

## Plan and Cost a Garden Bed

**Subject(s)** Mathematics, Design Technology

**Year(s)** 8-9

### Learning Intention(s)

Students will apply their knowledge of area, perimeter, volume and cost calculations to design a productive garden bed. They will use mathematical reasoning to optimise space and budget while considering practical gardening constraints.

### Links to Curriculum

#### Strands

- Mathematics - Numbers
- Design Technology – Information and Communications

#### Sub strands

##### Mathematics

- 8.2 Length and Perimeter
- 8.5 and 9.5 Rates and ratios
- 9.2 Measurement
- 9.6 Consumer Maths

##### Design Technology

- 8.1 and 9.1 Design Process

### Learning outcomes

#### Mathematics

- 8.2.12.2 Calculate the perimeter of any circles using correct formula
- 8.5.1 Understand what ratio is and how it is used to compare quantities and look at the relationships between quantities.
- 9.2.24 Know how to calculate the capacity of various objects, shapes and items.
- 9.5.8.1 Convert units of various rates from one unit to another
- 9.6.2.1 Calculate and compare costs of goods and services to determine the best buy (cheaper goods with higher quality)

#### Design Technology

- 8.1.2 and 9.1.2 Apply the design process to solve a real-life situation

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## Teaching Activity

### Materials

This activity is centred on planning so materials are not required. However, if the designs are to be implemented, the materials would be determined by student planning, and are likely to include:

- Construction materials (e.g. logs, bricks, tyres)
- Soil, compost and potting mix
- Seeds
- Fencing (if required)

### Task Description for Students

You have been given a space in the school garden to design a vegetable garden bed. Your goal is to create a functional and cost-effective design while considering space, soil requirements, and budget constraints.

### Student Instructions

#### Step 1: Choosing the Shape of Your Garden Bed

**Select** a shape for your garden bed:

- rectangle
- square
- triangle
- circle

**Calculate** the **area** and **perimeter** of your chosen shape. When planning the shape and size, consider how you would reach into the middle of the garden bed. Plan for a garden that is less than 6 square metres in size.

#### Step 2: Determining Soil Volume

Your garden bed will need **30cm of soil depth**.

**Calculate** the volume of soil required.

- Example: If soil is sold in bags of 50 litres for \$25 each, determine how many bags are needed and the total cost.

### Step 3: Selecting Plants

Choose three different types of vegetables to grow.

- **Research** the recommended spacing for each plant (e.g. 30cm apart).
- **Calculate** how many plants of each type can fit in your garden bed.

### Optional Step: Fencing the Garden Bed

If you want to fence your garden bed:

- Calculate the total length of fencing needed based on the perimeter.
- Example: If fencing costs \$12 per metre, determine the total fencing cost.



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### Reflection

**Write** a short paragraph explaining your design choices. Consider:

- Why you chose a particular shape
- How you optimised space and cost
- Any challenges or improvements for your design

### Assessment Criteria

- ✓ Accurate calculations of area, perimeter, and volume.
- ✓ Correct budgeting and cost analysis.
- ✓ Logical and realistic plant spacing.
- ✓ Clear and well-reasoned reflection.