

## Level 5

# Victorian Houses

### OVERVIEW

Topic or Theme: **The Victorians**

Pupils use their understanding of scale, area and perimeter to compare and contrast the furniture and layout of a Victorian labourer’s house and a Victorian landlord’s house.

#### Knowledge and Understanding of Measures

- Pupils can:
- convert from one metric unit to another;
  - calculate the areas of squares, rectangles and right angled triangles;
  - calculate perimeters of a range of shapes; and
  - understand and use scale in the context of simple maps and drawings.

#### Requirements for Using Mathematics

- Pupils can:
- plan and decide how an activity might be approached;
  - identify and use efficiently the materials, equipment, mathematics and strategies required;
  - use a range of appropriate mathematical techniques and notation;
  - plan and work systematically and efficiently;
  - use a range of problem-solving strategies, suggesting and trying out different approaches when difficulties arise; and
  - use appropriate mathematical language to express and communicate ideas accurately.

#### Connected Learning

- Pupils:
- **Managing Information**
    - plan, set goals and select the most appropriate methods to complete Part 2 of the task;
  - **Thinking, Problem-Solving and Decision-Making**
    - try alternative problem-solving solutions and approaches by being willing to suggest amendments and/or improvements to their original plan;
  - **Being Creative**
    - make their ideas and solutions real by experimenting with different designs, actions and outcomes to satisfy the design brief; and
  - **Communication: Talking and Listening**
    - communicate detailed information clearly, using precise vocabulary for measurement, scale and formulae.

## Level 5

# Victorian Houses

## PLANNING

Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

- Pupils can calculate the area of a square, a rectangle and a right angled triangle.
- Pupils can calculate the perimeter of a range of shapes.
- Pupils can convert metric measurements of length and have experience of using basic scale.
- Pupils also have experience of maps drawn from a plan view.
- For the cross-curricular and historical aspects of this activity, pupils have a basic understanding of the hierarchy in a typical Victorian countryside population (for example landlord, strong farmer, small farmer, and labourer) and how each person's role affected their living and working conditions.

### Learning Objectives

Pupils:

- calculate the area of a square, rectangle and right angled triangle;
- calculate the perimeter of simple shapes, initially with all lengths given;
- record length measurements using decimal notation, and discuss how this relates to place value, for example  $14 \text{ mm} = 1.4 \text{ cm}$ ,  $140 \text{ cm} = 1.4 \text{ m}$ ; and
- solve problems and carry out investigations on length using mental calculation strategies, a pencil and paper, or a calculator.

### What You Need

#### Part 1

- **Resource 18: Victorian Labourer's One-Roomed Cottage**

#### Part 2

- **Resource 19: Drawing Room in the Big House**
- ruler
- range of paper types – lined, blank, squared and graph paper

#### Part 3

- **Resource 18** and **Resource 19**



## Level 5

# Victorian Houses

### ACTIVITY

#### Process

#### Evidence of Learning

(Observation, Assessment and Evaluation Opportunities)

#### Part 1

- Using appropriate images, remind your pupils of the main features of a plan drawing, for example 'We often use a scale and key to show the area from above'.

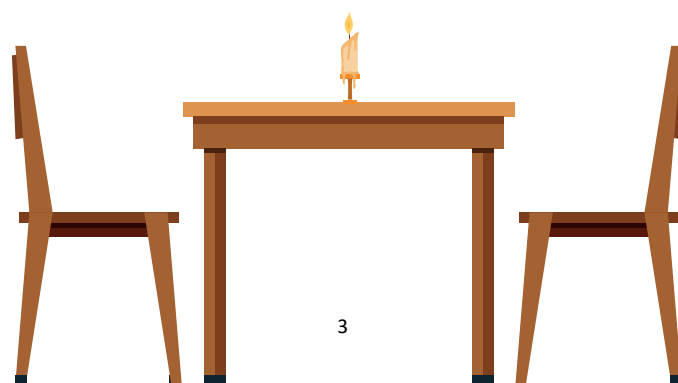
- Provide each pupil with a copy of **Resource 18**. Engage your pupils in a shared session to revise the following:
  - scale;
  - measuring accurately; and
  - finding the area and perimeter of shapes – plan size and actual size.

Use questions and a method such as:

- On the plan drawing, what are the dimensions of the cottage?
- On the plan drawing, what is the area of the cottage floor?
- What would be the actual dimensions of the cottage, if the scale is 4 cm = 1 m?
- What would the actual area of the cottage floor be?
- What would the actual perimeter of the cottage floor be?

**Support pupils by modelling how to present their working out for each part of the problem. Allow pupils to decide how to complete each calculation – using mental calculation strategies, a pencil and paper, or a calculator, and discuss the efficiency and effectiveness of each approach.**

- Assess pupils' responses and justifications of their choices



## Level 5

# Victorian Houses

### ACTIVITY (Continued)

#### Process

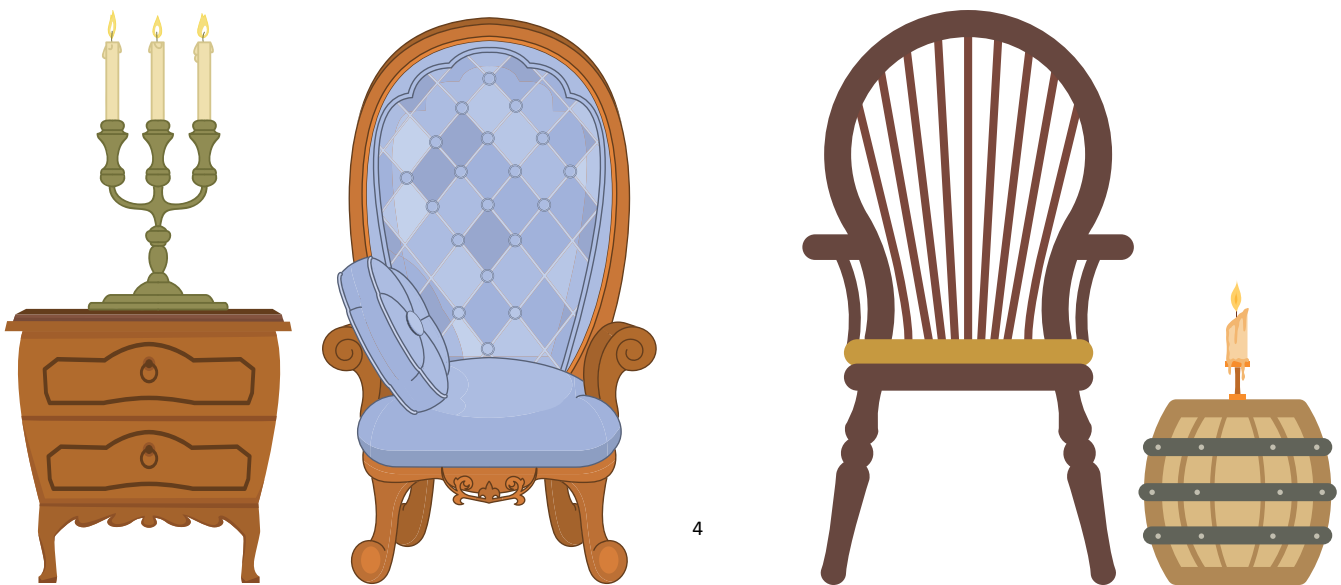
##### Part 2

- Arrange pupils into pairs and give each pair a copy of **Resource 19**. Read and discuss the activity. Use key questions to probe the pupils' initial thinking, for example:
  - What is the activity asking you to do?
  - What information do you already know?
  - What information do you need to find out?
  - What equipment might you need to carry out this task?
  - How might you complete the activity?
  - How could you work effectively with your partner?
- Give pupils 10 minutes to start the activity. Ensure they have access to all the equipment they might require. Circulate around the class to observe, and to probe and try to refine pupils' initial ideas.

#### Evidence of Learning

(Observation, Assessment and Evaluation Opportunities)

- Assess pupils' responses and initial thinking and planning
- Observe pupils' interaction and how they listen to the discussion



## Level 5

# Victorian Houses

### ACTIVITY (Continued)

#### Process

- Discuss how each pair has decided to do the task. Use the key questions to help pupils assess their progress:
    - What information do you already know?
    - What information have you started to find out?
    - What equipment have you collected so far to carry out this task?
    - How are you planning to complete the activity? and/or
    - How are you going to work effectively with your partner?
- Compare the different approaches pupils are using, asking questions such as:
- Have you heard any ideas that you are going to use? Are you going to change your plan in any way?
  - What will be the most efficient way of carrying out this activity?

**Use questioning to scaffold pupils' thinking and refine their approach to this task. Advise pupils to use squared paper and a 30 cm ruler. Guide them to ensure that their scale is appropriate and easy to use, for example 2 cm = 1 m or 4 cm = 1 m. Suggest that each pupil works out the dimensions, area or perimeter of half of the pieces of furniture, and then exchanges this working out with their partner's working out, to check it.**

#### Evidence of Learning

(Observation, Assessment and Evaluation Opportunities)

- Assess pupils' approach to the task
- Use effective questioning to help pupils refine their approach to the task

## Level 5

# Victorian Houses

### ACTIVITY (Continued)

#### Process

- Allow pupils to work with their partners to complete the activity.  
**Circulate around the class, supporting pupils where necessary, particularly with the scale element of the activity. However, do not give pupils the solutions, but rather use the key questions below to encourage pupils to think independently and to try to find alternative solutions to their problems.**
  - What have you done so far?
  - What could you do to solve this problem?
  - What is the formula for finding the area or perimeter of...?
  - What do you already know that could help you?

- After completing the activity, allow pupils to compare their plan drawing with another pair's drawing. Ask pupils questions such as:
  - How is the other pair's drawing room similar or different to yours?
  - Did they draw the measurements to scale?

#### Part 3

- Invite pupils to compare and contrast orally each plan drawing, for example contrasting the floor area of the labourer's cottage with the floor area of the drawing room in the big house.
- Invite your pupils to discuss how social status affected living conditions during the Victorian era.

#### Evidence of Learning

(Observation, Assessment and Evaluation Opportunities)

- Observe pupils' interaction and the type of teacher support they require
- Assess pupils' measuring skills and how they use a simple scale

- Assess how pupils use mathematical language when they compare and contrast living conditions

- **Pupil Self-Evaluation**  
Pupils use the following sentence starters to evaluate their own work in these tasks:
  - What I found difficult was...
  - What really made me think was...
  - What helped me when something got tricky was...

## Level 5

# Victorian Houses

### PROGRESSION

#### Within Level 5

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#### Requirements for Using Mathematics

Pupils can:

- plan and decide how an activity might be approached;
- identify and use efficiently the materials, equipment, mathematics and strategies required;
- use a range of appropriate mathematical techniques and notation;
- plan and work systematically and efficiently;
- use a range of problem-solving strategies, suggesting and trying out different approaches when difficulties arise; and
- use appropriate mathematical language to express and communicate ideas accurately.

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#### For pupils to progress within Level 5 towards solid achievement at Level 5, they should develop the following knowledge, understanding and skills:

- converting from one metric unit to another;
- understanding and using scale in the context of simple maps and drawings; and
- calculating the area of squares, rectangles and right angled triangles.

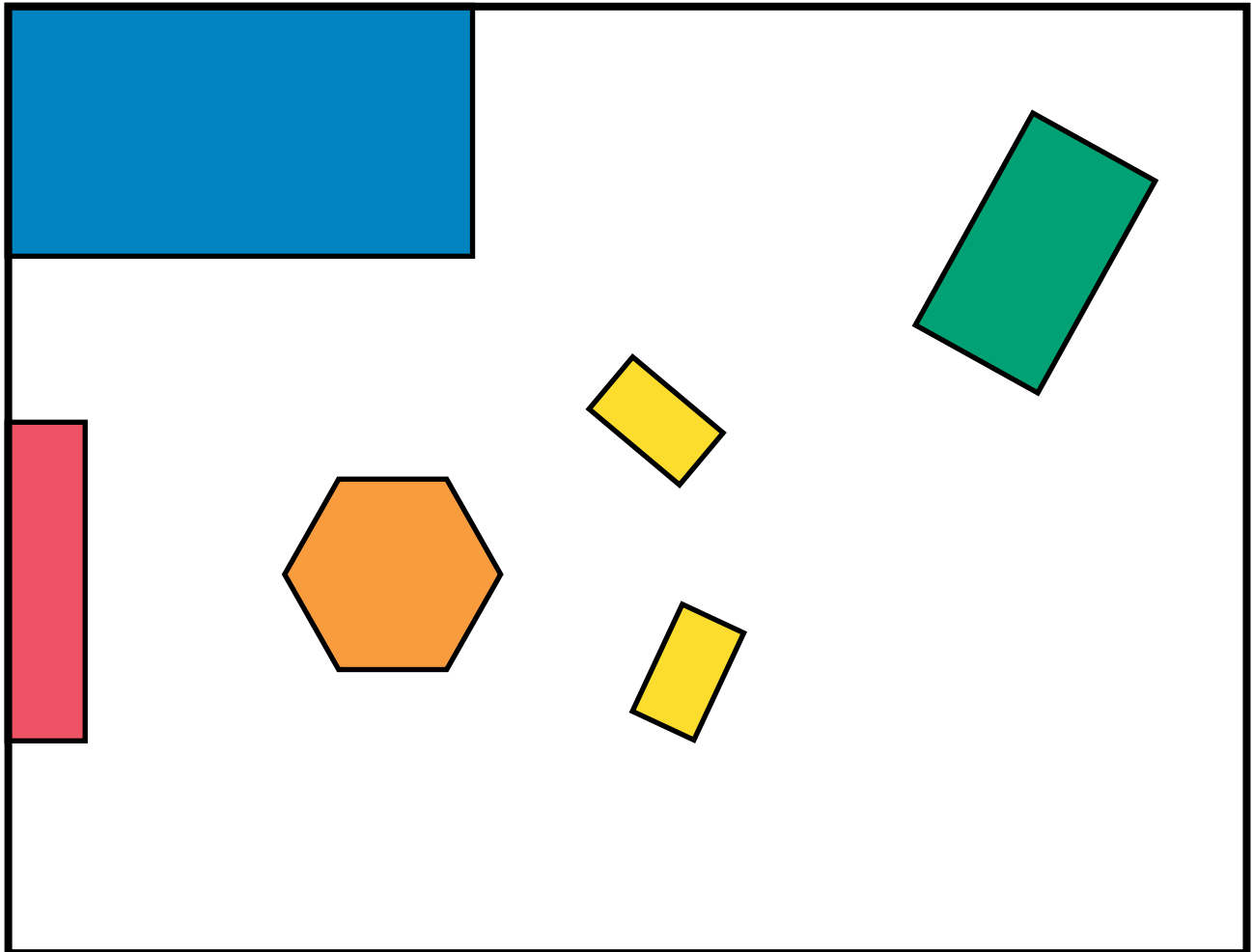
#### Extension Opportunities

Identify opportunities to further develop pupils' knowledge and understanding of Measures within Level 5, or to challenge gifted and talented pupils.

For example, invite your pupils to use two maps of Belfast, one printed during the Victorian period and one modern map, to discuss how Belfast developed as a city during the Victorian period and to compare it to modern-day Belfast. Ask pupils to:

- measure distances on the map in centimetres and millimetres and convert each set of measurements to the other units;
  - use the map scale to establish actual distances between major landmarks; and
  - compare the land area of Belfast in the Victorian period and in modern times.
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# Victorian Labourer's One-Roomed Cottage



bed



wooden box for cot



stool



basket for potatoes



fireplace



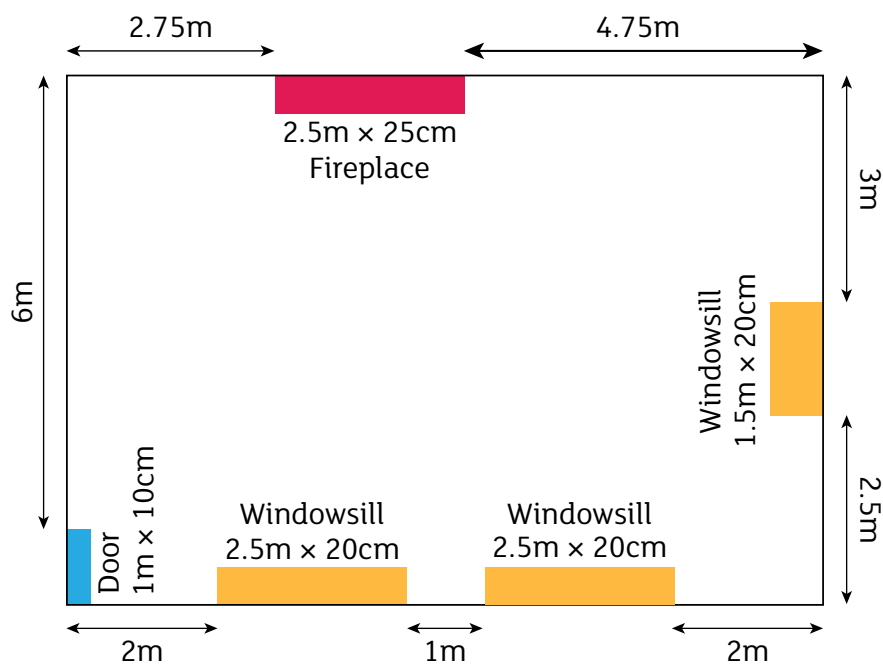
4 cm = 1 m



# Drawing Room in the Big House

I would like to rearrange the furniture in my drawing room, as my husband has brought back some new and interesting pieces from his travels.

My butler has drawn a quick outline of the room and made some notes about each piece of furniture, and I would like you to make a plan drawing to ensure that all the furniture will fit comfortably into the room.



**2 sofas** – These are rectangular in shape and congruent in size. Each covers a floor area of  $2.5 \text{ m}^2$ .

**2 chairs** – Each chair is a different shape. However, they both have the same perimeter of 4 m.

**large table** – Behind one of the sofas should be a large rectangular table measuring 2.5 m by 50 cm.

**dining table** – This is for afternoon tea. It is an irregular octagon shaped table, although it is still symmetrical. It has a perimeter of 6 m.

**4 dining chairs** – These are square in shape and are part of a set. Each chair covers a floor area of  $50 \text{ cm}^2$ .

**2 sideboards** – These are also an odd shape – I think the correct name for the shape is an isosceles right angled triangle. The sideboards are a matching pair. The side of each sideboard measures 1 m.

**mirror** – When viewed from above, the mirror looks rectangular in shape. It has a perimeter of 6.4 m and protrudes 20 cm from the wall.