

## Teacher Notes

### Introduction

Pupils can work on this problem individually or with others.

- They can discuss how to break the problem into manageable steps to help them to work out the area of the apartment, the area of the extension, and the percentage of extra floor space the extension provides.
- They can share their responses and compare approaches.

This problem deals with a pupil's ability to calculate areas and compare areas using percentages.

### What I know (think)

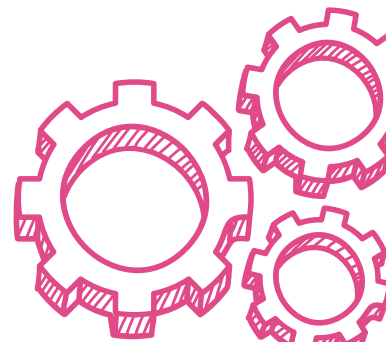
The pupils should know from the given problem:

- Aileen is considering extending her apartment by adding a dining room and utility room.
- She wants the extension to add at least 15% to the existing floor space.
- There is a diagram outlining the plan of the existing apartment and the extension.
- The dimensions in the plan are given in metres.
- They need to find out if building the extension will be worthwhile.

### What I need to know (identify)

Pupils need to identify:

- the area of the existing floor space of the apartment;
- the area of the extension; and
- whether the area of the extension is greater than 15% of the area of the existing floor space.



# Building an Extension (Continued)

## What I need to do (employ)

First, pupils should use the information provided to work out what the area of the existing floor space is:

- Pupils use the dimensions given for the separate rooms to calculate the width and length of the apartment.
- By adding the widths of the bathroom (1.5 m) and kitchen (4.9 m) together, or the widths of the bedroom (3.4 m) and living room (3.0 m) together, pupils will be able to find the width of the apartment (6.4 m).
- By adding the lengths of the kitchen (2.1 m) and living room (5.0 m) together pupils will be able to find the length of the apartment (7.1 m).
- Pupils multiply the apartment's width (6.4 m) by its length (7.1 m) to get the area of the apartment ( $45.44 \text{ m}^2$ ).

Second, they should work out the area of the extension:

- By adding the widths of the utility room (1.8 m) and dining room (3.0 m) together pupils will be able to find the width of the extension (4.8 m).
- Pupils multiply the extension's width (4.8 m) by its length (2.7 m) to get the area of the extension ( $12.96 \text{ m}^2$ ).

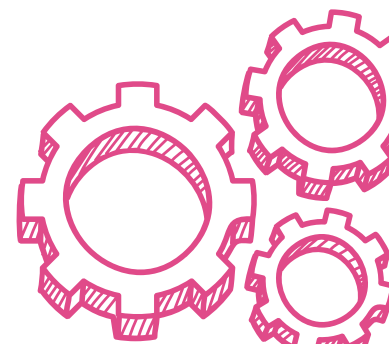
Third, they check to see if the area of the extension is bigger than 15% of the area of the apartment. Pupils can do this in a couple of ways:

- They could calculate 15% of the area of the apartment and see if this is bigger or smaller than the area of the extension.
- Alternatively, they could divide the area of the extension by the area of the apartment and multiply by 100 to calculate the area of the extension as a percentage of the area of the existing floor space.

## 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 calculate the area of the apartment by identifying the total width and total length?
- Did they correctly calculate the area of the extension?
- Did they find 15% of the area of the apartment and compare it to the area of the extension?
- Did they calculate the area of the extension as a percentage of the area of the existing floor space?



# Building an Extension (Continued)

## Curriculum Objectives

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

Developing pupils as individuals

Demonstrate an ability and willingness to develop logical arguments

- Pupils use their calculations for the area of the apartment and the area of the extension along with their percentage calculations to determine if the extension is worthwhile.

## 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

- Plan and set goals and break a task into sub-tasks

Thinking, Problem-Solving and Decision Making

- Generate possible solutions, try out alternative approaches and evaluate outcomes

Being Creative

- Experiment with ideas and questions
- Learn from and value other people's ideas

Working with Others

- Listen actively and share opinions
- Suggest ways of improving their approach to working collaboratively

Self-Management

- Seek advice when necessary
- Organise and plan how to go about a task

## Cross-Curricular Skills

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



Using Mathematics

