

## Programming Activity 2

### Calculate the surface area of a cuboid

(Unit 1 Problem solving: pages 12–23)

#### Learning objectives

- Understand how to create an algorithm to solve a particular problem
- Make use of programming constructs (sequence, selection and iteration) and use appropriate conventions (flowchart, pseudocode, written description, draft program code)

#### Assessment objectives

AO2, AO3

#### Spec alignment

Page 12, Sections 2.3.1, 2.3.4, 2.4.1

#### Task

Write a pseudocode program to calculate the surface area of a cuboid.

#### Misconceptions/barriers

This task requires the use of mathematical knowledge and computing knowledge. You may need to remind students how to calculate the surface area of a cuboid. A drawing showing a cuboid on the board labelled with suitable measurements may help.

#### Differentiation

Low ability:

- Initially ask students to write the pseudocode to calculate just the area of a rectangle.
- Then using a diagram you can discuss what other measurement you would need (depth) and how you would need to calculate the surface area of the front face, the side face and the top face.
- Before writing the pseudocode, some students may find it beneficial to create a flowchart showing the calculation.

High ability:

- Ask students to implement their pseudocode solution to the task in the programming language they are doing.
- After completing this they can discuss with a partner what changes they had to make and why they needed to make them.
- Ask students to expand the program to calculate the surface area of other shapes, such as a sphere.