

# QCA Unit 6B

ICT  
Year 6

## Spreadsheet modelling

### About the unit

In this unit children learn to use a spreadsheet to explore a mathematical model.

Children will be taught to use formulae in spreadsheets to answer 'what if ...?' questions. They will explore how changes in a spreadsheet affect results and identify simple rules.

Children will apply what they have learned in this unit when exploring mathematical and scientific models.

### Where the unit fits in

This unit builds on Unit 5D 'Introduction to spreadsheets'.

This unit assumes that children:

- can calculate total costs
- can recognise number patterns
- know the formula for the area of a rectangle.

### Technical vocabulary

- spreadsheet
- cell
- formula
- calculate
- data
- model

### Resources

- spreadsheet software
- a variety of receipts

### Expectations

At the end of this unit

**most children will:** explore the effects of changing data in a spreadsheet

**some children will not have made so much progress and will:** use a spreadsheet to calculate totals

**some children will have progressed further and will:** explore the effects of changing data in a spreadsheet; make predictions and use a spreadsheet to test them.

| Learning objectives   | Possible teaching activities  | Learning outcomes   | Points to note   |
|---|---|---|--|
| Children should learn:  |   | Children:   |  |
| <p><b>Setting the scene</b></p> <ul style="list-style-type: none"> <li>• <b>key idea:</b> that mathematical models can be explored using a spreadsheet</li> </ul> | <ul style="list-style-type: none"> <li>• Remind the children about their earlier work with spreadsheets and discuss mathematical investigations they have carried out. Tell them they are going to use a spreadsheet to explore a mathematical problem.</li> </ul>  | <ul style="list-style-type: none"> <li>• understand that spreadsheets can be used to explore mathematical models</li> </ul>   |  |
| <p><b>Short focused tasks</b></p>   |   |   |  |
| <ul style="list-style-type: none"> <li>• <b>technique:</b> to identify formulae and enter them into a spreadsheet</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Remind children how to enter a formula into a spreadsheet, such as '=c2/c3'. Ask the children to identify the formulae they would need to enter to calculate: <ul style="list-style-type: none"> <li>– the area of a rectangle</li> <li>– the perimeter of a rectangle.</li> </ul> </li> <li>• Ask the children to set up a spreadsheet to work out the area and perimeter of a rectangle. The length and width of the rectangle should appear so that the values can be changed.</li> <li>• Ask the children to explore what happens when the data in the two cells are changed.</li> </ul> | <ul style="list-style-type: none"> <li>• identify and enter the correct formulae into cells, modify the data, make predictions of changes and check them</li> </ul> | <p>Children who find the work difficult could be given a prompt sheet showing cell references.</p> <p>More able children could try more complex formulae such as '=2*(10-c2)' to find the lowest values.</p> |

| Learning objectives  | Possible teaching activities   | Learning outcomes   | Points to note   |                     |   |   |   |   |   |   |   |  |
|--|--|---|--|---------------------|---|---|---|---|---|---|---|--|
| Children should learn:   |  | Children:   |  |                     |   |   |   |   |   |   |   |  |
| <b>Setting the scene</b>   | <ul style="list-style-type: none"> <li>• <b>technique:</b> to copy cells</li> <li>• Show the class how to copy formulae from one cell to another. Ask the children to create a set of multiplication tables such as: <table border="1" data-bbox="622 1008 726 1657"> <thead> <tr> <th>number A</th> <th>number B</th> <th>number A x number B</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>1</td> <td>4</td> </tr> <tr> <td>4</td> <td>2</td> <td>8</td> </tr> </tbody> </table> </li> </ul> <p>The spreadsheet should extend number B to 12. Ask the children to investigate changing number A.</p> | number A  | number B   | number A x number B | 4 | 1 | 4 | 4 | 2 | 8 | <ul style="list-style-type: none"> <li>• copy formulae to create tables of results</li> </ul> | Children could be shown how to use and copy a formula such as '=C3+1' to produce a second column of figures. |
| number A   | number B   | number A x number B   |  |                     |   |   |   |   |   |   |   |  |
| 4  | 1  | 4   |  |                     |   |   |   |   |   |   |   |  |
| 4  | 2  | 8   |  |                     |   |   |   |   |   |   |   |  |
| <ul style="list-style-type: none"> <li>• <b>technique:</b> to use a spreadsheet to draw a graph</li> </ul> | <ul style="list-style-type: none"> <li>• Show the class how to create graphs using the spreadsheet. Ask the children to investigate graphs such as <math>y = x^2</math>, <math>y = 2x</math>, <math>y = x + 3</math>.</li> </ul>   | <ul style="list-style-type: none"> <li>• create graphs</li> </ul>   |  |                     |   |   |   |   |   |   |   |  |
| <b>Integrated task</b>   | <ul style="list-style-type: none"> <li>• Ask the children to use a spreadsheet model to find out the maximum area that can be included in a rectangular field of fixed perimeter. Ask them to set up formulae in a spreadsheet and to try whole numbers for one side first. Ask them to look at a graph of the areas to see where the maximum point is.</li> </ul>   | <ul style="list-style-type: none"> <li>• create and use a spreadsheet to identify an optimum shape</li> </ul> | Children may guess that the answer is a square, but they should be encouraged to list their predictions using the spreadsheet model.<br>More able children could be given a perimeter which produces side lengths which are not whole numbers. |                     |   |   |   |   |   |   |   |  |