

Teacher Notes

Introduction

Pupils can work on this problem individually or with others.

- They can discuss how to break the problem into manageable steps by:
 - converting feet and inches to metres and centimetres to help them work out the area of the apartment;
 - working out how to calculate the cost per square metre for the apartment; and
 - looking at any possible options Andy might have that would enable him to afford the apartment.
- They can share their responses and compare approaches.

This problem deals with a pupil's ability to convert imperial units to metric units, calculate areas, find associated costs based on given information, and provide logical suggestions.

What I know (think)

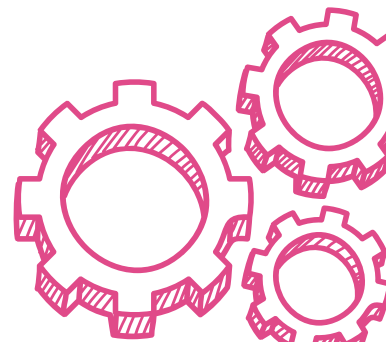
The pupils should know from the given problem:

- The price of a new build apartment in and around Belfast differs, depending on whether it is inside or outside Belfast city centre.
- The costs given for the price per square metre of the two locations are different.
- Andy has a new job with a salary of £24 000, and he would like to live in the city.
- New one bedroom apartments are being built inside and outside Belfast, and Andy would like to buy one.
- Andy can get a mortgage of three times his salary, and has a £22 000 deposit.
- There is a plan of the apartment with dimensions given in feet and inches.
- One foot = 30 cm
- Andy wants to know if and where he can buy the apartment based on location, size and salary.

What I need to know (identify)

Pupils need to identify:

- what Andy can afford based on the bank mortgage and his savings;
- how to convert the imperial units into metric units;
- what the total area of the apartment is in square metres;
- how much the apartment would cost based on **location** (inside and outside Belfast city centre) and whether Andy can afford the apartment or not;
- what Andy can afford inside and outside Belfast, based on the **size** of the apartment;
- what **salary** Andy would need to be paid to be able to afford what he wants; and
- what advice they would give Andy.



Buying a New Apartment (Continued)

What I need to do (employ)

Pupils may approach the problem in a different order than is described here: this is fine as long as their steps allow them to find the information they need to provide suitable advice.

First, pupils work out how much Andy can afford to spend on an apartment:

- They multiply Andy's salary by three to work out the bank mortgage.
- They then add the mortgage value to the savings.

Second, pupils use the dimensions in the plan to calculate the area of the apartment:

- They work out how wide and long the apartment is in feet and inches.
- They use the conversion of 1 foot = 30 cm to convert the width and length into cm and then metres.

Third, pupils determine whether Andy can afford the new apartment depending on **location** by using the price per square metres in the table:

- They calculate how much it would cost for the apartment in Belfast city centre, and then calculate the shortfall.
- They then calculate how much it would cost for the apartment outside Belfast city centre, and how much extra money Andy would have.

Fourth, pupils calculate the **size** of apartment that Andy could afford inside and outside Belfast:

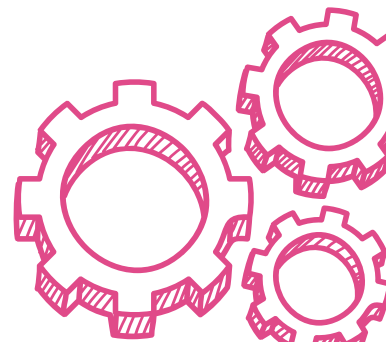
- They divide what Andy can afford by the price per square metre for inside Belfast and then outside Belfast to find the areas of both possible apartments.
- They round the area appropriately – rounding up would not be appropriate as this would increase the area of the apartment and therefore be more than what Andy can afford.

Fifth, pupils calculate what **salary** Andy would need to be paid so that he could live in Belfast city centre, which is what he would prefer but can't afford:

- They subtract Andy's savings from the cost of the apartment inside Belfast city centre.
- They then divide that value by three (mortgage is three times his salary).
- They subtract Andy's salary from the answer to calculate how much more he needs to be paid.

Finally, pupils provide suggestions for Andy based on all their calculations:

- what he can and cannot afford;
- where he can afford to buy the apartment;
- what size of apartment he can afford;
- what he would need to earn to afford the apartment he prefers; and
- any other suggestions based on their own interpretation of the problem.

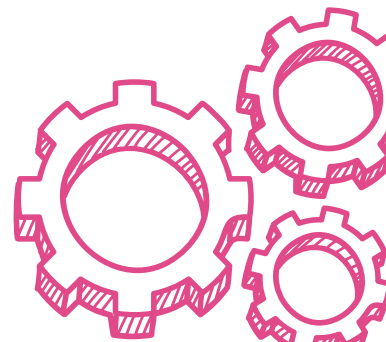


Buying a New Apartment (Continued)

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 calculate the maximum amount Andy can afford?
- Did they convert imperial units to metric?
- Did they calculate how much it would cost to buy the apartment inside and outside Belfast and determine which Andy can afford? (**location**)
- Did they calculate the biggest apartment area Andy can afford inside and outside Belfast? (**size**)
- Did they calculate how much Andy would need to be paid to afford the apartment inside Belfast? (**salary**)
- Did they provide appropriate advice for Andy, based on their work and information available?



Buying a New Apartment (Continued)

Curriculum Objectives

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

Developing pupils as individuals	<p>Demonstrate an ability and willingness to develop logical arguments</p> <ul style="list-style-type: none"> Pupils will draw on their work and the information provided to suggest suitable advice for Andy.
Developing pupils as Contributors to Economy and the Environment	<p>Apply mathematical skills in everyday financial planning and decision making:</p> <ul style="list-style-type: none"> Pupils will demonstrate how to make appropriate financial decisions based on what Andy wants and what he can afford.

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 Communicate with a sense of audience and purpose
Thinking, Problem-Solving and Decision Making	<ul style="list-style-type: none"> Justify methods, opinions and conclusions 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"> Make new connections between ideas/information Challenge the routine method Take risks for learning
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 Review learning and some aspect that might be improved 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

