



Maths

in the home

Paul Steenson

© Blake Publishing

This Edition is for sale in the United Kingdom only

Copyright © Axis Education 2009

The worksheets may be produced for use at one site within the purchasing institution for educational use only without permission from the Publisher, providing that the work has been paid for.

Otherwise, no part of this publication may be photocopied, recorded, or otherwise reproduced, stored in a retrieval system or transmitted in any form or by any electronic or mechanical means without prior permission of the copyright owner.

Work sent on approval or inspection and not yet paid for may not be copied under any circumstances.

ISBN 978-1-84618-187-0

Axis Education

PO Box 459

Shrewsbury SY4 4WZ

Email: enquiries@axiseducation.co.uk

www.axiseducation.co.uk

Contents

Worksheet	Title	Page
1	Using electrical power	5
2	Paying the gas bill	7
3	Appliances and energy use	9
4	Appliances and water use	11
5	Using floor plans	13
6	Tiling a floor	16
7	Painting a room	19
8	Furnishing a flat	22
9	A courtyard garden	25
10	Land area	28
11	Council tax	31
12	On the net	33
13	Household budgets	35
14	What time is it?	37
15	Taking medicines	40
16	Running a car – petrol consumption and cost	43
17	Owning a car	46
18	Breakfast	48
19	In the kitchen	51
20	Take-away food	54
21	Going shopping	57
22	Best buy or deal	59
23	Sportymart Sun and Surf brochure	61
24	Sports sale	63
25	Building a shed	65
	Teacher's notes	68
	Answers	71

Using electrical power

If you take a close look at most electrical appliances, you will find a number followed by a capital W. This tells you how much electricity (measured in watts) the appliance will use in one hour. Electricity use is measured in kilowatt hours (kWh). 1 kWh is 1000 watts supplied for one hour. For example, a dishwasher marked 1100 W will use 1100 watts when operated for one hour, which is the equivalent to 1.1 kWh.

1. For each of these appliances, find the number of hours it will take to use 1 kWh of electricity. (Answer in hours, correct to 1 decimal place.)

a) a hairdryer – 1000 W

b) an electric kettle – 500 W

c) a microwave oven – 850 W

d) a vacuum cleaner – 1400 W

2. A lamp has a 40 W bulb. For how many hours can it be kept alight on 1 kWh of electricity?

3. a) Find the number of hours for which a 100 W light bulb can be kept alight on 1 kWh of electricity.

b) If electricity costs 12 pence per kWh, what does it cost to keep this light bulb on for five hours?

4. a) Find the number of hours for which a 75 W light bulb can be kept alight on 1 kWh of electricity. (Answer correct to 1 decimal place.)

b) If electricity costs 12 pence per kWh, what does it cost to keep this light bulb on for eight hours?

5. To save energy, people are encouraged to use compact fluorescent (energy saver) light bulbs. A 15 W energy saver bulb is recommended in place of a standard 75 W light bulb.

a) Find the number of hours for which a 15 W energy saver bulb can be kept alight on 1 kWh of electricity. (Answer correct to 1 decimal place.)

b) If electricity costs 12 pence per kWh, what does it cost to keep this light bulb on for eight hours?

Using electrical power (cont'd)

6. A single bar radiator uses 1000 watts per hour.

a) How many units of electricity does it use if it is switched on for five hours?

b) How much does it cost to run for five hours at 13 pence per kWh?

7. Find the cost of using a 2000 W air conditioner for four hours if electricity costs 12 pence per kWh.

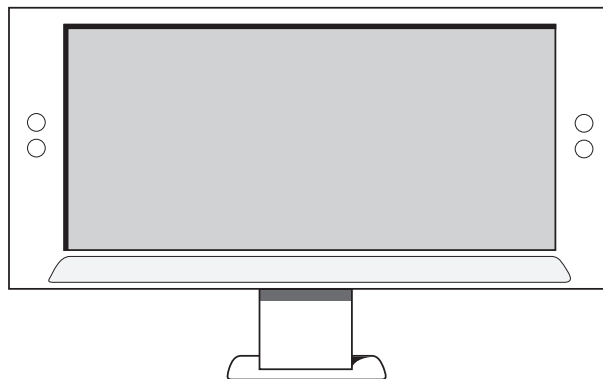
8. What will it cost to warm a room with a 2000 W heater, switched on from 6 pm to 10 pm, if electricity costs 12.54 pence per kWh?

9. The Collins family has a television set with a 250 W rating.

a) How many kWh of electricity does it use in one week if it is switched on for an average of nine hours per day?

b) What would it cost to run the television for a week at 12.54 pence per kWh?

10. The Naphri family uses an iron with a rating of 500 W for an average of seven hours per week. Find the cost of the electricity used to do the weekly ironing at a rate of 12.54 pence per kWh.



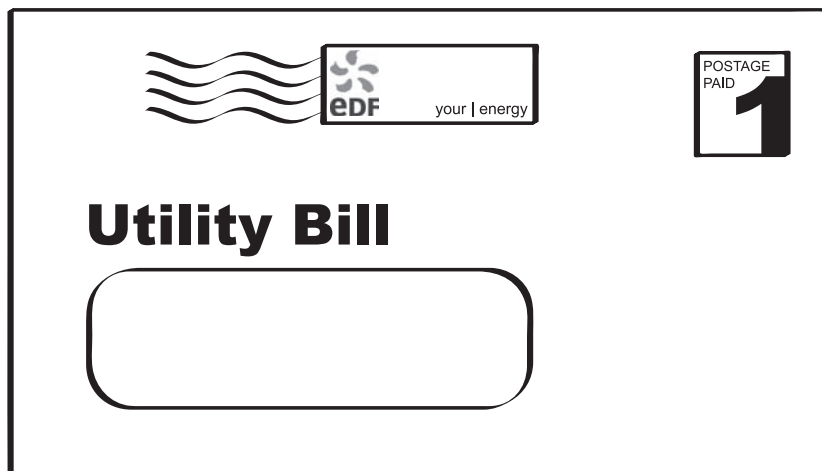
Paying the gas bill

Ellie received a bill for gas usage from EDF Energy for the period 01 October 08 – 31 Dec 08. This is part of it:

EDF Energy
Bill for 01 Oct 08 – 31 Dec 08
Bill breakdown 4th quarter 08

	Previous	Latest	Units	KWh	KWh charges	Total
Gas used between 01 Oct 08 – 31 Dec 08 92 days	8425	8761	336	3825	First 1400 at 5.1p	£71.40
					Next 2425 at 3.6p	£87.30
Total before VAT						

1. What is the total bill before VAT?
2. VAT is charged at 15%. What will Ellie pay in VAT?
3. What is the total amount, including VAT, Ellie has to pay?
4. What is Ellie's average gas usage per day for this period?
Write your answer to the nearest kWh per day.



Paying the gas bill (cont'd)

5. Ellie hopes to reduce her next bill for the first quarter of 2009 by 15%. If she succeeds, what will be her:

a) Total gas bill?

b) Average daily gas usage? Write your answer to the nearest kWh per day.

6. In the previous 92 days (3rd quarter 2008) Ellie's gas usage was 28 kWh per day.

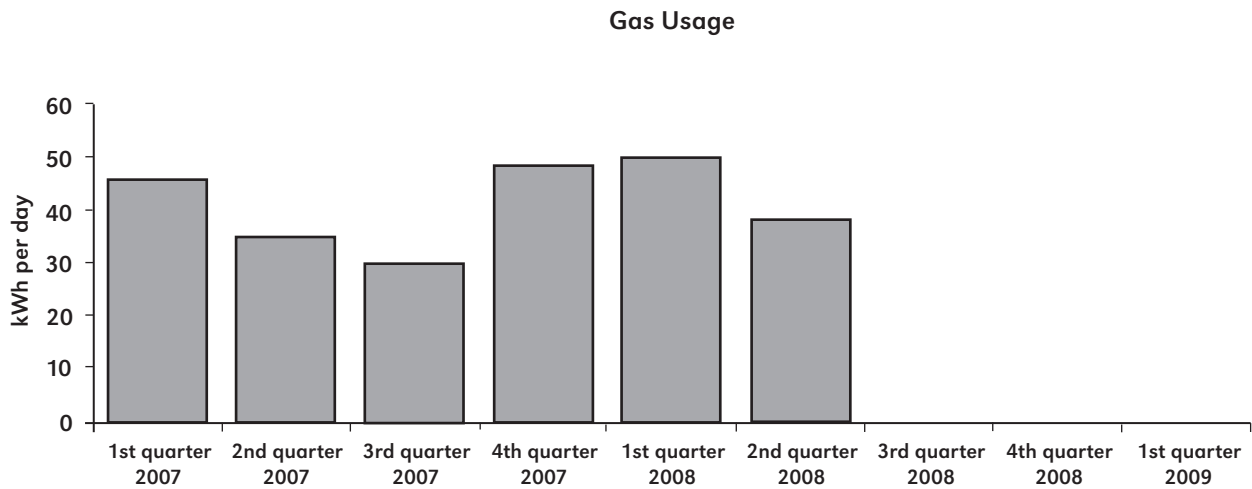
a) Work out the total number of kWh used in this period.

b) Work out the total charges (excluding VAT) for this period.

c) Work out the total bill for this period.

d) Calculate the percentage increase in the average daily use between the third and fourth quarter.

7. Use the figures from the previous questions to complete this bar chart.



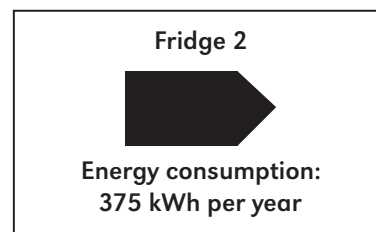
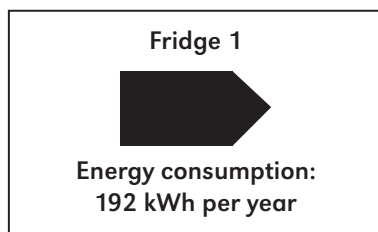
Appliances and energy use

Energy rating labels allow consumers to compare the energy efficiency of household appliances. They are mandatory across the UK for fridges, freezers, washing machines, tumble dryers and dishwashers.

The energy rating label has two main features:

- The rating gives a quick comparative assessment of the appliance's energy efficiency. This is on a scale from A to G. A being the most efficient.
- The comparative consumption, given in either kilowatt hours per year (kWh per year), providing an estimate of the annual energy consumption of the appliance or kilowatts per cycle, providing details of the average energy consumption each time a washing machine, tumble dryer or dishwasher is used.

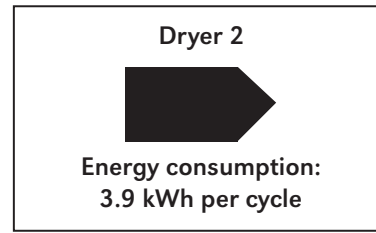
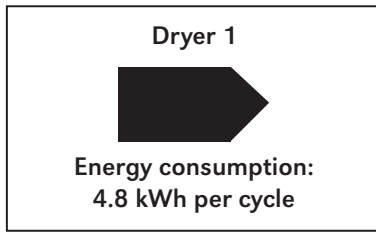
1. The energy rating labels on two fridges of similar size show the following information.



- a) Which fridge is more energy efficient?
- b) How many kilowatt hours of electricity would Fridge A use in one year?
- c) At 12.72 pence per kWh, how much would Fridge A cost to run for one year? (Answer to the nearest pence.)
- d) At 12.72 pence per kWh, how much would Fridge B cost to run for one year? (Answer to the nearest pence.)
- e) How much would be saved in one year by using the more energy efficient fridge?
- f) If each fridge has a life expectancy of 12 years, how much is saved over 12 years by running the more energy efficient fridge?
- g) Fridge A costs £488 to buy. Fridge B is on sale at £225. If you consider both the purchase price and the running cost for 12 years, which fridge is cheaper?

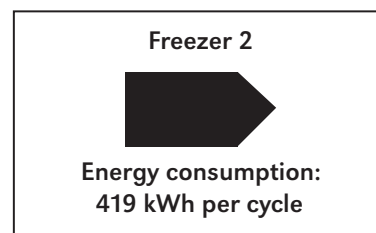
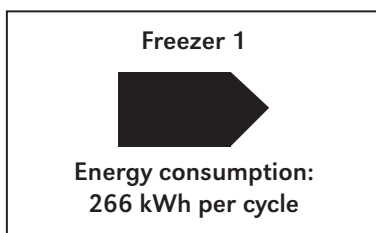
Appliances and energy use (cont'd)

2. The energy rating labels on two 5 kg tumble dryers show the following information.



- Which appliance is more energy efficient?
- At 14.53 pence per kWh, how much would Dryer 1 cost to run for one year? (Answer to the nearest pence.)
- At 14.53 pence per kWh, how much would Dryer 2 cost to run for one year? (Answer to the nearest pence.)
- How much would be saved in each cycle by using the more energy efficient tumble dryer?
- A family uses the dryer 120 times a year. How much would be saved in eight years by using the more energy efficient tumble dryer?
- Dryer 1 is on sale at £195. Dryer 2 is priced at £395. If you consider both the purchase price and the running cost for eight years, which tumble dryer is cheaper?

3. The energy rating labels on two chest freezers of similar size show the following information.



- Which freezer is more energy efficient?
- At 15.17 pence per kWh, how much would Freezer 1 cost to run for one year? (Answer to the nearest pence.)
- At 15.17 pence per kWh, how much would Freezer 2 cost to run for one year? (Answer to the nearest pence.)
- How much is saved over 10 years by running the more energy efficient freezer?
- Freezer 2 costs £128 less than Freezer 1. If you consider both the difference in purchase price and the running cost for 10 years, which freezer is cheaper?

Appliances and water use

The UK generally has adequate water resources for its needs, however there are regional areas where prolonged periods of low rainfall can put resources under pressure. Manufacturers are now required to display on certain household appliances information concerning their water consumption. By buying more water-efficient products, consumers can save money on their water and electricity bills as well as help the environment.

The following information appeared on two washing machines that can take loads of up to 6kg per wash (or cycle):

Washing machine A

**Water consumption 56 litres
(standard cycle)**

Washing machine B

**Water consumption 45 litres
(standard cycle)**

1. Which washing machine, A or B, is more water efficient?
2. How many litres of water would Washing machine A use to do four loads of washing?
3. How many litres of water would Washing machine B use to do four loads of washing?
4. Shannon and Luke do four loads of washing on average each week. If they purchased Washing machine A in preference to Washing machine B, how much more water would they use each week to do their washing?
5. How many kilolitres of water would Shannon and Luke save in one year if they purchased Washing machine B rather than Washing machine A?
6. Shannon and Luke also considered a smaller 4 kg washing machine with a water efficiency label as shown below. If they purchased this machine, they would need to do an average of six loads of washing each week.

Washing machine C

**Water consumption 52 litres
(standard cycle)**

- a) How many litres of water would this washing machine use to do six loads of washing?
- b) How many kilolitres of water would they use in one year to do their washing in this machine?

Appliances and water use (cont'd)

- c) Compared to Washing machine B, how much more water would this machine use to do Shannon and Luke's washing for one year?

Amy decided to purchase a dishwasher for her kitchen. She visited the local appliance store and looked at three similar appliances. Their water-efficiency labels are shown below.

Amy estimates that she will use the dishwasher four times each week.

<p>Dishwasher A</p> <p>Water consumption 13.9 litres (standard cycle)</p>

<p>Dishwasher B</p> <p>Water consumption 16.5 litres (standard cycle)</p>

<p>Dishwasher C</p> <p>Water consumption 18.9 litres (standard cycle)</p>

7. Which dishwasher is the most water efficient?
8. How many litres of water would Dishwasher A use to do four washes?
9. How many litres of water would Dishwasher B use to do four washes?
10. How many litres of water would Dishwasher C use to do four washes?
11. Amy decided to purchase Dishwasher B. She uses the dishwasher an average of four times each week. How many litres of water will this dishwasher use in one year?
12. Hazim purchased Dishwasher A. He also uses his dishwasher an average of four times each week. How many litres of water will this dishwasher use in one year?
13. How much more water would Hazim use in one year if he purchased Dishwasher B rather than Dishwasher A, based on using the dishwasher four times each week?
14. Alex purchased Dishwasher C. It has a 1.5 star water efficiency rating and uses an average of 18.9 litres of water each wash cycle. Alex uses her dishwasher five times each week. How many kilolitres of water will Alex's dishwasher use in one year?

Skills

Take measurements.
Use a scale to work out
actual dimensions.
Calculate area.

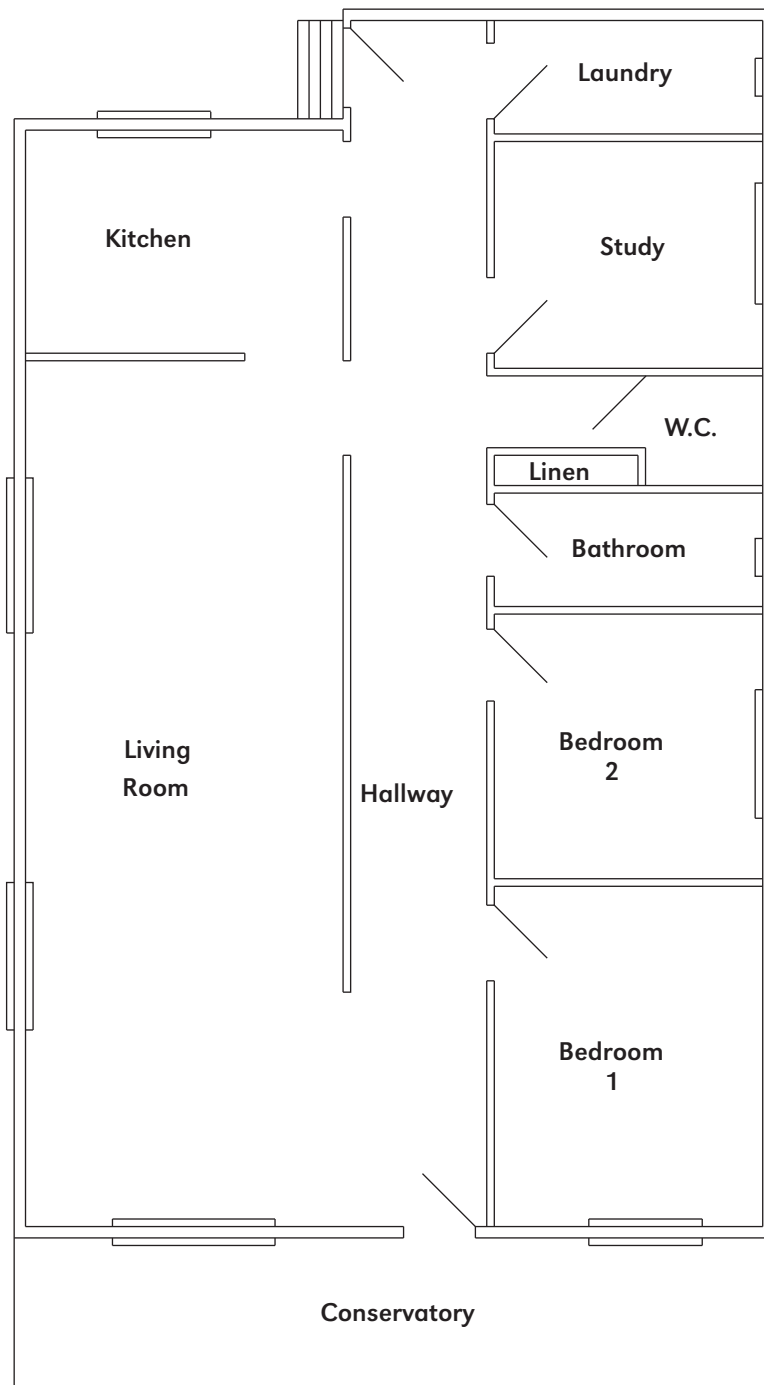
Using floor plans

The floor plan below has been drawn to scale. This plan is useful for redecorating purposes, but could not be used for building or adding extensions to a house. In these cases, more detailed architectural drawings would be required.

This plan shows the layout of the rooms and the main features of the house. It has been drawn to a scale of 1:100 where 1 cm on the plan represents an actual distance of 1 metre. For example, the conservatory is 2 cm wide, which equates to an actual distance of 200 cm or 2 m.

The windows are shown as thicker sections of the outside wall. All doors are drawn partly open to indicate which side has hinges and the direction of swing when the doors are opened.

House floor plan
Scale 1:100



Using floor plans (cont'd)

1. On the floor plan on the previous page, use your ruler to measure the length and width of the living room to the nearest millimetre.
2. Use the scale 1:100 to find the actual length and width in metres of the living room.
3. Measure the dimensions of bedroom 1 on the plan to the nearest millimetre.
4. What are the actual dimensions of bedroom 1 in this house?
5. What is the length of the hallway in this house? (Measure from the front door to the back of the house.)
6. How wide is the actual hallway? (Hint: It is easier to measure outside the bedroom or the study where there is a wall on each side of the hallway.)
7. What are the actual dimensions of these rooms?
 - a) bedroom 2
 - b) the study
 - c) the kitchen
 - d) the bathroom
 - e) the laundry
8. What is the area of the living room in square metres?
9. What is the area of the hallway in square metres?
10. What is the area of these rooms?
 - a) bedroom 1
 - b) bedroom 2
 - c) the study

Using floor plans (cont'd)

11. New carpet is to be laid in the two bedrooms and the study.

a) What is the total area of these three rooms?

b) Carpet is sold by the metre off a roll, which is 3.7 metres wide (1 lineal metre of carpet is $1 \text{ m} \times 3.7 \text{ m}$, or 3.7 m^2). Calculate how many lineal metres of carpet will be needed to carpet this area. Round your answer up to the next whole number.

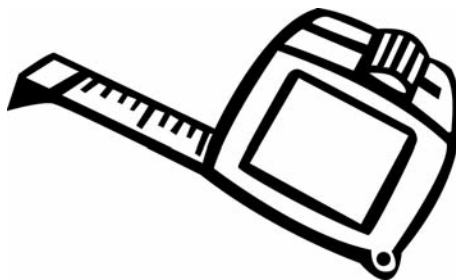
c) A professional carpet layer calculates that 12.5 lineal metres of carpet will be required. He quotes £45 per square metre for the chosen carpet, including underlay and labour. How much will he charge to carpet these three rooms?

12. What is the perimeter of bedroom 1?

13. The skirting boards around the bottom of the walls need to be replaced in bedroom 1. What is the total length of skirting board needed? (Hint: Do not include the doorway in your calculations.)

14. The skirting boards in the living room and the hallway also need to be replaced. What total length of skirting board will be required for these two rooms? (Hint: Be careful to measure only the lengths of the actual walls, especially in the hallway.)

15. If skirting board costs £10.30 per metre, what is the total cost of replacing the skirting boards in the living room, hallway and bedroom 1?



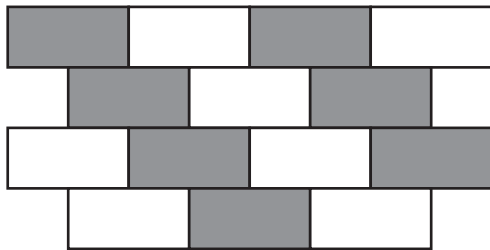
Tiling a floor

Note: You will need 1 cm grid paper to complete this worksheet.

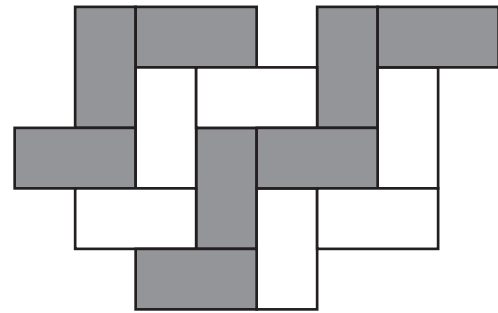
When Kathy and Carl purchased their first home together, they decided to renovate the kitchen before they moved in. The kitchen is rectangular in shape, measuring 4250 mm \times 3250 mm.

The cupboards shown in the plan on the next page are 650 mm wide and sit on the floor. The rest of the floor area is to be tiled. Carl has chosen ceramic floor tiles that are designed to fit together without using grout. The tiles are rectangular and measure 200 mm \times 100 mm.

Kathy has not yet decided which pattern they will use to lay the tiles. She is considering four patterns she has seen: brick pattern, herring-bone pattern and two patterns often found in parquetry floors.

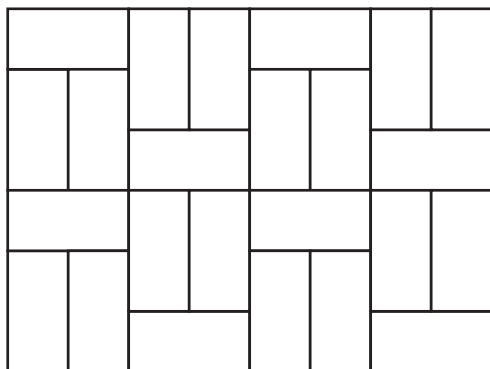


Brick pattern

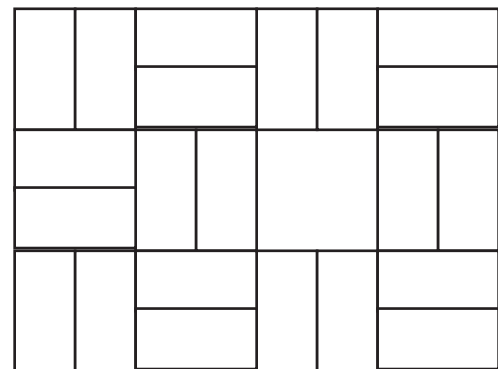


Herring-bone pattern

1. On 1 cm grid paper, draw a rectangle 12 cm \times 8 cm and fill it with 2 cm \times 1 cm rectangles in a brick pattern. You will need to use some half tiles to completely fill the rectangle.
2. On 1 cm grid paper, draw a rectangle 12 cm \times 8 cm and fill it with 2 cm \times 1 cm rectangles in a herring-bone pattern. You will need to use some half tiles to completely fill the rectangle.
3. The remaining two patterns shown below are often found in parquetry floors. For each pattern, draw a rectangle 12 cm \times 6 cm on 1 cm grid paper and then fill it with 2 cm \times 1 cm rectangles in the tiling pattern. You should not need to use any half tiles in these patterns.



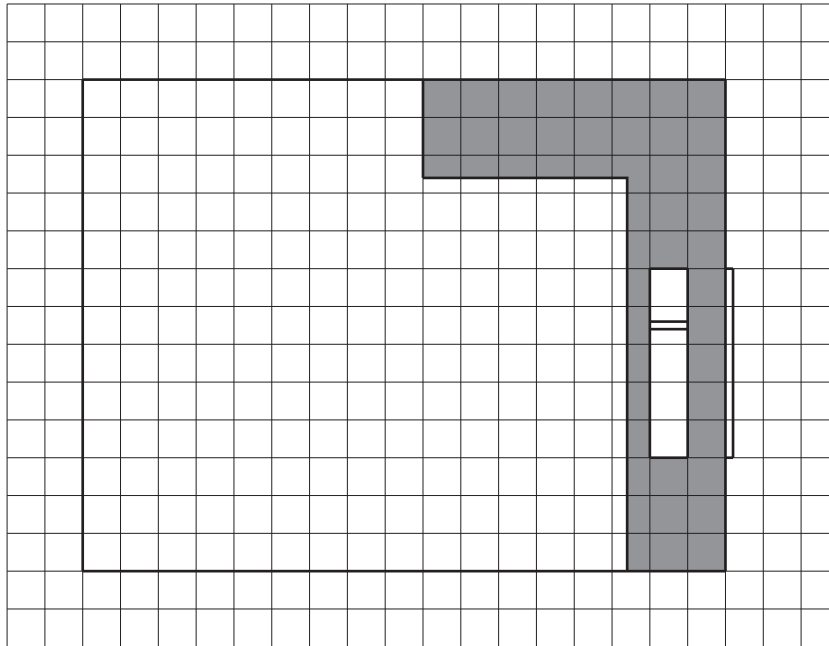
Parquetry pattern 1



Parquetry pattern 2

Tiling a floor (cont'd)

This scale drawing shows the floor plan of the kitchen. It is drawn to a scale of 1:50.



4. On the floor plan, what distance is represented by 1 cm?
5. On the floor plan, what area does 1 cm² represent?
6. What is the total area of the kitchen in square centimetres?
7. What area is covered by the cupboards and will not be tiled?
8. What is the area of the floor to be tiled (in square centimetres)?
9. What is the area of one rectangular tile (in square centimetres)?
10. What number of tiles will be required?
11. Why might more tiles be needed?

Tiling a floor (cont'd)

Kathy decides to allow an extra 10% in estimating the cost of the tiles. The tiles Carl has chosen come in boxes of 20 and cost £35.20 per box.

12. How many boxes of tiles will be needed, allowing for the extra 10%?
(Round your answer up to the next whole number.)

13. If Kathy and Carl purchase this number of boxes, what will be the total cost of the tiles?

Carl is not confident that he and Kathy will be able to lay the tiles themselves and considers hiring a professional tiler to do the job. He is told that a tiler will charge £35 per square metre for the job.

14. What is the area to be tiled, in square metres? Answer correct to 1 decimal place.

15. How much will Carl and Kathy have to pay the tiler to tile their kitchen floor?

16. What would be the total cost of tiling the floor if they employ the tiler?

Tony Davies Tiling Services

13 Hill View, Chester, CHI 8RN

Kathy and Carl
1 New Road
Chester
CH3 4NJ

1 October 2009

Quotation

Prepare floor – remove all previous flooring and dispose. Tile and grout. Exclusive of materials.

£35 per square metre

Quote valid for 30 days.

Tony Davies

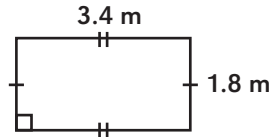
Tony Davies

Painting a room

In this worksheet you will need to calculate the area of a rectangle.

Area of a rectangle = length x breadth

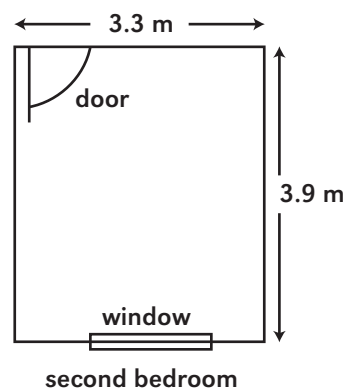
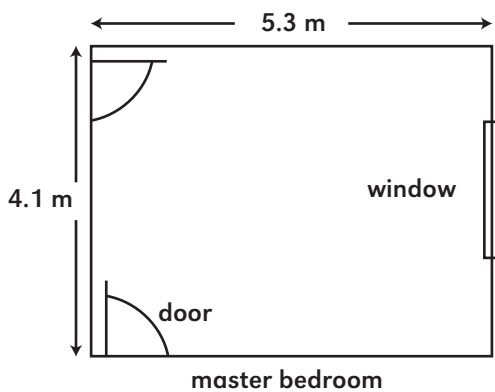
For example:



$$\begin{aligned} \text{Area} &= 3.4 \times 1.8 \\ &= 6.1 \text{ m}^2 \text{ (to 1 decimal place)} \end{aligned}$$

Mia and Ben are planning to redecorate their home. They are going to start by repainting two bedrooms and the living room.

They will do this work themselves and are using floor plans and some measurements to determine how much paint they need to purchase.



1. The master bedroom measures 5.3 m × 4.1 m. The ceiling is 2.4 m above the floor. The doors are 1 m wide and 2 m high. The window measures 1.8 m × 1.3 m.

a) Calculate the wall area to be painted. (Hint: This does not include the doors and the window.)

b) Calculate the area of the ceiling.

2. The second bedroom measures 3.9 m × 3.3 m. This ceiling is also 2.4 m above the floor. The window in this room measures 1.6 m × 1.3 m and the door is 1 m × 2 m.

a) Calculate the wall area to be painted. (Hint: This does not include the door and the window.)

b) Calculate the area of the ceiling.

Painting a room (cont'd)

3. The two bedrooms are going to be painted with the same colours. The walls will be soft blue and the ceilings will be white.

a) What is the total area of the two ceilings?

b) If 1 litre of white ceiling paint covers 14 m^2 with one coat, how many litres of paint will be needed to cover the two ceilings with two coats of paint? Round your answer to the next whole number.

c) A 4 litre tin of white ceiling paint costs £25.96 and a 1 litre tin of the same paint costs £12.49. How many tins of paint are required for the two ceilings? How much will they cost?

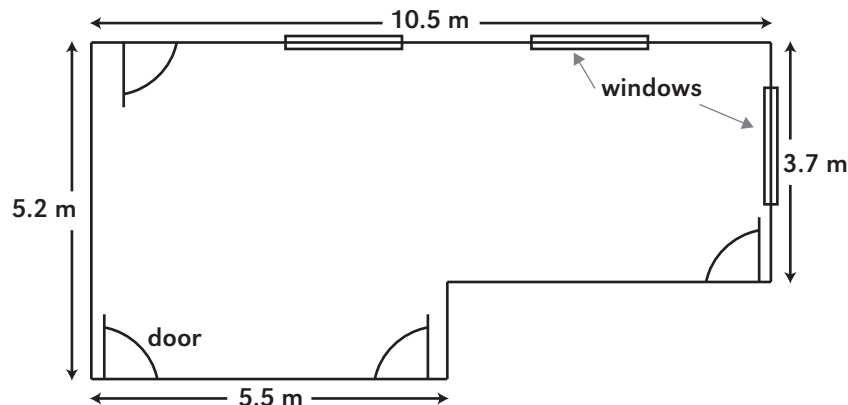
d) What is the total wall area to be painted in the two bedrooms?

e) If 1 litre of flat acrylic paint covers 16 m^2 with one coat, how many litres of paint will be needed to cover the total wall area with two coats? Round your answer to the next whole number.

f) This paint is available in 4 litre tins costing £30.96 and in 1 litre tins costing £13.95. How many tins of paint are required for the walls of the two bedrooms? How much will they cost?

g) What is the total cost of the paint required for the two bedrooms (walls and ceilings)?

4. The house has a large L-shaped living room.



This room has three windows, each measuring $1.8 \text{ m} \times 1.3 \text{ m}$, and four doors, each $1 \text{ m wide} \times 2 \text{ m high}$. The ceiling in this room is 2.6 m high.

a) Calculate the area of the ceiling.

b) The ceiling is to be painted raw sugar in colour, using a flat finish ceiling paint. If 1 litre of this paint covers 14 m^2 with one coat, how many litres of ceiling paint of this colour are required to paint the ceiling with two coats of paint? Round your answer to the next whole number.

Painting a room (cont'd)

- c) This paint costs £27.99 for a 4 litre tin and £12.99 for a 1 litre tin. How many tins of paint are needed to paint the ceiling with two coats of paint? How much will they cost?
- d) Calculate the area of the walls of the living room that will need to be painted. (Hint: This does not include the doors and the windows.)
- e) The walls are to be painted the same colour as the ceiling, but using a low-sheen (satin finish) paint. If 1 litre of low-sheen paint covers 15 m^2 with one coat, how many litres of paint will be needed to cover the walls of the living room with two coats of paint? Round your answer to the next whole number.
- f) This paint is available in 4 litre tins costing £31.49 and in 1 litre tins costing £12.75. How many tins of paint are needed for the walls of the living room? How much will they cost?
- g) What is the total cost of the paint required for the living room (walls and ceiling)?
5. What is the total cost of the paint that Mia and Ben will need to purchase to paint the two bedrooms and the living room?
6. When they had finished painting, Mia and Ben decided to replace the carpet in the living room and the two bedrooms. The carpet for the living room will cost £51 per m^2 including underlay and professional laying. The carpet for the bedrooms will cost £42 per m^2 including underlay and professional laying.
- a) Calculate the area of the living room floor. Round up to the next whole m^2 .
- b) Calculate the cost of the carpet for the living room.
- c) Calculate the total area of the floors in the two bedrooms. Round up to the next whole m^2 .
- d) Calculate the cost of the carpet for the two bedrooms.
- e) What will be the total cost of the new carpet for these three rooms?

Furnishing a flat

1. Adam has decided to move out of his family home and into a small flat. He has found a one bedroom flat in an area where he would like to live, but it is not furnished. He has made a list of the furniture he would like to buy and has checked prices in advertising brochures.

Adam's list			
Living area:		Dining area:	
Sofa	£599	Table with two chairs	£299
Armchair	£249		
Coffee table	£199	Bedroom:	
Bookcase	£179	Bed with mattress	£499
		Bedside table	£99
		Wardrobe	£799

- a) What is the total cost of the furniture that Adam plans to purchase?
- b) Adam has seen a dining table and two chairs in a second-hand store priced at £150 and a wardrobe priced at £240. How much will he save by purchasing these items at the second-hand store?
- c) The Fabulous Furniture store has advertised a 'Home starter' package for three rooms, priced at £1,999. The package includes a sofa, a coffee table, five piece dining suite, a bed with a mattress and a bedside table. Adam would need to purchase a wardrobe separately. Is this package a cheaper option than purchasing the individual new items on his list?
- d) Adam is also considering a different flat, which is partly furnished. If he decides to rent this flat, he will only need to purchase a bed, an armchair and the coffee table. What will be the total cost of these items?
- e) Adam will need to buy these appliances: Microwave oven (£54.99), toaster (£17.49), electric kettle (£19.99) and a vacuum cleaner (£44.99). If he rents the partly furnished flat, what will be the total cost of furniture and these appliances?

Furnishing a flat (cont'd)

2. Martina and Ray are setting up their first home together. They have found a two bedroom flat and are planning how they will furnish their new home. They already own many items of the furniture they need, but want to purchase some new furniture together. They have made a list of new furniture to buy and have been looking around various stores to check prices.

Three piece suite	£1,299
Wall display unit	£599
Rug	£199
Dining table with four chairs	£799
Bedroom set	£1,799

- a) What is the total cost of the furniture they plan to buy?
- b) Ray wants to put new curtains in the lounge and the two bedrooms. Each pair of curtains will cost £150 plus £47.99 for each curtain rail. What is the total cost of the curtains for these three rooms?
- c) They also need to purchase a fridge for the kitchen (£296) and Martina would really like a new plasma television (£799.99). Together they have saved £5,500 and they will borrow any additional amount. How much will they need to borrow?
3. Bronwyn is going to share a two bedroom flat with a friend, who has already furnished the living areas. Bronwyn needs to furnish her bedroom, which has a built-in wardrobe. It currently contains no furniture. Bronwyn needs to purchase the furniture in the list below.

List 1

A bed – £499
 A small bedside table – £89
 A desk – £110
 A chair – £69

List 2

A pillow – £12.95
 Sheets and pillowcases – £49.99
 A blanket – £32.95
 Towels – £19.99 for one pair

- a) What is the total cost of the furniture that Bronwyn needs to purchase?
- b) Bronwyn also needs to buy the items in List 2. How much will she pay for them?
- c) What is the total cost of all the items Bronwyn needs to purchase?

Furnishing a flat (cont'd)

4. Two friends, Jenny and Neve, are planning to share a two bedroom flat. They need to buy furniture and other items before they can move in. They have agreed to share the cost by each having a list of items to buy in addition to the items for their own bedrooms. They prepared the following lists of items for each person to purchase.

Jenny	
Sofa	£499
Display wall unit	£399
Coffee table	£99
Bed	£299
Bedside table	£89
Wardrobe	£253
Microwave oven	£64
Cutlery	£74
Saucepans	£110

Neve	
Two armchairs	£249
Dining table	£199
Four chairs	£79 each
Bed	£279
Desk and chair	£110
Wardrobe	£240
Toaster	£29
Electric kettle	£22
Television	£470
Plates and cups	£89

a) What is the total cost of the items that Jenny has agreed to purchase?

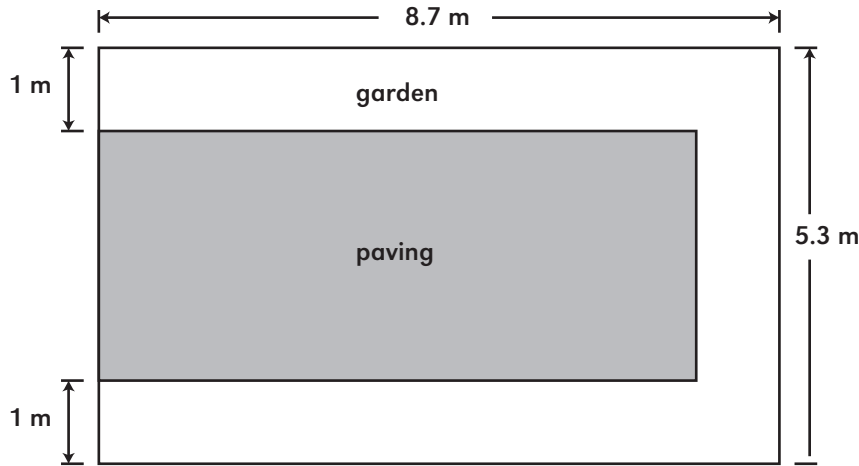
b) What is the total cost of the items that Neve has agreed to purchase?

c) Who will pay more? (Jenny or Neve?) How much more will she pay?

d) Jenny and Neve are also sharing the cost of a washing machine (£325) and a second-hand fridge (£150) and will purchase their own bed linen and bath towels (£150 each). What is the total cost of furnishing the new flat for each person?

A courtyard garden

Kamlesh has a rectangular courtyard ($8.7\text{ m} \times 5.3\text{ m}$) with a garden that is 1 metre wide around three sides, as shown in this diagram.



Not to scale

- The courtyard will be paved with square paving blocks that each measure $220\text{ mm} \times 220\text{ mm}$.
 - What is the length of the area to be paved?
 - How wide is the area to be paved?
 - Calculate the area of the courtyard to be paved.
 - How many paving blocks will fit along the length of the area to be paved?
 - How many paving blocks will fit across the width of the area to be paved?
 - How many paving blocks will be required to cover this area?
- The paving blocks cost $\pounds 2.35$ each. How much will it cost to pave this courtyard?
- The garden around this courtyard is to be replanted. Kamlesh has decided to plant a border of geraniums around the outside edge of the courtyard. She will place 1 plant every 25 cm.
 - How many plants will Kamlesh need to buy?
 - These plants cost $\pounds 1.55$ each or $\pounds 12$ for ten plants. How much will Kamlesh need to pay for the plants to go around the border of her courtyard?

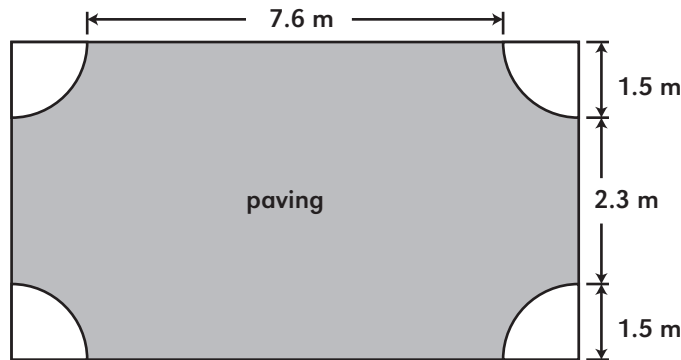
A courtyard garden (cont'd)

4. Kamlesh has made a list of the plants she needs to buy for the garden. Calculate the cost of each type of plant and the total cost of the plants.

Kamlesh's list			
5 fuschias	@	£9.95 each =	_____
15 lavender	@	£3.50 each =	_____
30 red fountain grass	@	£2.65 each =	_____
Geraniums (your answer from question 3)		=	_____
TOTAL COST OF THESE PLANTS		=	_____

5. What is the total cost of the paving and the plants for this courtyard?

Melinda and Joe have a rectangular courtyard. They plan to pave the courtyard and build a garden in each corner. Each garden will be in the shape of a quarter circle, as shown in this diagram.



Not to scale

6. Calculate the total area of the four gardens, correct to 2 decimal places. (Hint: The four sectors will form a circle, area of a circle = πr^2 .)
7. a) What is the total length of this courtyard (including the gardens)?
- b) What is the total width of the courtyard?
- c) Calculate the area of the rectangular courtyard, including the gardens.
8. Calculate the area of the courtyard to be paved.

A courtyard garden (cont'd)

9. The paving blocks that Melinda and Joe plan to use are rectangular in shape and measure 200 mm \times 400 mm.

a) What is the area that will be covered by each paving stone?
(Answer in square metres.)

b) Work out an estimate of the number of paving blocks required by dividing the area of the courtyard to be paved by the area covered by each paving stone.

10. Joe decided to add fertiliser to the soil in the four corner gardens. The instructions recommend that the fertiliser be added to the soil at a rate of 0.6 kg per square metre. How many kilograms of fertiliser should Joe add to each corner garden? (Answer correct to 1 decimal place.)

11. Melinda has prepared a list of the plants she wants to plant in the gardens. Calculate the cost of each type of plant and the total cost of the plants.

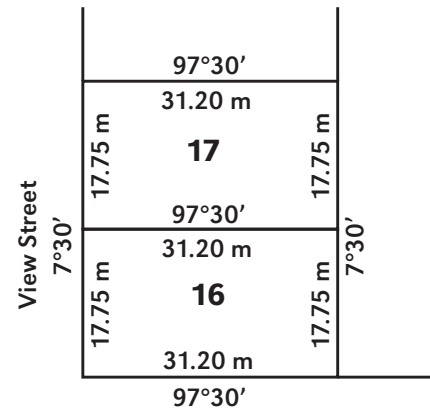
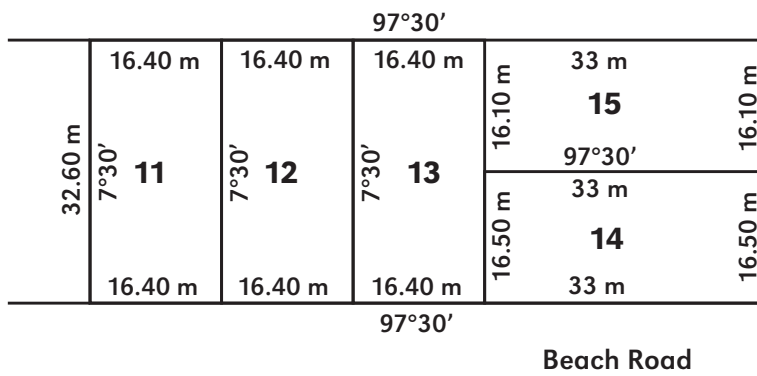
2 rose plants	@	£12.99 each = _____
2 rosemary plants	@	£8.99 each = _____
8 honeysuckle	@	£7.99 each = _____
12 marigolds	@	£1.25 each = _____
TOTAL COST OF THESE PLANTS		= _____

Land area

Local government rates are sometimes based on the size of a block of land and the house being built on it. When a property is advertised for sale, the estate agent indicates the area of the land.

This diagram shows part of a surveyor's plan of plots for a new housing estate. Each plot of land is rectangular in shape. All angles are right angles. For each plot of land, it shows:

- the plot number
- the length of each boundary (in metres)
- the bearing of each boundary (in degrees and minutes).



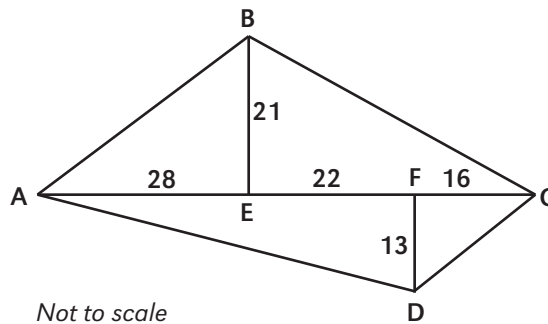
Not to scale

1. What is the width of plot number 12?
2. What is the length of plot number 12?
3. Calculate the area of plot number 12.
4. Calculate the area of plot number 14.

Land area (cont'd)

House plots are not always rectangular. Often the corner angles are not right angles. In these cases, a method known as a traverse survey (or offset survey) may be used to measure distances and calculate the area. In this method, a suitable diagonal or traverse line is selected. Distances to the other corners are measured at right angles to the traverse line.

5. This diagram shows the measurements obtained in a traverse survey of the plot of land with corners A, B, C and D. The measurements shown are in metres. The length of the diagonal (traverse line) AC has been broken into three sections: AE, EF and FC.



- a) What is the length of the diagonal AC?

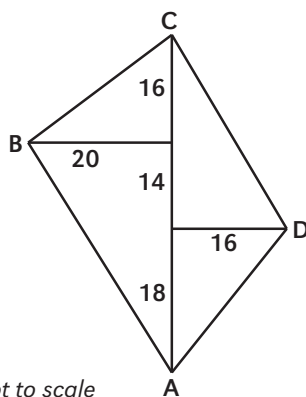
- b) Calculate the area of the triangle ABC. Use the formula:
Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height}$.

- c) Calculate the area of the triangle ADC.

- d) What is the area of the block of land?

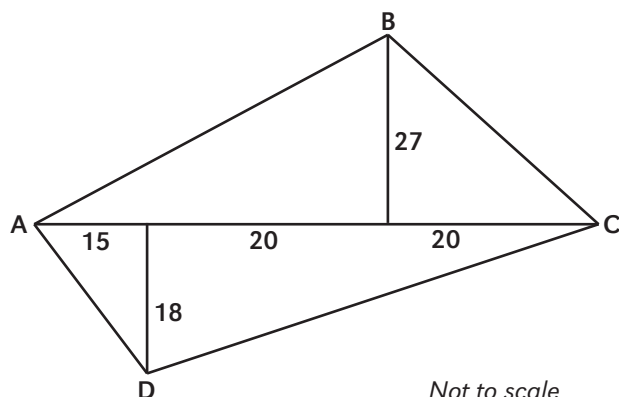
6. Calculate the area of the block of land shown in each diagram. (All lengths are in metres.)

a)



Not to scale

b)

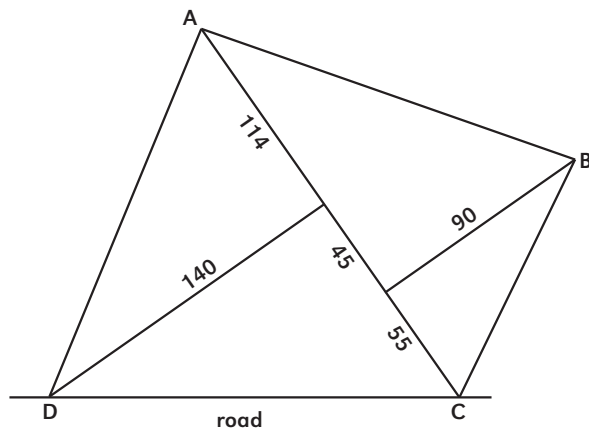


Not to scale

Skills
 Calculate the area of triangles. Calculate length.
 Calculate the area of a trapezium.

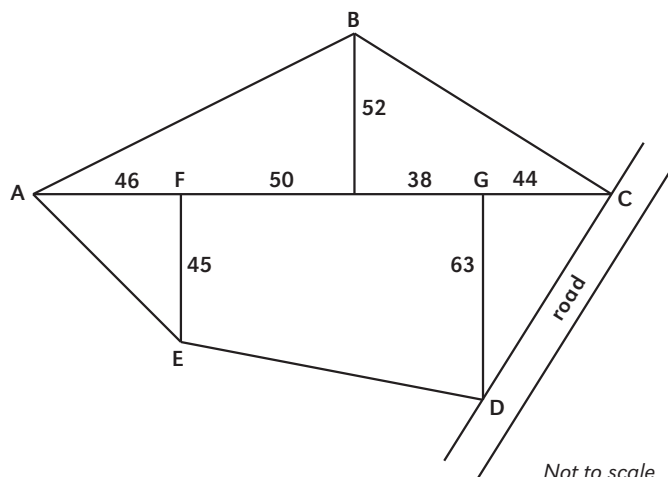
Land area (cont'd)

The same method may be used to calculate the area of many shapes (small or large) bounded by straight sides. The following questions apply to larger plots of land.



Not to scale

7. a) Calculate the area of triangle ABC (in square metres).
 - b) Calculate the area of triangle ADC (in square metres).
 - c) What is the total area of this plot of land in square metres and hectares? (1 hectare = 10,000 m²)
8. This plot of land has five straight sides. The distances obtained in a traverse survey are shown in the diagram.



Not to scale

- a) What is the length of the diagonal AC (traverse line)?
- b) Calculate the area of the triangle ABC.
- c) Calculate the area of each triangle AEF and CDG.
- d) Calculate the area of the trapezium GDEF. Use the formula:
 Area of a trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{distance apart}$.
- e) What is the total area of this plot of land, in hectares? (Answer correct to 2 decimal places.)

Council tax

It doesn't matter whether you live in a house or a flat, or own or rent your property, every household in the UK has to pay a council tax bill.

The money raised through this tax is used to help to pay for local services such as education, rubbish collection, road maintenance, police and fire rescue.

The amount charged to each household is based on a valuation band. There are eight separate bands from A to H. Each band represents the amount that the property was worth on 1st April 1991.

This table shows the valuation bands, how the money is divided up between the council, police force and fire service and the total bill a household can expect to pay in a typical year.

Valuation band	City Council	Police Authority	Fire Authority	Total Bill	25% discount for one person
A (up to £40,000)	£806.47	£99.48	£46.12	£952.07	
B (£40,001 to £52,000)	£940.89	£116.06	£53.81	£1,110.76	
C (£52,001 to £68,000)	£1,075.30	£132.64	£61.49	£1,269.43	
D (£68,001 to £88,000)	£1,209.71	£149.22	£69.18	£1,428.11	
E (£88,001 to £120,000)	£1,478.53	£182.38	£84.55	£1,745.46	
F (£120,001 to £160,000)	£1,747.36	£215.54	£99.93	£2,062.83	
G (£160,001 to £320,000)	£2,016.18	£248.70	£115.30	£2,380.18	
H (over £320,000)	£2,419.42	£298.44	£138.36	£2,856.22	

1. Nihal lives in a property that has been valued as band B.

a) How much will his total council tax bill cost?

b) What percentage of the total amount will go to the fire authority?
(Answer to two decimal places.)

c) What percentage of the total amount will go to the city council?
(Answer to two decimal places.)

2. Laura lives in a property that has been valued as Band F.

a) How much will her total council tax bill cost?

b) What percentage of the total amount will go to the police authority?
(Answer to two decimal places.)

Council tax (*cont'd*)

The only exception to the amount of money that a household would have to pay in council tax is when there is only one person living in the property. In this instance, a 25% discount is applied to the council tax bill.

3. Calculate the cost of a council tax bill for a person living on their own for each band and write your answer in the last column of the table.
4. Nihal lives on his own. Calculate how much money the council, police and fire authorities will receive after the 25% discount:

a) City council

b) Police authority

c) Fire authority

Many councils allow households to pay their council tax bill monthly, or in ten equal instalments spread across the year.

5. Laura has decided to pay her council tax bill in ten equal instalments. Calculate how much each instalment will be. (Answer to two decimal places.)

6. Nihal has decided to pay his council tax bill monthly. Calculate how much each instalment will be. (Answer to two decimal places.)

7. Laura and her family are moving house. The tax band for her new property is Band G. Calculate the percentage increase in council tax she will pay over the year. (Answer to two decimal places.)

8. If Laura continues to pay her council tax in ten instalments, how much will each instalment be for her new tax bill? (Answer to two decimal places.)

9. Nihal is moving in with his girlfriend. The tax band for his new property is Band D. Calculate the percentage increase in council tax he will pay over the year. (Answer to two decimal places.)

10. Nihal has chosen to continue paying his council tax bill in monthly instalments. How much will he now pay per month? (Answer to two decimal places.)

On the net

Getting the best deal on an internet connection takes a bit of work. There are many service providers and plans available. There are even websites that help you to compare plans from different companies.

This table sets out some examples from three service providers. All require a twelve-month contract.

Price	Provider	Speed (Megabits per second)	Download limit (per month)	Penalty per megabyte	Set-up cost
£12.72	Tiger T	16 MBps	100 MB	10 pence	£30.00
£14.65	Angel	16 MBps	300 MB	12 pence	£29.95
£16.00	Tiger T	24 MBps	500 MB	14 pence	£29.99
£19.99	Top Talk	24 MBps	700 MB	8 pence	£29.35
£20.54	Angel	50 MBps	2 Gb	8 pence	£18.95
£24.46	Tiger T	50 MBps	5 Gb	10 pence	£24.95
£29.35	Top Talk	50 MBps	None	-	30.00

*1024 MB = 1Gb

1. Simon has decided to move into his own place and needs to get connected to the internet. He uses the internet for email and to download MP3 music files as well as to view web pages. Simon chooses the Top Talk £19.99 plan.

a) How much is the set up cost?

b) How much does Simon pay per month if he does not exceed the download limit?

c) How much will he pay in the first year, including the set-up cost, if he does not exceed the monthly download limit?

2. Sarah uses the internet for email, to view web pages and to play games online. She is currently on the £12.72 plan with Tiger T. She uses an average of 125 MB per month.

a) How much would she pay in 1 month when she uses 125 MB?

b) How much would she pay for 1 year on this plan? (Do not include the set-up costs.)

On the net (*cont'd*)

c) How much would she pay in a month when she uses 125 MB on the Angel £14.65 plan?

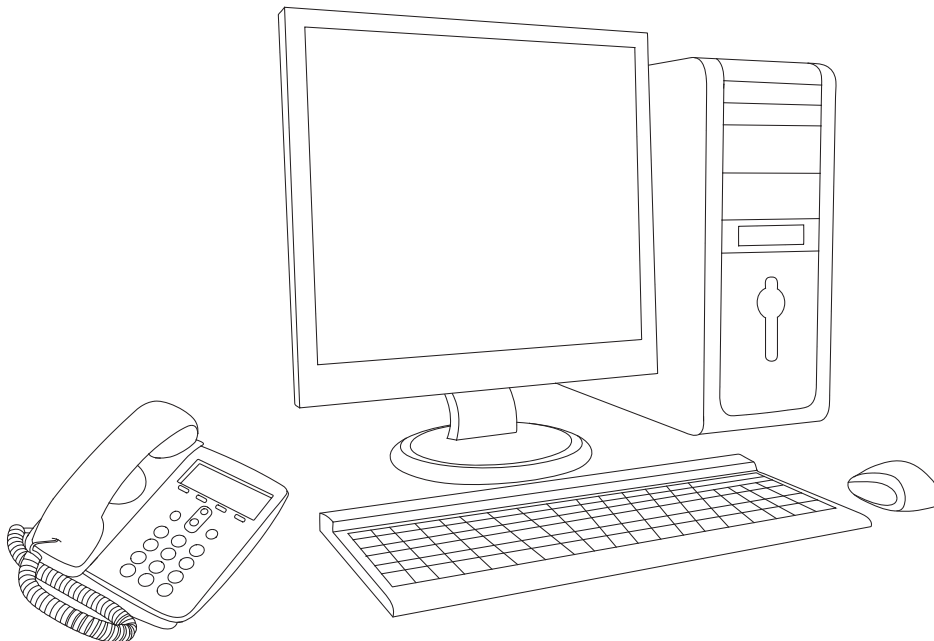
d) How much would she pay for 1 year on the Angel £14.65 plan? (Do not include the set-up cost.)

e) Sarah changed to the £16.00 plan with Tiger T and did not have to pay the set-up cost because she was still using the same service provider. How much will she pay for 1 year on this plan if she does not exceed the download limit?

3. Mahmoud is a heavy user of the internet. He plays games online (9 hours per week at 12 MB per hour), downloads MP3 files and video clips online (464 MB each month) and uses email and web pages (25 MB per month).

a) What is the total number of megabytes he downloads each month?

b) What would be the cheapest monthly plan that Mahmoud could select from those listed in the table, without exceeding the monthly download limit?



Household budgets

When Adam decided to move into a flat on his own, he first considered how much he could afford to pay in rent. He prepared a weekly budget of all his expenses throughout the year, including all his current expenses and estimating new expenses he would have when he lived on his own.

Adam started by listing all his annual expenses and converted them to weekly amounts by dividing the annual amount by 52. (There are actually 52 weeks plus one extra day in a normal year.)

Expense	Annual amount	Weekly amount
Road tax	£120.00	
Car insurance	£324.00	
MOT	£53.10	
Council tax	£1,080.00	
Clothes and shoes	£480.00	
TV licence	£142.50	

Adam then listed all his other regular expenses and converted them to weekly amounts, rounding each amount to the nearest pence. He divided quarterly payments by 13, and divided monthly amounts by 4.

Expense	Payment	Weekly amount
Telephone/internet	£120 per quarter	
Electricity	£28 per month	
Gas	£24 per month	
Water	£54 per quarter	
House insurance	£17 per month	
Car loan	£155 per month	

Finally, Adam listed all his weekly expenses.

Expense	Weekly amount
Groceries	£50.00
Petrol	£22.50
DVD rentals	£4.00
Entertainment	£20.00
Newspapers and magazines	£5.00
Savings	£6.25

1. a) Complete these tables and then calculate Adam's average total weekly expenditure.

b) Adam's weekly net pay (after tax) is £331.93. What is the maximum amount that he can afford to pay in rent per week?

Household budgets (cont'd)

2. When Jenny and Neve decided to share a flat, they prepared a monthly budget for all household expenses and agreed that these expenses would be shared equally.

Expense	Payment	Monthly amount
Rent	£148.00 per week	
Telephone	£84 per quarter	
Electricity	£156 per quarter	
Water	£66 per quarter	
Gas	£54 per quarter	
Food and groceries	£80 per week	

- a) Complete this table of household expenses. Multiply the weekly amounts by 4.3 (the average number of weeks in a month).

- b) What is the monthly total of their budget?

- c) How much should each person contribute to the monthly budget?

3. Martina and Ray set up a monthly budget to help them manage their expenses.

- a) Complete this table of Martina and Ray's monthly budget. (Use 1 month = 4.3 weeks.)

Expense	Payment	Monthly amount
Rent	£175.00 per week	
Telephone/internet	£43.00 per month	
Electricity	£195.00 per quarter	
Water	£66.00 per quarter	
Council tax	£117.00 per month	
Car tax	£120 per year	
MOT	£53.10 per year	
Car insurance	£856.00 per year	
Petrol	£42.00 per week	
Clothes and shoes	£624.00 per year	
TV licence	£142.50 per year	
House insurance	£325.00 per year	
Food and groceries	£92.00 per week	
Entertainment	£22.00 per week	
Newspapers and magazines	£6.50 per week	

- b) What is their total monthly expenditure?

What time is it?

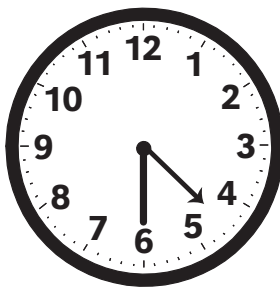
People use different methods to tell the time. We need to be able to read clocks in both analogue and 12 hour (digital) time so that we know when it is time to get up in the morning, when it is time for lunch and when it is time for other important things in our daily lives. We also need to be able to recognise 24 hour time; for example, when we want to program a video or DVD recorder.

We can give a time by stating the hours and minutes; for example, 4.15, 8.30 and 10.50. These are digital times and are what you see on a digital watch or clock.

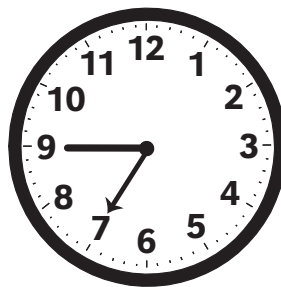
When we want to specify whether it is morning or evening, we use *am* for morning (ante meridiem, meaning 'before noon' or 'before midday') and *pm* for afternoon or evening (post meridiem, meaning 'after noon'). Alternatively we can state the number of minutes past the hour or before the hour (e.g. 10 minutes past 2, 20 minutes to 9, half [an hour] past 8). These are analogue times.

1. Write these times in digital form (hours and minutes) and also in analogue form ('minutes to' or 'minutes past').

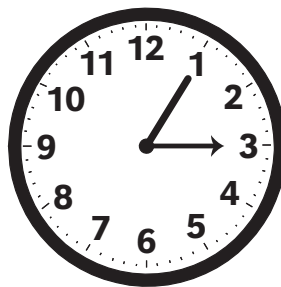
a)



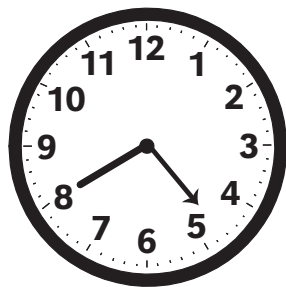
b)



c)

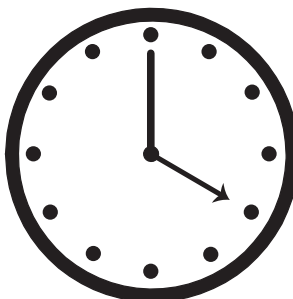


d)

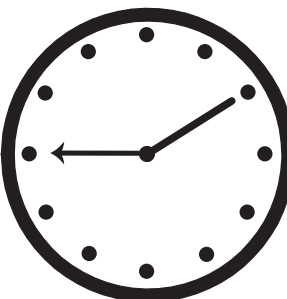


2. Some watches and clocks have no numbers on their faces, just marks to indicate the hours. Others have marks for the quarter hours only. Write these times in digital form.

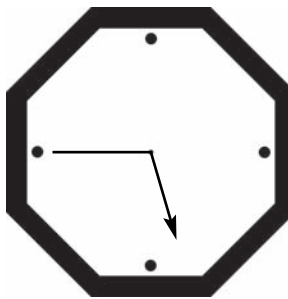
a)



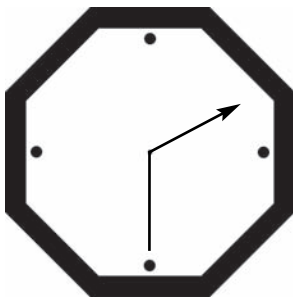
b)



c)



d)



3. Write these times in analogue form ('minutes past' or 'minutes to').

a) 3.20 _____

b) 12.10 _____

c) 9.04 _____

d) 2.50 _____

Skills
Write times in 12 and 24-hour format. Calculate times.

What time is it? (cont'd)

4. Write these times in digital form.

- | | | | |
|----------------------|----------------------|--------------|----------------------|
| a) 10 minutes past 4 | <input type="text"/> | b) 25 past 3 | <input type="text"/> |
| c) 5 minutes to 9 | <input type="text"/> | d) 20 to 1 | <input type="text"/> |

If you have tried to program a video or DVD recorder, you will have used 24-hour time. This method of recording the time uses a 24-hour cycle where 12 is added to all the hours after midday (noon). All times are recorded using four digits. There is no need to use am or pm to indicate morning or evening. For example, 1 pm becomes 1300 hours, 3.30 pm becomes 1530 hours, midday or 12 noon is 1200 hours and midnight is 0000 hours.

5. Write these times in 24-hour time.

- | | | | |
|-------------|----------------------|------------|----------------------|
| a) 10.30 am | <input type="text"/> | b) 2.15 pm | <input type="text"/> |
| c) 7.10 am | <input type="text"/> | d) 6.40 pm | <input type="text"/> |

6. Change these times to 12-hour time, using am or pm to indicate morning or afternoon.

- | | | | |
|---------------|----------------------|---------------|----------------------|
| a) 1015 hours | <input type="text"/> | b) 0230 hours | <input type="text"/> |
| c) 1410 hours | <input type="text"/> | d) 2020 hours | <input type="text"/> |

7. Complete the 24-hour times for the DVD recorder settings.

Television programme times	DVD setting
From 9 am to 11.30 am	On at ____ hours. Off at ____ hours.
From 2.30 pm to 4 pm	On at ____ hours. Off at ____ hours.
From midday to 2.55 pm	On at ____ hours. Off at ____ hours.
From 7.30 pm to 9.45 pm	On at ____ hours. Off at ____ hours.

8. What is the time:

- | | |
|--|----------------------|
| a) 5 hours after 11 am? | <input type="text"/> |
| b) 4 hours before 7pm? | <input type="text"/> |
| c) 3 hours and 15 minutes after 2.30 pm? | <input type="text"/> |
| d) 2 hours and 10 minutes before 8 pm? | <input type="text"/> |
| e) 7 hours after 0900 hours? | <input type="text"/> |
| f) 9 hours before 1730 hours? | <input type="text"/> |
| g) 5 hours 30 minutes after 1025 hours? | <input type="text"/> |
| h) 3 hours and 30 minutes before 1300 hours? | <input type="text"/> |

What time is it? (cont'd)

9. What is the difference in time, in hours and minutes, between:

a) 7.20 am and noon?

b) 8 am and 4.30 pm?

c) 9.20 am and 2.30 pm?

d) 0530 hours and 1200 hours?

e) 0815 hours and 1700 hours?

f) 1750 hours and 0000 hours?

10. Sophie is baking a fruit loaf. She put it in the oven at 2.35 pm to bake for 45 minutes. At what time should it be ready to remove from the oven?

11. Hiro is cooking a beef pot roast. The total cooking time is 2 hours and 40 minutes. He starts cooking the meat at 4.15 pm. At what time should it be ready?

12. Michael is roasting a leg of lamb. He needs to roast it for a total of 1 hour and 25 minutes. He puts it in a heated oven at 5.30 pm. At what time should it be cooked?

13. This is part of a morning bus timetable.

Depart Littleport	Marham	Necton	Arrive Feltwell train station
7.11	7.27	7.37	7.44
7.51	8.07	8.17	8.24
8.16	8.32	8.42	8.49
8.36	8.52	9.02	9.09
9.36	9.52	10.02	10.09

a) How long is the bus trip from Littleport to Feltwell station if the bus departs Littleport at 7.11 am?

b) Devon lives at Littleport and needs to catch a train leaving Feltwell station at 8.45 am. What is the latest time he can catch a bus from Littleport to Feltwell station, to catch his train?

c) Maria missed the 7.51 bus from Littleport by five minutes. How long will she have to wait for the next bus to Marham?

Taking medicines

A packet of paracetamol tablets (for the temporary relief of headaches and pain) contained the following information.

Contents: 24 tablets Each tablet contains paracetamol 500 mg		
Age	Number of tablets	How often?
7–12 yrs	1	Every 4 to 6 hours with water as required (Maximum 4 tablets in 24 hours)
12 yrs – Adult	2	Every 4 to 6 hours with water as required (Maximum 4 tablets in 24 hours)

Store below 25°C

1. How many tablets does this packet contain?

2. What is the dose for:

a) an adult?

b) an 18 year-old?

c) a 9 year-old boy?

d) an 11 year-old girl?

A bottle of cough medicine has the following information printed on its label.

FLAVOURED COUGH MEDICINE 100ml <i>Suitable for all the family</i>
Dosage Adults and children over 12 years – 10 ml Children aged 6 to 12 years – 5 ml Children aged 2 to 6 years – 2.5 ml
Dose to be taken every 4 hours Store below 30°C

3. How many millilitres of medicine are in this bottle?

4. In millilitres, what is the dose for:

a) an adult?

b) a 15 year-old?

c) a 10 year-old?

d) a 5 year-old?

5. In a full bottle, how many 10 ml doses are there?

Taking medicines (cont'd)

- 6. In a full bottle, how many children's doses (6 to 12 years) are there?
- 7. How often should a dose of this medicine be taken?
- 8. How many times can a dose be taken in one day?
- 9. How long would a bottle last a 16 year-old who takes the maximum dosage each day?

The Kim family is going on holiday. Their doctor advised them to take tablets to help prevent malaria. The packet contains the following information.

Contents: 100 tablets
<p>Dosage</p> <p>Adults - 2 tablets daily</p> <p>Children:</p> <p>Over 14 years — adult dose</p> <p>9 to 14 years — 1½ tablets daily</p> <p>5 to 8 years — 1 tablets daily</p> <p>1 to 4 years — ½ tablet daily</p>
<p><i>Take with some water, after meals at the same time each day.</i></p>

- 10. What dosage should Mr and Mrs Kim each take?
- 11. What dosage is suitable for Quan who is 17 years old?
- 12. What dosage is suitable for Mai who is 13 years old?
- 13. The family will be away for ten days. Their doctor told them to start taking the tablets the day before they leave home and then take them daily until and including the 7th day after they return home. Does this packet contain enough tablets for all four members of the family?

Taking medicines (cont'd)

Various formulae are used for calculating the required dose of a medicine for children and infants. Two of these rules are based on the child's age.

Fried's rule:

$$\text{Dosage} = \frac{\text{age of the infant in months} \times \text{adult dosage}}{150}$$

Young's rule:

$$\text{Dosage} = \frac{\text{age of the child in years}}{\text{age of the child} + 12} \times \text{adult dosage}$$

14. The adult dosage of a medicine is 15 ml. Use Fried's rule to calculate the dosage for infants of these ages:

a) 10 months old

b) 15 months old

c) 20 months old

d) 2 years old

15. The adult dose of a medicine is 20 ml. Use Young's rule to calculate the dosage for these children:

a) 8 years old

b) 3 years old

c) 4 years old

d) 12 years old

16. A child is 4 years old. What fraction of the adult dosage of a medicine would be given to this child using Fried's rule?

17. How old would a child be to get the full adult dosage according to Fried's rule?

18. A child is 8 years old. What fraction of the adult dosage of a medicine would be given to this child using Young's rule?

19. How old would a child be to get half of the adult dosage of a medicine according to Young's rule?

Running a car – petrol consumption and cost

The amount of petrol used by a car is generally expressed as a rate of miles per gallon (mpg). To work out the amount of petrol a car will use to travel a certain distance, you need to carry out the following sum:

Example: A car uses petrol at a rate of 35 mpg.
To travel 385 miles, this car uses $385 \div 35 = 11$ gallons

1. A car uses petrol at a rate of 38 mpg. How many gallons of petrol would it use to travel 480 miles?
2. A car uses petrol at a rate of 29 mpg. How many gallons of petrol would it use to travel 650 miles?
3. A car uses petrol at a rate of 27 mpg. How many gallons of petrol would it use to travel 650 miles?
4. A car uses petrol at a rate of 41 mpg. How far can it travel on 7.5 gallons of petrol?
5. A car uses petrol at a rate of 26 mpg. How far can it travel on 11.9 gallons of petrol?
6. A car uses petrol at a rate of 31 mpg. How far can it travel on 18.5 gallons of petrol?

To work out the average rate of petrol consumption you need to carry out the following sum:

Example: A car travels 342 miles using 8.7 gallons of petrol.
The average rate of petrol consumption is $342 \div 8.7 = 39$ mpg

7. A car travels 215 miles using 6 gallons of petrol. Express the average rate of petrol consumption in miles per gallon.
8. The following table shows the amount of petrol used and the distance travelled during one week for five different cars. Calculate the rate of fuel consumption for each car, expressed in miles per gallon. Write your answers in the second column of the table.

	Rate of fuel consumption
Car A used 9 gallons to travel 248 miles.	
Car B used 7.3 gallons to travel 217 miles.	
Car C used 12.4 gallons to travel 310 miles.	
Car D used 15.68 gallons to travel 360 miles.	
Car E used 12.05 gallons to travel 391 miles.	

16 Running a car – petrol consumption and cost (cont'd)

Skills

Calculate fuel costs. Make petrol consumption/price comparisons.

In Britain we measure fuel consumption in miles per gallon, but we price and buy petrol in litres. One gallon is approximately 4.5 litres.

To work out the cost of petrol you need to carry out the following sum.

Example: Petrol costs 94.7 pence per litre.

What is the cost of 38.7 litres of petrol?

94.7 pence = £0.947 (Use this so your answer will be in pounds and pence.)

Cost of petrol = £0.947 × 38.7

= £36.65 (to the nearest pence)

9. If petrol costs 95.9 pence per litre, what is the cost (in pounds and pence) of these quantities of petrol? (Answer to the nearest pence.)

a) 30 litres

b) 47 litres

c) 42.5 litres

d) 54.3 litres

e) 38.65 litres

f) 62.18 litres

10. For each amount, work out how many litres of petrol have been purchased at 93.8 pence per litre. Answer correct to two decimal places.

a) £28.00

b) £43.00

c) £37.60

d) £54.25

e) £32.85

f) £45.53

11. The petrol consumption of four popular small cars was tested. The results were:

	Petrol cost
Car A used an average of 40 mpg	
Car B used an average of 34 mpg	
Car C used an average of 30 mpg	
Car D used an average of 26 mpg	

If petrol costs 94.3 pence per litre, how much would the petrol cost for each car to travel 300 miles? (Remember: 1 gallon = 4.5 litres.) Calculate each answer to the nearest pence. Write your answers in the second column of the table.

Running a car – petrol consumption and cost (cont'd)

12. In planning a trip from Plymouth to Edinburgh and back (a distance of 974 miles), Paul and Lesley are considering whose car to use.

- Paul's car uses petrol at an average rate of 26 mpg.
- Lesley's car uses petrol at an average rate of 34 mpg.

a) How much more petrol would Paul's car use for this trip than Lesley's car? (Answer in gallons.)

b) They decided to take Lesley's car and leave Paul's car at home. If the average cost of petrol for the journey was 94.4 pence per litre, how much did they save by taking Lesley's car?

13. It is estimated that the average motorist travels about 10,000 miles per year. What would be the average yearly petrol bill for these cars at a rate of 95.6 pence per litre? Calculate each answer to the nearest pence. Write your answer in the second column of the table.

	Average yearly petrol bill
Car A uses an average of 40 mpg.	
Car B uses an average of 34 mpg.	
Car C uses an average of 30 mpg.	
Car D uses an average of 26 mpg.	
Car E uses an average of 25 mpg.	

14. A driver estimates that he will travel 18,000 miles in a year. He is calculating his possible fuel costs for two different cars:

- Car A uses petrol at an average rate of 33 mpg.
- Car B uses petrol at an average rate of 26 mpg.

a) How many litres of petrol would he use in one year with each car?

b) How much less petrol would he use in one year if he purchased Car A rather than Car B?

c) The average cost of petrol is 93.9 pence per litre. How much will he save in petrol costs if he purchases Car A?

Owning a car

Adi has succeeded in passing his driving test. He has a part-time job at Peter's Pizza Place and believes he can afford to buy and run his own car. He has seen a car that he would like to buy and his mother has told him to consider all the costs of running a car as well as how much it will cost him to buy the car.

1. Certain expenses associated with owning a car are payable every year. Adi's mother has told him to include:

- Road tax £120.00
- Car insurance £659.00
- MOT £53.10

a) Add these amounts to find the total of the annual expenses.

b) Divide this total by 52 to calculate the average cost of the expenses per week. (Answer to the nearest pence.)

2. In addition to these annual costs, there are running costs such as the cost of petrol, repairs and regular maintenance. Adi has estimated that breakdown cover will cost him £45 per year and that in one year his car will require one service costing £150. He also allows for two new tyres each year (£60 each) and a further £120 for other repairs.

a) What is the total amount that Adi has estimated for new tyres each year?

b) What is the total amount that Adi has estimated for his annual running costs (excluding petrol)?

c) What is the average weekly cost of these expenses? (Answer to the nearest pence.)

3. Adi estimates that he will drive an average of 165 miles per week in his car. If his car has an average rate of petrol consumption of 34 mpg, how much petrol, in litres, will he need to buy (on average) each week? (Remember: 1 gallon = 4.5 litres)

4. Adi noted that the average cost of petrol in the past year was 94.3 pence per litre. What is the average cost of the petrol Adi will need each week? (Answer to the nearest pence.)

5. Using your answers for questions 1. b), 2. c) and 4. above, calculate Adi's average weekly cost of running a car.

6. Adi has seen a used car he wants to buy, priced at £3,895. He has saved £1,879 towards the cost of the car. His parents have offered to lend him the balance to pay for it.

a) How much will Adi need to borrow from his parents?

b) How long will it take Adi to repay the loan if he pays his parents £50 each week?

Owning a car (cont'd)

7. Adi earns £198.58 per week after tax has been deducted.

a) Does Adi earn enough from his job to cover the average weekly cost of running a car and the repayment to his parents?

b) How much will he have to spend on other things?

Keisha purchased a car costing £9,200. Here are the costs she had during the first year.

Loan repayment	£155.60 per month
Petrol	£24.83 per week (average)
Car insurance	£623.00
Road tax	£120.00
<u>Repairs and maintenance</u>	
MOT	£53.10
Two new tyres	£120.00
Windscreen repair	£75.00
Service	£140.00

8. What is the total cost during the first year for Keisha's car?

9. Keisha drove 16,500 miles during the year. Find the average cost per mile of running her car. (You will need to divide the total cost by 16,500.)

10. At the end of the year, Keisha needed to replace the other two tyres on her car. She decided to replace the tyre on the spare wheel in the boot too. She was offered the same price per tyre as she paid during the year. How much will these three new tyres cost?

11. When Keisha paid her annual car insurance, the insurance company had given her a 20% no-claims discount because she had not made a claim in the previous year. What would the insurance premium have been without the no-claims discount?

12. Keisha estimates that her car will depreciate in value by 20% each year.

a) What is the loss in value (depreciation) during the first year?

b) What is her car's value at the end of the first year?

c) Calculate the loss in value during the second year. (This is 20% of the car's value at the end of the first year.)

d) What is the car's value at the end of the second year?

e) Calculate the loss in value during the third year.

f) What is the car's value at the end of the third year?

Breakfast

The nutrition information from two packages of breakfast cereal is shown below.

WHEAT BRITS Nutrition information (average) Serving size - 30 g (2 biscuits) Servings per pack - 12			
	Per serving	Per 100 g	30 g with 160 ml milk
Energy (kcal)	107	356	218
Protein (g)	3.7	12.4	9.2
Fat - Total (g)	0.4	1.4	6.8
- Saturated (g)	0.1	0.3	4.3
Carbohydrate - Total (g)	20.1	67	27.9
- Sugars (g)	1.0	3.3	8.8
Dietary fibre (g)	3.3	11.0	3.3
Sodium (mg)	87	290	155
Potassium (mg)	102	340	355
Zinc (mg)	1.8 (15% RDI)	6	2.5
Iron (mg)	3.0 (25% RDI)	10.0	3.2
Magnesium (mg)	32 (10% RDI)	107	50
Thiamin (mg) (Vitamin B1)	0.55 (50% RDI)	1.83	0.63

KRISPY FLAKES Nutrition information (average) Servings per package - 10 Average serving size - 30 g				
	Quantity per serving	% daily intake per serving	Per serve with 120 ml skimmed milk	Quantity per 100 g
Energy	112 kcal	5.6%	158 kcal	378 kcal
Protein	2.3 g	4.7%	7 g	7.8 g
Fat				
- Total	< 0.1 g	0.1%	0.2 g	0.2 g
- Saturated	< 0.1 g	0.1%	0.1 g	< 0.1 g
Carbohydrate				
- Total	25.1 g	8.1%	31.6 g	83.6 g
- Sugars	2.4 g	2.6%	8.8 g	7.9 g
Dietary fibre	0.8 g	2.6%	0.8 g	2.6 g
Sodium	216 mg	9%	273 mg	720 mg
Potassium	28 mg	-	234 mg	93 mg
Thiamin (Vit. B1) (% RDI)	0.28 mg (25%)	-	0.33 mg (30%)	0.92 mg (83%)
Riboflavin (Vit. B2) (% RDI)	0.4 mg (25%)		0.7 mg (40%)	1.4 mg (83%)

Breakfast (cont'd)

1. For a 30 g serving, which cereal (Krispy Flakes or Wheat Brits) provides more:

a) protein?

b) carbohydrate?

c) dietary fibre?

d) sodium?

e) thiamin?

2. Calculate the percentage of dietary fibre in 100 g of each cereal.

a) Krispy flakes

b) Wheat Brits

3. Calculate the percentage of carbohydrate in 100 g of each cereal.

a) Krispy flakes

b) Wheat Brits

4. What percentage of each cereal is sugar?

a) Krispy flakes

b) Wheat Brits

5. For a 30 g serving, which cereal provides the lower amount of:

a) fat?

b) sugars?

6. Tia has two Wheat Brits and 160 ml of milk for breakfast each morning. How much energy (how many calories) does this provide?

7. How many servings of Wheat Brits with milk does the manufacturer suggest are required to meet the average female adult diet of 2000 kcal per day?

8. Amy has 30 g of Krispy Flakes and 120 ml of skimmed milk at breakfast each morning.

a) How much energy does this provide?

b) How much carbohydrate does this provide?

9. Nicky has three servings of Wheat Brits (six biscuits and 480 ml of milk) for breakfast.

a) How much energy does this provide?

b) How much dietary fibre does this provide?

Breakfast (cont'd)

The nutrition information from a bread packet and a carton of fruit drink are shown below.

Farmhouse sliced bread Nutrition Information Servings per package: 9 (16 slices and 2 crusts) Serving size: 72.5 g (2 slices)		
	Quantity per serving	Quantity per 100 g
Energy	188 kcal	234 kcal
Protein	5.8 g	8.0 g
Fat - Total	1.8 g	2.5 g
- Saturated	<1 g	<1 g
Carbohydrate - Total	32.7 g	45.1 g
- Sugars	1.9 g	2.6 g
Dietary fibre	2.2 g	3.0 g
Sodium	325 mg	450 mg

Tropical fruit drink Nutrition information Servings per pack: 10 Serving size: 200 ml		
Average quantity	Per serving	Per 100 ml
Energy	86 kcal	43 kcal
Protein	< 1 g	< 1 g
Fat - Total	< 1 g	< 1 g
- Saturated	0 g	0 g
Carbohydrate - Total	20.4 g	10.2 g
- Sugars	20.0 g	10.0 g
Vitamin C	20 mg (50% RDI)	10 mg
Sodium	6 mg	3 mg

10. A serving of two slices of bread provides how much:

a) carbohydrate?

b) dietary fibre?

c) protein?

d) energy?

11. Jake usually eats six slices of bread each day. This provides him with how much:

a) carbohydrate?

b) energy?

12. A serving of 200 ml of tropical fruit drink provides how much:

a) carbohydrate?

b) sugars?

c) vitamin C?

d) energy?

13. Sarah usually drinks 500 ml of this fruit drink each day. This provides her with how much:

a) sugar?

b) energy?

c) vitamin C?

14. Yesterday, Peter had four Wheat Brits with milk for breakfast. He had two sandwiches (four slices of bread) and 300 ml of fruit drink for lunch. In these two meals, how much:

a) carbohydrate has he consumed?

b) sodium has he consumed?

15. The recommended dietary intake of sodium for a teenager or adult is less than 2400 mg per day. What percentage of the recommended maximum dietary intake of sodium has Peter consumed in the two meals in question 14?

In the kitchen

A recipe lists the ingredients for making a certain amount of food. The number of servings is usually listed too. A cook must work out the correct amount of each ingredient to feed the number of people and avoid wastage.

Rice pudding	(serves 4)
40 g rice	600 ml milk
20 g sugar	pinch of salt

1. When preparing a rice pudding for 8 people:

a) how much rice should be used?

b) how much milk should be used?

2. When preparing a rice pudding for 6 people:

a) how much sugar should be used?

b) how much milk should be used?

Scones	(makes 12)
300 g self-raising flour	1 teaspoon sugar 30 g butter
$\frac{1}{2}$ teaspoon salt	125 ml milk 60 ml water

3. To make 24 scones:

a) how much flour would you need?

b) how much butter would you need?

c) how much milk would you need?

4. To make 18 scones:

a) how much flour would you need?

b) how much butter would you need?

Toffee apples	(makes 10)
10 green apples	100 ml liquid glucose
10 butcher's skewers	880 g sugar
250 ml water	

5. To make 20 toffee apples:

a) how much sugar would you need?

b) how much liquid glucose would you need?

In the kitchen (cont'd)

6. To make 15 toffee apples:

a) how much sugar would you need? b) how much water would you need?

Pancakes	(makes 6)
75 g plain flour	180 ml milk
2 eggs	pinch salt
2 teaspoons oil	

7. To make 12 pancakes:

a) how many eggs would you need? b) how much flour would you need? c) how much milk would you need?

8. To make 18 pancakes:

a) how much flour would you need? b) how much milk would you need?

Chicken Maryland	(serves 6)
6 chicken maryland pieces	6 pineapple rings
6 bananas	60 ml milk
40 g flour	6 corn on the cobs
3 eggs	salt, pepper
	dry breadcrumbs
	3 rashers bacon
	3 ripe tomatoes

9. a) How many chicken pieces would you need to cook for eight people?

b) How many bananas would you need to cook for four people? c) How many eggs would you need to cook for two people? d) How much milk would you need to cook for 12 people?

Home-baked brown bread	(makes 4 loaves)
350 g white flour	1 teaspoon salt
30 g yeast	375 ml water
750 g wholemeal flour	60 g sugar
375 ml milk	

10. To make two loaves:

a) how much white flour would you need? b) how much yeast would you need?

In the kitchen (cont'd)

11. To make eight loaves:

a) how much wholemeal flour would you need?

b) how much milk would you need?

12. Shaun used 45 g yeast when making some bread. How many loaves was he going to bake?

OVEN TEMPERATURE

Have you ever looked at old recipe books? The cooking temperatures in many older cookbooks are given in degrees Fahrenheit. If you are going to use these recipes, you will need to convert the temperatures to degrees Celsius.

13. Use the conversion formula $C = \frac{5}{9}(F - 32)$ to convert these temperatures from degrees Fahrenheit to degrees Celsius. Answer to the nearest degree.

a) 500°F

b) 450°F

c) 400°F

d) 300°F

ROAST BEEF – A HANDY FORMULA

The time for which a piece of beef should be roasted depends on its mass and the temperature of the oven. If the oven temperature is kept constant at 200°C then the formula connecting cooking time and the mass is shown in the box below.

$$t = 40 \times (m + 0.5)$$

where t is the cooking time in minutes and m is the mass of the beef in kilograms.

For example, if a piece of beef has a mass of 2.5 kg, the cooking time is

$$t = 40 \times (2.5 + 0.5) = 120 \text{ minutes or } 2 \text{ hours}$$

14. Calculate the cooking time for a piece of beef with mass:

a) 2 kg

b) 1.5 kg

c) 2¼ kg

15. Katie cooked a piece of beef for 2 hours and 20 minutes (140 minutes) in an oven at 200°C. If the beef was perfectly roasted at the end of this time, what was its mass?

16. Andrew followed a recipe and cooked a piece of beef in an oven at 200°C for 2½ hours. What was the mass of this piece of meat?

Take-away food

Town Centre Take-away	
Plain beefburger	£2.75
Cheeseburger	£3.15
Cheeseburger with bacon	£3.75
Whopper burger (the works)	£4.55
Egg and bacon bap	£2.25
Chicken burger	£3.25

1. Christie ordered a cheeseburger with bacon and a drink costing £1.45 at the Town Centre Take-away.

a) What is the total of her order?

b) How much change will she receive from £10?

2. Kirsty ordered a Whopper burger, chips which cost £1.10 and a drink costing £1.25.

a) What is the total of her order?

b) How much change will she receive from £10?

3. Alex ordered a plain beefburger, chips which cost £1.10 and a drink costing £1.45.

a) What is the total of his order?

b) How much change will he receive from £10?

4. Darren ordered two egg and bacon baps, chips which cost £1.10 and a drink costing £1.45.

a) What is the total of his order?

b) How much change will he receive from £20?

5. The Green family ordered a meal from The Town Fryer restaurant. They ordered five pieces of fish costing £2.20 each and three large portions of chips costing £1.75 each.

a) What is the total cost of their order?

b) How much change will Mrs Green receive from £20?

Take-away food (cont'd)

Peter's Pizza			
	Small	Medium	Large
Margarita	£3.50	£5.50	£7.50
Vegetarian	£3.50	£5.50	£7.50
Pepperoni	£3.99	£5.99	£7.99
Hawaiian	£3.99	£5.99	£7.99
American Hot	£3.99	£5.99	£7.99
Supreme	£4.99	£6.99	£8.99

6. Jodie purchased a small American Hot pizza from Peter's pizza shop. How much change will she receive from £10?
7. Dennis ordered two pizzas from Peter's Pizza shop, a medium Hawaiian and a small Supreme.
- a) What is the total cost of his order?
- b) How much change will Dennis receive from £20?
8. Nick placed an order for home delivery with Peter's Pizza shop. He ordered three pizzas: a large Supreme, a large vegetarian and a medium Pepperoni.
- a) What is the total of his order?
- b) How much change will Nick receive from £30?
- c) The delivery driver only carries £20 in change. Will this be enough to give Nick his change from £30?
9. Talia ordered take-away from the local Chinese restaurant. She ordered a serving of sesame prawn toast (£4.00), satay beef (£5.45) and fried rice (£2.10). What is the total cost of Talia's order?
10. Lauren decided to order a meal to take home for her family from her local Chinese restaurant. She ordered four spring rolls (£0.90 each), six crisp wantons (£2.80 for six), two portions of beef with black bean sauce (£4.30 each), two portions of sweet and sour chicken (£4.90 each), two portions of chilli king prawns (£5.80 each) and three portions of fried rice (£2.10 each).
- a) What is the total cost of Lauren's order?
- b) The restaurant gives a 10% discount on all take-away orders. How much will they take off Lauren's bill?
- c) How much will Lauren pay?

Take-away food (cont'd)

Thai Tanic Restaurant – Chef's suggestions	
Fish cakes	£1.95 each
Crispy prawns	£1.45 each
Siam Duck	£8.95
Tiger Tear (beef salad)	£7.95
Chicken Pad Khing	£7.50
Exotic seafood platter	£22.00

11. Cheryl placed the following order at the local Thai Tanic restaurant: three crispy prawns, a portion of chicken pad khing and a small steamed rice (£2.50).

a) What is the total cost of Cheryl's order?

b) How much change will she receive from £20.00?

12. Sean ordered take-away from the local Thai Tanic restaurant. He ordered:

- 4 crispy prawns
- 4 fish cakes
- a portion of Siam duck
- a portion of a beef curry (£6.95)
- steamed rice (£2.50)

a) What is the total cost of Sean's order?

b) Sean presented a discount voucher, giving him a 20% discount on the total order. How much will they take off Sean's bill?

c) How much will Sean pay?

Going shopping

Supermarkets often advertise 'multi-buys', where you save by buying two or more of the same item.

1. How much will you save if you purchase these multi-buys?

a) 2 litre bottle of soft drink: £1.56 each or two for £2.68.

b) biscuits: £1.38 per packet or three packets for £3.60.

c) facial tissues: £1.31 per box or two boxes for £2.38.

d) crumpets: £0.57 per pack or three packs for £1.50.

e) bread: £1.29 per loaf or two loaves for £2.00.

f) packet noodles: £0.50 per packet or three packets for £1.20.

When purchasing a number of items, a shopper should always be careful that:

- they have enough money to pay for the total amount
- the total is correct (either estimate the total or add up the cost of the items)
- the correct change is given when paying cash.

2. Calculate the total cost of these shopping lists, and decide if £10 is enough to pay the full amount.

a)

1 bottle of orange drink	£1.36
1 packet tortilla chips	£0.87
1 jar salsa dip	£0.88
1 packet crisps	£1.12
1 frozen pizza	£1.29
1 granary loaf	£1.48

b)

2 bottle lemonade	£0.97 each
2 packets biscuits	£0.89 each
3 packs yoghurts	£1.49 each
1 jar strawberry jam	£1.89
1 container ice-cream	£1.41
1 packet cereal	£1.74

Going shopping (cont'd)

3. Calculate the total cost of these shopping lists, and decide the change when £40 is given in payment.

a)

1 packet cereal	£1.89
4 cans soup	£0.81 each
1 bottle tomato sauce	£1.63
2 packs sultanas	£1.28 each
3 packs biscuits	£0.91 each
1 jar coffee	£2.63
500g lamb chops	£12.98 per kg

b)

1 loaf bread	£0.89
1 pack teabags	£3.55
2 packs yoghurt	£1.58 each
2 litre tub ice-cream	£2.14
1 pack dishwasher tabs	£3.49
1 can deodorant	£2.38
1 whole chicken	£5.75

c)

1 bottle shampoo	£1.84
1 bottle conditioner	£2.14
2 boxes tissues	£1.31
500g steak	£10.26 per kg
500g grapes	£3.00 per kg
1.5kg apples	£1.58 per kg
500g tomatoes	£1.78 per kg
1 pack cheese	£2.76
1 pack washing powder	£5.18

d)

1 pack pasta	£1.24
1 jar pasta sauce	£1.08
1 carton orange juice	£1.49
500g minced beef	£4.40 per kg
250g sliced ham	£12.00 per kg
1.5kg bananas	£0.72 per kg
500g apples	£1.58 per kg
1 tube toothpaste	£2.44
2 toothbrushes	£1.95 each



Best buy or deal

When you go shopping, a single product is often sold in containers of different sizes at different prices. To find out which size is the better buy, we compare the cost for equal quantities.

Example: Two different size bottles of the same soft drink are available: 1.25 litres for £0.95 and 2 litres for £1.37. Which is the better buy?

The 1.25 litre bottle costs $£0.95 \div 1.25 = £0.76$ per litre

The 2 litre bottle costs $£1.37 \div 2 = £0.685$ per litre (Do not round the answer!)

The 2 litre bottle costs less per litre and is therefore the better buy.

1. Farmer's Blend ice-cream is sold at the local supermarket in two sizes.

a) A 2-litre container costs £2.41. What will you pay for 1 litre of ice-cream if you buy this container?

b) A 5-litre container costs £4.22. What will you pay for 1 litre of ice-cream if you buy this container?

c) Which is the better buy?

2. Kenyan Special Roast instant coffee is available in three sizes.

a) A 50g jar costs £2.05. What will you pay for 1g of coffee if you buy this jar?

b) A 200g jar costs £4.97. What will you pay for 1g of coffee if you buy this jar?

c) A 300g jar costs £7.61. What will you pay for 1g of coffee if you buy this jar?

d) Which is the best buy?

3. Farm Fresh orange and mango drink is sold in 2-litre cartons costing £1.94 and 3-litre cartons costing £4.74. Which is the better buy?

4. Which is the better buy?

a) milk chocolate: a 250g bar for £3.40 or a 100g bar for £1.05?

b) pasta sauce: a 500g jar for £1.39 or a 750g bar for £2.12?

c) biscuits: a 300g packet for £0.96 or a 400g packet for £1.26?

d) breakfast cereal: a 375g packet for £2.66 or a 750g packet for £2.89?

e) baked beans: a 200g tin for £0.47 or a 415g tin for £0.74?

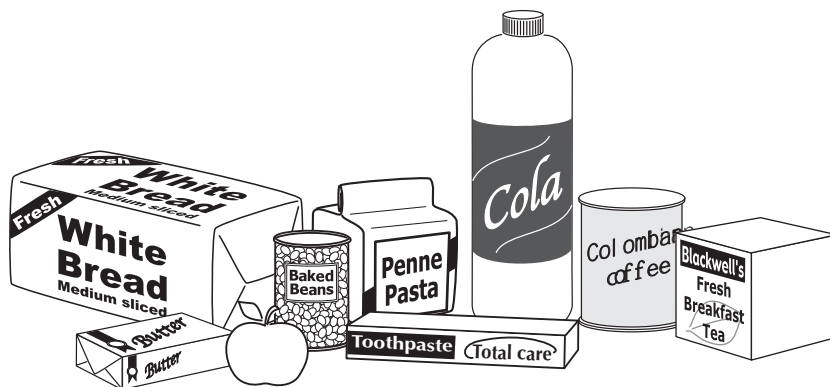
Skills
 Make calculations involving money. Compare prices. Calculate best buys.

Best buy or deal (cont'd)

5. Ham is advertised for sale at the local supermarket for £7.90 per kg. A 250g pack is priced at £4.55. Which is the better buy?
6. Orange squash is sold in two sizes. A 750ml bottle is advertised for £0.95 and a 3-litre bottle is advertised for £2.93. Which is the better buy?
7. Crispy Chicks sell take-away chicken pieces in a range of packs.

Type of pack	Number of pieces	Cost of the pack	Cost per piece
Snack pack	3	£2.76	
5 piece feed	5	£4.35	
Value pack	8	£6.23	
Family pack	10	£7.95	
Party bucket	16	£9.27	

- a) Calculate the cost per piece for each pack to the nearest pence. Write your answers in the last column of the table.
- b) Which pack is the most expensive per piece?
- c) Which pack is the cheapest per piece?
- d) Liam buys two Party buckets and a Family pack. How much does this cost?



Sportymart Sun and Surf brochure

Sportymart issued a Sun and Surf advertising brochure. It advertised the specials and savings shown below.

Surfboard	£225.00	Save £20.00
Bodyboard	£39.99	Save £30.00
Skimboard	£34.50	Save £10.00
Surf mat	£23.50	Save £10.00
Summer wetsuit	£95.00	Save £30.00
Boardshorts	£29.99	Save £10.00
Rash vest	£11.99	Save £15.00
Flip flops	£14.99	Save £5.00

1. Jay purchased a surfboard, a wetsuit and a pair of boardshorts at the prices advertised.

a) What was the total cost of the items he purchased?

b) What was the total amount he saved?

2. What was the original price of:

a) the surfboard

b) the bodyboard

c) the summer wetsuit

d) the rash vest

e) the boardshorts

f) the surf mat?

3. a) What was the original price of the skimboard?

b) Express the saving as a percentage of the original price.

4. For each of these items, express the advertised saving as a percentage of the sale price shown in the brochure. Answer correct to 1 decimal place.

a) the surfboard

b) the bodyboard

c) the summer wetsuit

d) the rash vest

e) the boardshorts

f) the surf mat?

Sportymart Sun and Surf brochure (cont'd)

Skills

Make calculations involving money. Calculate prices after discounts. Calculate percentages.

5. For each of these items, express the advertised saving as a percentage of the original price. Answer correct to 1 decimal place.

a) the surfboard

b) the bodyboard

c) the skimboard

d) the boardshorts

e) the flip flops

f) the surf mat

6. A bodyboard package deal was advertised in the Sportymart Sun and surf brochure. It consisted of a bodyboard, a pair of fins, a wrist coil and sock cover. The advertised price is £199, a saving of £50.

a) What was the original price of the total package?

b) Express the savings as a percentage of the original price, correct to 1 decimal place.

c) Express the saving as a percentage of the advertised price, correct to 1 decimal place.

7. A snorkelling package was advertised in this brochure. It consisted of a mask and snorkel, a pair of fins, and a pair of diver's boots. The advertised price was £49, a saving of £26.

a) What was the original price of the total package?

b) Express the savings as a percentage of the original price, correct to 1 decimal place.

c) Express the saving as a percentage of the advertised price, correct to 1 decimal place.

8. The individual items in the snorkelling package were also advertised separately in the same brochure, as shown below.

Diver's Mask	£39.95
Diver's fins	£39.48
Snorkel	£23.48
Diver's boots	£24.35

a) What is the total price of the individual items?

b) Is the advertised saving of purchasing the snorkelling package correct?

Sports sale

1. The new cricket season is about to start and Ben needs some new gear. Ben checked the prices of new cricket gear. The normal prices are shown in this table.

Cricket bat	£249.95
Batting gloves	£54.95
Kit bag	£79.95
Batting leg guards	£59.95
Shoes	£39.95
Helmet	£34.95

The local Sportymart store is having a sale.

- a) The bat, leg guards and gloves are advertised on sale at a discount of 20% off the normal price. What is the discounted price of each item?

- b) The kit bag is advertised for £69.95, £10 off the normal price. What is the percentage discount?

- c) The shoes are advertised for £25.95. What is the percentage discount?

- d) If Ben buys the new bat, leg guards, gloves, shoes and kit bag at the Sportymart sale, what is the total amount that he will pay? How much does he save off the normal prices?

2. Pam plays hockey for a local team. She needs a new stick and a new pair of hockey shoes.

- a) Sportymart advertised a stick at £60, a saving of 20% off the normal price. What was the normal price of the stick?

- b) The hockey shoes Pam wanted were priced at £64, 25% off the normal price. What was the normal price of the shoes?

3. Chris plays competitive tennis. He saw a new tennis racquet, normally priced at £149.99, discounted by £40.

- a) What is the discounted price?

- b) Express the discount as a percentage of the normal price. Answer to 1 decimal place.

Sports sale (cont'd)

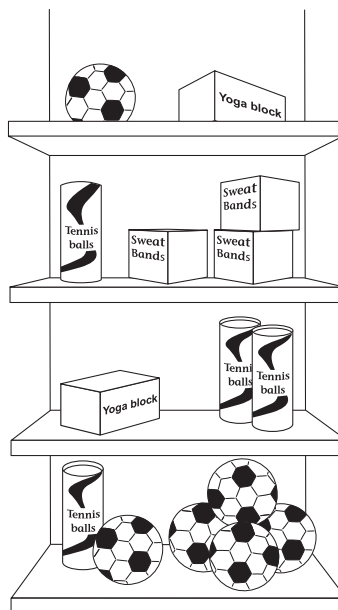
4. Jess bought a new pair of tennis shoes, normally priced at £79.99. The price of the shoes was reduced to £69.99. Express the discount as a percentage of the normal price.

5. Theo saw a pair of running shoes, normally priced at £124.95, advertised for £89.99 at his Sportymart store.
 - a) How much are the shoes reduced by?
 - b) Express the discount as a percentage of the normal price.

6. A set of golf clubs, normally priced at £399, was advertised at 30% off the marked price.
 - a) How much are the clubs reduced by?
 - b) What is the discount price of the golf clubs?

7. Nikki purchased a pair of netball shoes for £39.95. The price had been discounted by 15%. What was the original price of the shoes (to the nearest pence)?

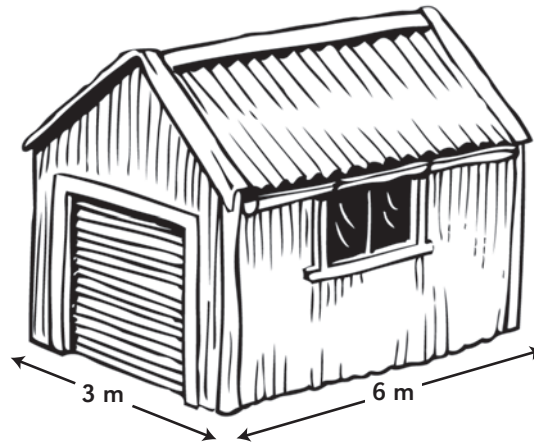
8. Caitlin wanted a new bodyboard, normally priced at £69.99. Sportymart advertised a 40% discount on all bodyboards in their store. How much will Caitlin pay for the bodyboard (to the nearest pence)?



Building a shed

Grace is a carpenter and decided to build a shed in her back garden.

Work through the following questions and find the total cost of Grace's shed.



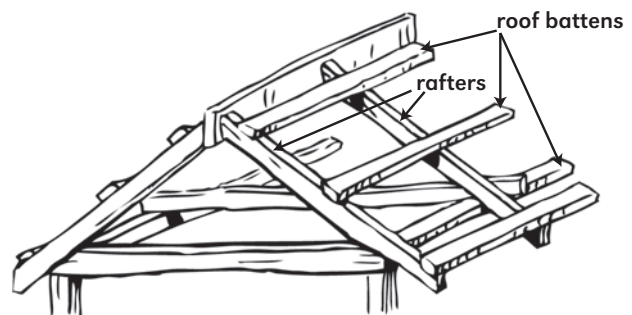
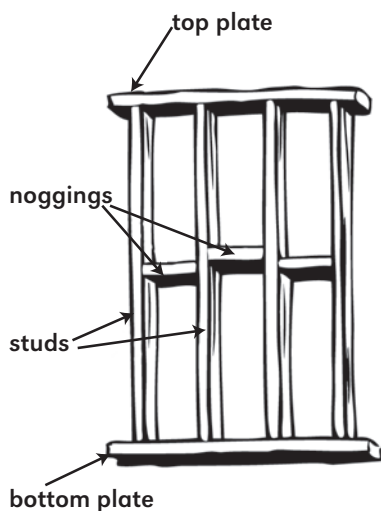
1. The concrete floor will be 6 metres long, 3 metres wide and 100 mm (0.1m) thick.

a) What volume of concrete (in cubic metres) is required for the floor?

b) Find the cost of the concrete needed at £65 per cubic metre.

2. **How much timber is required?**

The timber frame will be made using pinewood. Sections of the frame with the various parts named are shown in these diagrams. Most of the frame will be constructed using 75 x 50 pine. This is 75 mm wide and 50 mm thick. Timber is sold in lineal metres.



Building a shed (cont'd)

Complete this table to work out the total length of 75 × 50 pine that Grace requires.

33 studs 2.5 m long	= 33 × 2.5	= _____	lineal metres
4 plates 6 m long	= _____	= _____	lineal metres
2 plates 3 m long	= _____	= _____	lineal metres
26 rafters 2 m long	= _____	= _____	lineal metres
5 ceiling joists 3 m long	= _____	= _____	lineal metres
Timber for noggings = 15 lineal metres			
Total length of 75 × 50 pine required = _____			lineal metres

Other sizes of timber are also required. The corner posts are to be 75 × 75 pine. Grace requires 150 × 25 pine for the roof ridge, 200 × 75 pine for the front lintel, 75 × 25 pine for the roof battens and 200 × 25 pine for the fascia boards.

3. How much will the timber cost? Here is Grace's list of the amount and cost of each size of timber required for the frame.

_____ lineal metres of 75 × 50 pine at £2.42 per lineal metre	= _____
5 lineal metres of 75 × 75 pine at £2.74 per lineal metre	= _____
36 lineal metres of 75 × 25 pine at £1.48 per lineal metre	= _____
6 lineal metres of 150 × 25 pine at £3.12 per lineal metre	= _____
3 lineal metres of 200 × 75 pine at £6.42 per lineal metre	= _____
12 lineal metres of 200 × 25 pine at £5.98 per lineal metre	= _____
Total cost of the timber:	£ _____

- Write your answer from question 2 for the total length of 75 × 50 pine in the space provided in the first line.
- Complete the table by calculating the cost of each type of timber required.
- Find the total cost of timber that Grace needs to purchase to build the shed frame.

Building a shed (cont'd)

4. The wall cladding

The walls will be covered with weatherboard 230 mm wide and 7.5 mm thick. It is purchased in lengths of 4200 mm (4.2 metres) and costs £12.48 per length.

a) If the walls are 2.28 metres (2280 mm) high, how many boards are required to reach from bottom to top, if they are to overlap by 25 mm?

b) Grace has calculated that she will need to buy a total of 50 lengths of weatherboard. How much will they cost at £12.48 per length?

5. What is the total cost of Grace's shed? Complete this list of all the materials to find the total cost of the shed.

Concrete (use your answer from question 1)	= _____
Timber (use your answer from question 3)	= _____
Weatherboards (use your answer from question 4)	= _____
18 m steel bracing for timber frame at £2.30 per metre	= _____
16 m of architrave at £2.92 per metre	= _____
8 sheets of corrugated iron roofing at £18.48 per sheet	= _____
Ridge capping	= £92.00
12 m of guttering at £3.39 per metre	= _____
1 window	= £179.00
1 roll-up door	= £240.00
Total cost of Grace's shed	= _____

Teacher's notes

Maths in the home is a collection of reproducible worksheets that features the application of mathematical knowledge and techniques in a wide range of contexts relating to the home. The worksheets are self-contained, which makes them useful both in the class and for homework assignments. All these problem-solving activities are suitable for cross-curricular work and can be used to motivate students and to add interest to any mathematics lesson by showing students how maths can be applied to everyday life. *Maths in the home* helps teachers in England build and apply Functional Maths skills. In Wales, these activities will be useful for Essential Skills. In Northern Ireland, the tasks will be useful for both Essential Skills as well as for new curriculum. In Scotland, the real-life approach of the *Maths In* series fully supports the Curriculum for Excellence.

Mapping to the English National Curriculum at Key Stages 3 and 4 and the Adult Core Curriculum is given below. For mapping to Functional Skills standards, please email enquiries@axiseducation.co.uk.

Note: Three worksheets are based on scale drawings (5 - Using floor plans, 6 - Tiling a floor and 7 - Painting a room). It is recommended that the teacher checks these answers using the copy that has been given to their students. Students will find a calculator useful for most worksheets.

1 Using electrical power

In this activity students are required to work out how much energy different appliances use and how much they cost to run.

KS3 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, N2/L1.5, MSS1/L1.1, MSS1/L1.3

2 Paying the gas bill

Here students have to make calculations and create bar charts based on a gas bill. You could extend this activity by bringing in real gas bills and devising similar tasks.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, k, l, o; 2.4a; 3.1a, b, d; 3.2g; 3.3a; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, k, l, o; 3.1a, b; 3.3a; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, N2/L1.5, N2/L1.8, N2/L1.9, MSS1/L1.1, HD1/L1.1, HD1/L1.2

3 Appliances and energy use

This is an activity where students use mathematical skills to analyse the relative efficiency of different electrical appliances.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2f, h, l, o; 2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2f, h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, N2/L1.5, MSS1/L1.1, MSS1/L1.3, HD1/L1.1

4 Appliances and water use

In this activity students calculate the relative water efficiency of washing and dishwashing machines. You could extend this task by asking students to research the water efficiency of a number of specific dishwashers.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2f, h, l, o; 2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2f, h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, MSS1/L1.1, MSS1/L1.6, HD1/L1.1

5 Using floor plans

In this measures, shape and space activity your students use scale drawings to work out dimension, area and perimeter to calculate the quantity and cost of materials needed to decorate rooms. This activity is very extendable, students could use the plans given to make their own interior design - choosing paint, wallpaper, carpets, curtains and even furniture and working out costings.

KS3 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, c, d; 3.2a, e, g, h; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, c; 3.2a; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, MSS1/L2.1, MSS1/L2.3, MSS1/L2.5, MSS1/L2.7, MSS1/L2.10

6 Tiling a floor

This is another measures, shape and space activity where students use a scale drawing to work out quantity and costs of tiles.

KS3 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, k, l, o; 2.4a; 3.1a, b, c, d; 3.2a, e, g, h; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, k, l, o; 2.4a; 3.1a, b, c; 3.2a; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, N2/L2.6, N2/L2.8, MSS1/L2.1, MSS1/L2.3, MSS1/L2.5, MSS1/L2.7, MSS1/L2.10, MSS2/L2.1, MSS2/L2.2

7 Painting a room

Here students again use scale drawings to work out area and the cost of paint.

KS3 Maths

1.1a, b, c; 1.3b, c; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d, f; 3.2a, g, h; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, c; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, e; 3.2a; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, N2/L2.4, N2/L2.6, N2/L2.8, MSS1/L2.1, MSS1/L2.5, MSS1/L2.8, MSS2/L2.1, MSS2/L2.2

8 Furnishing a flat

A mixture of money problems based on furnishing a flat. You could extend this by asking students to make their own home furnishing choices from either Argos or similar catalogues, or the Internet. They could also investigate the range of prices for some of these items - for example an electric kettle could range from £6 to over £100.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, MSS1/L1.1

9 A courtyard garden

This activity requires measures, shape and space skills to work out costs of planting a garden as well as calculating area for paving and using ratio.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d, f; 3.2a, g, h; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, e; 3.2a, b; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, N1/L2.3, MSS1/L2.1, MSS1/L2.5, MSS1/L2.7, MSS1/L2.8

10 Land area

Here students use formulae to work out the area of irregular plots of land. You could extend this task at a local level. Use Google Earth to locate a plot of land and ask students to sketch the land. How many housing plots do they think they could make on the land? This activity is good for human geography and should stimulate discussion about uses of land.

Teacher's notes

KS3 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d, f; 3.2a, g, h; 4b, d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 1.4a; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, e; 3.2a, c; 4b, d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, N1/L2.4, MSS1/L2.1, MSS1/L2.7, MSS1/L2.8

11 Council tax

Students use data handling skills and use percentages to answer questions about council tax. You could extend this activity at your local level by providing students with the current council tax charges for your area and devise questions similar to those in these worksheets. Alternatively you could look at the bands of properties to rent locally and work out how much it would cost to live in properties exclusive and inclusive of council tax.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d; 3.2g; 3.3a; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.3a; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.3, N2/L2.6, N2/L2.8, N2/L2.3, MSS1/L2.1, HD1/L2.1

12 On the net

Students compare internet service providers and packages to find the most cost effective options to meet the needs of different people.

KS3 Maths

1.1a, b, c; 1.3c, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.2g; 3.3a; 4d, f

KS4 Maths

1.1a, b, c; 1.3c, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.3a; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, MSS1/L1.1, HD1/L1.1

13 Household budgets

Budgeting is an essential life skill. Here students use the examples of different household's weekly expenses to hone these skills.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d; 3.2g; 3.3a; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.3a; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, MSS1/L1.1, HD1/L1.1

14 What time is it?

Students read clocks and make calculations using time. You could extend this activity using local bus and train timetables, cinema listings and so on to create a set of relevant activities for calculations using time.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, MSS1/L1.3

15 Taking medicines

Being able to read and calculate medicine doses is another essential life skill. Here students use the examples of different medicines to calculate doses using formulae and fractions.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, m, o; 2.4a; 3.1a, b, f; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, m, o; 2.4a; 3.1a, b, e; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L2.3, MSS1/L1.2, MSS1/L1.4, HD1/L1.1

16 Running a car - petrol consumption and cost

Students calculate rate of fuel consumption, fuel cost and distance travelled.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, m, o; 2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, m, o; 2.4a; 3.1a, b; 3.2g; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, N2/L1.6, MSS1/L2/1, MSS1/L2.5

17 Owning a car

Here students use data to work out the costs involved in owning a car. You could extend this activity by asking students to draw up a shortlist of cars they'd like to own, find out their likely insurance costs, miles per gallon and so on to compare the running costs of their dream cars. You could also find out information on loans for the dream cars.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.2g; 4d, f

Adult Core Curriculum

N1/L2.1, N1/L2.2, N2/L2.7, N2/L2.8, MSS1/L2.1, MSS1/L2.5

18 Breakfast

Here students use maths skills to work out the nutritional value of breakfast cereals. You could extend this by asking similar questions for your students preferred breakfast cereals. Gather data from the whole class and present findings using appropriate charts.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.2, N1/L1.3, N2/L1.9, HD1/L1.1

19 In the kitchen

Use this activity to show how maths skills are also vital in the kitchen. As well as working out temperatures and timings, in this activity students will use their knowledge of weights, measures and ratio to calculate the ingredients needed to increase or decrease the number of servings in a recipe.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, c, d, f; 3.2g; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, c, e; 3.2g; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N1/L1.7, MSS1/L2.4, MSS1/L2.6, MSS1/L2.2, MSS1/L2.5, HD1/L1.1

20 Take-away food

Hone your students abilities to calculate using money with these activities based on different take-away foods. This is an easy activity to extend. Students could carry out a data gathering activity researching the number and type of take-away food shops within a given radius. They can then use the shop menus to compare costs.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o; 2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.4, N2/L1.5, N2/L1.8, MSS1/L1.1, HD1/L1.1

Teacher's notes

21 Going shopping

Being a savvy shopper is a very useful life skill. In these activities students work out savings on multi-buys and calculate the cost of shopping and change.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.5, N2/L1.8,
MSS1/L1.1, HD1/L1.1

22 Best buy or deal

More activities to help your students to become savvy shoppers. In these activities students work out the best value by comparing the quantity of product by price.

KS3 Maths

1.1a, c; 1.3b, d; 2.1c, d; 2.2h, l, o; 2.4a;
3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1c, d; 2.2h, l, o; 2.4a;
3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.5, MSS1/L1.1,
MSS1/L1.4

23 Sportymart Sun and Surf brochure

Some more activities to help students become smart consumers. Here they work out savings on goods in a sale.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.5, N2/L1.9,
MSS1/L1.1

24 Sports sale

Further activities to help students hone their smart consumer skills. Here they work out percentage and monetary savings on sports goods in a sale.

KS3 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b, d; 3.2g; 4d, f

KS4 Maths

1.1a, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
3.1a, b; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.5, N2/L1.8,
N2/L1.9, N2/L1.10, MSS1/L1.1

25 Building a shed

Students use measures, shape and space skills to work out the quantities and costs of materials needed to build a shed. You could extend this by asking students to design and cost the building of their own shed or playhouse.

KS3 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b, f; 3.2a, g, h; 4d, f

KS4 Maths

1.1a, b, c; 1.3b, d; 2.1a, c, d; 2.2h, l, o;
2.4a; 3.1a, b, e; 3.2a; 4d, f

Adult Core Curriculum

N1/L1.1, N1/L1.3, N2/L1.5, MSS1/L1.1,
MSS1/L1.6, MSS1/L1.7, MSS1/L1.10

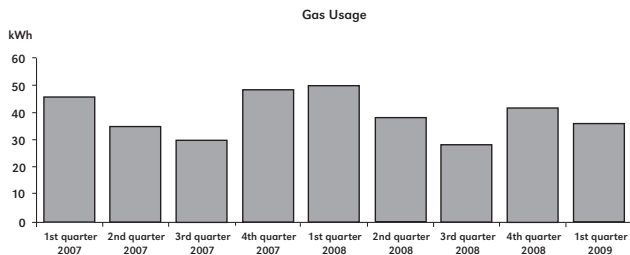
Answers

Using electrical power, pages 5 – 6

- a) 1 b) 2
c) 1.2 d) 0.7
- 25
- a) 10 hours b) 6 pence
- a) 13.3 hours b) 7.2 pence
- a) 66.7 hours b) 1.44 pence
- a) 5 b) 65 pence
- 96 pence
- £1.00
- a) 15.75 kWh b) £1.98
- 44 pence

Paying the gas bill, pages 7 – 8

- £158.70
- £7.94
- £166.64
- 42 kWh per day
- a) 141.64 b) 36 kWh per day
- a) 2576 kWh b) £113.74
c) £119.43 d) 50%
-



Appliances and energy use, pages 9 – 10

- a) Fridge 1 b) 192 kWh
c) £24.42 d) £47.70
e) £23.28 f) £279.36
g) Fridge 1
- a) Dryer 2 b) 70p
c) 57p d) 13p
e) £124.80 f) Dryer 1
- a) Freezer 2 b) £40.35
c) £63.56 d) £232.10
e) Freezer 2

Appliances and water use, pages 11 – 12

- B
- 224 litres
- 180 litres
- 44 litres
- 2.288 kilolitres
- a) 312 litres b) 16.224 kilolitres
c) 6.864 kilolitres
- Dishwasher A
- 55.6
- 66
- 75.6
- 3432
- 2891.2
- 540.8 L
- 4.914 kL

Using floor plans, pages 13 – 15

This worksheet is based on scale drawings. It is recommended that the teacher checks these answers using the copy that has been given to their students.

- 114 mm × 42 mm
- 11.4 m × 4.2 m
- 45 mm × 35 mm
- 4.5 m × 3.5 m
- 15.9 m
- 1.8 m (or 1800 mm)
- a) 3.5 m × 3.5 m b) 3.5 m × 3 m
c) 4.2 m × 2.9 m d) 3.5 m × 1.5 m
e) 3.5 m × 1.5 m
- 47.9 m²
- 28.62 m²
- a) 15.75 m² b) 12.25 m² c) 10.5 m²
- a) 38.5 m² b) 11 c) £562.50
- 16 m
- 15 m
- 48.1 m
- £649.93

Tiling a floor, pages 16 – 18

This worksheet is based on scale drawings. It is recommended that the teacher checks these answers using the copy that has been given to their students.

- 50 cm
- 2500 cm²
- 138 125 cm²
- 29 900 cm²
- 108 225 cm²
- 200 cm²
- 542
- Breakages and allow for tiles to be cut
- 30
- £1,056.00
- 10.8 m²
- £370.00
- £1,434.00

Painting a room, pages 19 – 21

This worksheet is based on scale drawings. It is recommended that the teacher checks these answers using the copy that has been given to their students.

- a) 38.78 m² b) 21.73 m²
- a) 30.48 m² b) 12.87 m²
- a) 34.6 m² b) 5 L
c) 1 × 4 L and 1 × 1 L, £38.45
d) 69.26 m² e) 9 L
f) 2 × 4 L and 1 × 1 L, £75.87
g) £114.32
- a) 47.1 m² b) 7 L
c) 1 × 4 L and 3 × 1 L, £66.96 (Note that it's cheaper to buy 2 × 4 L tins, costing £55.98.)
d) 66.62 m² e) 9 L
f) 2 × 4 L and 1 × 1 L, £75.73
g) £142.69
- £257.01
- a) 48 m² b) £2,448
c) 35 m² d) £1,470
e) £3,918

Answers

Furnishing a flat, pages 22 – 24

- £2,922
 - £708
 - Yes (save £124)
 - £947
 - £1,084.46
- £4,695
 - £593.97
 - £884.96
- £767
 - £115.88
 - £882.88
- £1,886
 - £1,766
 - Jenny will pay £120 more
 - Jenny – £2,273.50, Neve – £2,153.50

A courtyard garden, pages 25 – 27

- 7.7 m
 - 3.3 m
 - 25.41 m²
 - 35
 - 15
 - 525
- £1233.75
- 75
 - £91.75
- Total = £273.50
- £1,507.25
- 7.07 m²
- 10.6 m
 - 5.3 m
 - 56.18 m²
- 49.11 m²
- 0.08 m²
 - 614
- 4.2 kg
- Total = £122.88

Land area, pages 28 – 30

- 16.4 m
- 32.6 m
- 534.64 m²
- 544.5 m²
- 66 m
 - 693 m²
 - 429 m²
 - 1,122 m²
- 864 m²
 - 1,237.5 m²
- 9,630 m²
 - 14,980 m²
 - 24,610 m², 2,461 ha
- 178 m
 - 4,628 m²
 - AEF = 1,035 m², CDG = 1,386 m²
 - 4,752 m²
 - 1.18 ha

Council tax, pages 31 – 32

- £1,110.76
 - 4.84%
 - 84.71%
- £2,062.83
 - 10.45%
-

25% discount for one person
£714.05
£833.07
£952.07
£1,071.08
£1,309.10
£1,547.12
£1,785.14
£2,142.17

- £705.67
 - £87.05
 - £40.36
- £206.28
- £69.42
- 15.38% increase

- £238.02
- 71.43% increase
- £119.01

On the net, pages 33 – 34

- £29.35
 - £19.99
 - £269.23
- £15.22
 - £182.64
 - £14.65
 - £175.80
 - £192.00
- 921 MB
 - £20.54 plan

Household budgets, pages 35 – 36

- £219.43
 - £112.59
- £1,100.40
 - £550.20
- £1,874.96

What time is it?, pages 37 – 39

- 4.30, half past 4
 - 6.45, a quarter to 7
 - 3.05, 5 minutes past 3
 - 4.40, 20 minutes to 5
- 4.00
 - 9.10
 - 5.45
 - 2.30
- 20 minutes past 3
 - 10 minutes past 12
 - 4 minutes past 9
 - 10 minutes to 3
- 4.10
 - 3.25
 - 8.55
 - 12.40
- 1030 hours
 - 1415 hours
 - 0710 hours
 - 1840 hours
- 10.15 am
 - 2.30 am
 - 2.10 pm
 - 8.20 pm
-

Television program times	DVD setting
From 9 am to 11.30 am	On at 0900 hours. Off at 1130 hours.
From 2.30 pm to 4 pm	On at 1430 hours. Off at 1600 hours.
From midday to 2.55 pm	On at 1200 hours. Off at 1455 hours.
From 7.30 pm to 9.45 pm	On at 1930 hours. Off at 2145 hours.

- 4 pm
 - 3 pm
 - 5.45 pm
 - 5.50 pm
 - 1600 hours
 - 0830 hours
 - 1555 hours
 - 0930 hours
- 4 h 40 min
 - 8 h 30 min
 - 5 h 10 min
 - 6 h 30 min
 - 8 h 45 min
 - 6 h 10 min
- 3.20 pm
- 6.55 pm
- 6.55 pm
- 33 min
 - 7.51
 - 20 minutes

Answers

Taking medicines, pages 40 – 42

- 24
- a) 2 b) 2
c) 1 d) 1
- 100 ml
- a) 10 ml b) 10 ml
c) 5 ml d) 2.5 ml
- 10
- 20
- every 4 hours
- 6
- 36 hours
- 2 tablets
- 2 tablets
- 1½ tablets
- no
- a) 1 ml b) 1.5 ml
c) 2 ml d) 2.4 ml
- a) 8 ml b) 4 ml
c) 5 ml d) 10 ml
- 8/25
- 150 months = 12.5 years
- 2/5
- 12 years

Running a car, pages 43 – 45

- 12.63 gallons
- 22.41 gallons
- 24.07 gallons
- 307.5 miles
- 309.4 miles
- 573.5 miles
- 35.83 mpg
- a) 27.6 mpg b) 29.7 mpg
c) 25 mpg d) 23 mpg
e) 32.4 mpg
- a) £28.77 b) £45.07
c) £40.76 d) £52.07
e) £37.07 f) £59.63
- a) 29.85 litres b) 45.84 litres
c) 40.09 litres d) 57.84 litres
e) 35.02 litres f) 48.54 litres
- a) £31.83 b) £37.44
c) £42.44 d) £48.96
- a) 8.81 gallons b) £37.42
- a) £1,075.50 b) £1,265.29
c) £1,434.00 d) £1,654.62
e) £1,720.80
- a) Car A = 2,454.5 litres and Car B = 3,115.4 litres
b) 660.9 litres c) £620.60

Owning a car, pages 46 – 48

- a) £832.10 b) £16.00
- a) £120 b) £1,267.10
c) £24.37
- 21.8 litres
- £20.56
- £60.93

- a) £2,016 b) 41 weeks
- a) Yes b) £87.65
- £4,289.46
- 26p per mile
- £180
- £747.60
- a) £1,840.00 b) £7,360.00
c) £1,472.00 d) £5,888.00
e) £1,177.60 f) £4,710.40

Breakfast, pages 48 – 50

- a) Wheat Brits b) Krispy Flakes
c) Wheat Brits d) Krispy Flakes
e) Wheat Brits
- a) Krispy Flakes 2.6% b) Wheat Brits 11%
- a) Krispy Flakes 83.6% b) Wheat Brits 67%
- a) Krispy Flakes 7.9% b) Wheat Brits 3.3%
- a) Krispy Flakes b) Wheat Brits
- 218 kcal
- 9.2
- a) 158 kcal b) 31.6 g
9. a) 654 kcal b) 9.9 g
- a) 32.7 g b) 2.2 g
c) 5.8 g d) 188 kcal
- a) 98.1 g b) 564 kcal
- a) 20.4 g b) 20 g
c) 20 mg d) 86 kcal
- a) 50 g b) 215 kcal
c) 50 mg
- a) 151.8 g b) 969 mg
- 40.4%

In the kitchen, pages 51 – 53

- a) 80 g b) 1200 ml
- a) 30 g b) 900 ml
- a) 600 g b) 60 g c) 250 g
- a) 450 g b) 45 g
- a) 1,760 g b) 200 ml
- a) 1,320 g b) 375 ml
- a) 4 b) 150 g c) 360 ml
- a) 225 g b) 540 ml
- a) 8 b) 4
c) 1 d) 120 ml
- a) 175 g b) 15 g
- a) 1.5 kg b) 750 ml
- 6
- a) 260°C b) 232°C
c) 204°C d) 149°C
- a) 100 min b) 80 min
c) 110 min
- 3 kg
- 3.25 kg

Answers

Take-away food, pages 54 – 56

- a) £5.20 b) £4.80
- a) £6.90 b) £3.10
- a) £5.30 b) £4.70
- a) £7.05 b) £12.95
- a) £16.25 b) £3.75
- £6.01
- a) £10.98 b) £9.02
- a) £22.48 b) £7.52 c) Yes
- £11.55
- a) £42.70 b) £4.27 c) £38.43
- a) £14.35 b) £5.65
- a) £32.00 b) £6.40 c) £25.60

Going shopping, pages 57 – 58

- a) 44p b) 54p c) 24p
d) 21p e) 58p f) 30p
- a) £7.00, yes b) £13.23, no
- a) £21.17 Change = £18.83
b) £23.50 Change = £16.50
c) £24.43 Change = £15.57
d) £17.22 Change = £22.78

Best buy or deal, pages 59 – 60

- a) £1.205 b) £0.844
c) 5-litre container
- a) £0.041 b) £0.02485
c) £0.02537 d) 200g jar
- 2-litre carton
- a) 100g bar b) 500g jar c) 400g
d) 750g packet e) 415g tin
- £7.90 per kg
- 3-litre bottle
- a)

Cost per piece
£0.92
£0.87
£0.78
£0.80
£0.58

- b) Snack pack c) Party bucket
d) £26.49

Sportymart Sun and Surf brochure, pages 61 – 62

- a) £349.99 b) £60.00
- a) £245.00 b) £69.99 c) £125.00
d) £26.99 e) £39.99 f) £33.50
- a) £44.50 b) 22.47%
- a) 8.9% b) 75% c) 31.6%
d) 125.1% e) 33.3% f) 42.6%
- a) 8.2% b) 42.9% c) 22.5%
d) 25% e) 25% f) 29.9%
- a) £249.00 b) 20.1% c) 25.1%
- a) £75.00 b) 34.7% c) 53.1%
- a) £127.26 b) No

Sports sale, pages 63 – 64

- a) Cricket bat = £199.96
Batting leg guards = £47.96
Batting gloves = £43.96
b) 14.3% c) 35%
d) Amount to pay = £387.78
Saving = £96.97
- a) £72.00 b) £80.00
- a) £109.99 b) 26.7%
- 12.5%
- a) £34.96 b) 28%
- a) £119.70 b) £279.30
- £47.00
- £41.99

Building a shed, pages 65 – 67

- a) 1.8 m³ b) £117
- Total length = 194.5 lineal metres
- Total cost = £647.41
- a) 11 b) £624
- Total cost = £2,176.05