need individual guidance on the use of spreadsheet formulae.

### Points for discussion

At the beginning of the activity, encourage students to suggest different ways to calculate percentages, in particular using decimals to work out the amount of interest and the total amount in the account at the end of the year. Discuss the answers to the examples on the student sheets.

At the end of the activity, students should be encouraged to compare their findings and discuss what they have learned. Some students may have noticed an apparent error in Example 2 on the Compound Interest Worksheet. At the beginning of year 4, the amount is £498.92 and the interest earned during the year is £17.46, yet the amount at the end of the year is given as £516.39. This apparent error is due to the fact that the spreadsheet does not round values to the nearest pence at each stage. Discuss this with students to ensure that they understand that values they work out by hand may not agree exactly with the spreadsheet.

If possible, include information about real savings accounts on the internet or bank or building society leaflets. Look at the terms and conditions, and ask students to decide whether they are offering simple or compound interest. Discuss the complications arising in practice when someone uses a savings account.

### Extensions

More able students may like to check their answers to the exercises by using the algebraic formulae for simple interest and compound interest.

The use of formulae can be extended to calculating the interest rate when the amount accrued,  $A$ , the amount invested,  $P$  and the number of years,  $n$  are known, using the formula:

$$R = \sqrt[n]{\frac{A}{P}} - 1$$

### Answers

Answers to the exercises are given on a separate spreadsheet.