

Teacher Notes

Introduction

Pupils can work on this problem individually or with others.

- They can discuss how they will use the information provided to work out how much it will cost to paint and decorate the room.
- They can share their responses and compare approaches.

This problem deals with a pupil's ability to read through information to identify and use the detail they need to calculate areas to obtain costs.

What I know (think)

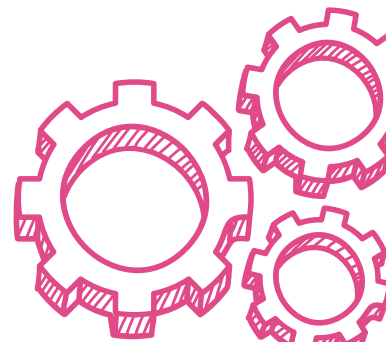
The pupils should know from the given problem:

- A painter and decorator has been asked to price a painting contract.
- There is a room with dimensions given for the walls, ceiling, door, chimney breast and windows.
- The customer has chosen paint for the walls and different paint for the ceiling.
- The paint covers approximately 10 m^2 per litre.
- The walls and ceiling require two coats of paint.
- The painter and decorator thinks that it will take 1.5 days to paint and she charges £90 per day.
- They need to work out how much the contract will cost.

What I need to know (identify)

Pupils need to identify:

- the areas of the walls, ceiling, door, chimney breast and windows;
- how much area of the walls require paint, excluding the door, chimney breast and windows;
- how much area of the ceiling requires paint, excluding the chimney breast;
- how many tins will be required to paint the walls and their total cost;
- how many tins will be required to paint the ceiling and their total cost; and
- the total cost of the walls, ceiling and labour.



Painting and Decorating (Continued)

What I need to do (employ)

First, pupils should use the information provided to calculate the area of the walls that require painting, carrying out the following:

- Using the dimensions of the room, pupils should calculate the area of the walls using multiplication:
 - two rectangles measuring 4.5 m by 2.4 m; and
 - two rectangles measuring 4 m by 2.4 m.
- They then add together the areas of all four walls.
- They convert the dimensions given in millimetres to metres to help with area calculations by dividing the millimetres by 1000 to get metres.
- They calculate the rectangular areas of the doorway, chimney breast and windows using multiplication: the doorway measures 0.9 m by 2.1 m, the chimney breast measures 1.2 m by 2.4 m, and the windows measure 0.9 m by 1.45 m ($\times 2$).
- They add together the areas of the doorway, chimney breast and windows and subtract this from the total area of all four walls.

Second, they should work out how many tins of paint they need for the walls:

- If one litre covers 10 m, they should then divide the area of the walls that requires paint by 10 to find out how many litres are needed.
- They should use the options of paint (5 litre and 2.5 litre) to find the cheapest combination of tins that will be needed, and add up the associated costs.

Third, they should calculate the area of the ceiling that requires painted:

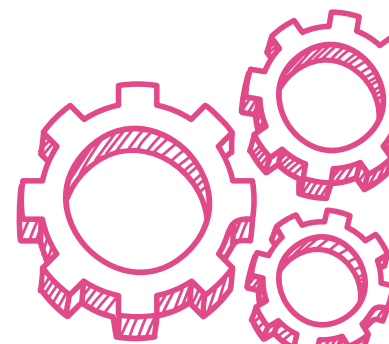
- They should calculate the area of the ceiling by multiplying its dimensions: a rectangle measuring 4.5 m by 4 m.
- The chimney breast will cover a part of the ceiling, so they need to subtract its area from the area of the ceiling. The chimney breast is a rectangle measuring 1.2 m by 0.6 m, which pupils must multiply to find its area.

Fourth, they should work out how many tins of paint they need for the ceiling:

- If one litre covers 10 m, they need to divide the area of the ceiling that requires paint by 10 to find out how many litres are needed.
- They should use the options of paint (2.5 litre and one litre) to find the cheapest combination of tins that will be needed, and add up the associated costs.

Fifth, they should work out the total cost of the contract:

- They need to calculate the cost of labour by multiplying the number of days by £90.
- They then add up the cost of the paint for the walls, paint for the ceiling, and the labour.

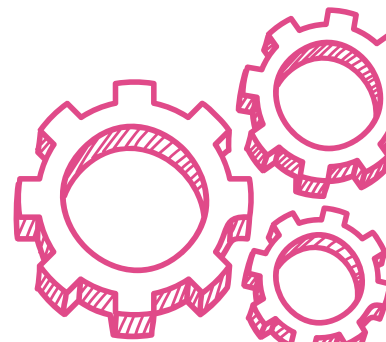


Painting and Decorating (Continued)

What I did (review)

Pupils will use self-assessment, peer assessment or teacher feedback to decide whether they have approached the problem as intended.

- Did they correctly use the given dimensions to work out the area of all the walls, the door, the chimney breast and the ceiling?
- Did they convert millimetres into metres (or vice versa, depending on approach)?
- Did they figure out that they had to subtract the areas of the door, chimney breast and windows when working out the area of walls and ceiling that require paint?
- Did they effectively multiply, divide, add and subtract using decimals?
- Did they work out how many tins were needed and decide on the cheapest suitable combination?
- Did they add up all the associated costs to find the overall cost of the contract?



Painting and Decorating (Continued)

Curriculum Objectives

This problem should enable pupils to demonstrate their knowledge, understanding and skills through:

Developing pupils as Contributors to Economy and the Environment

Apply mathematical skills in everyday financial planning and decision making:

- Pupils will show how they used their understanding of dimensions, metric units and area to work out how much it would cost to paint a room.

Thinking Skills and Personal Capabilities

This problem can provide an opportunity for pupils to demonstrate a variety of the following Thinking Skills and Personal Capabilities:

Managing Information	<ul style="list-style-type: none"> • Plan and set goals and break a task into sub-tasks
Thinking, Problem-Solving and Decision Making	<ul style="list-style-type: none"> • Examine options and weigh up pros and cons • Generate possible solutions, try out alternative approaches and evaluate outcomes
Being Creative	<ul style="list-style-type: none"> • Seek out questions to explore and problems to solve • Experiment with ideas and questions • Make ideas real by experimenting with different designs, actions and outcomes
Working with Others	<ul style="list-style-type: none"> • Listen actively and share opinions • Suggest ways of improving their approach to working collaboratively
Self-Management	<ul style="list-style-type: none"> • Seek advice when necessary • Organise and plan how to go about a task • Focus, sustain attention and persist with tasks

Cross-Curricular Skills

This problem should enable pupils to demonstrate a variety of the following Cross-Curriculum Skills:



Using Mathematics

