EDEXCEL FUNCTIONAL SKILLS PILOT

TEACHER'S NOTES

Maths Level 2

Chapter 2

Working with fractions, decimals and percentages

Maths Level 2

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Chapter 2: Working with fractions, decimals and percentages

Use these free pilot resources to help build your learners' skill base
We are delighted to continue to make available our free pilot learner resources and teacher notes, to help teach the skills learners need to pass Edexcel FS Mathematics, Level 2.

But use the accredited exam material and other resources to prepare them for the real assessment
We developed these materials for the pilot assessment and standards and have now matched them to the final specification in the table below. They'll be a useful interim measure to get you started but the assessment guidance should no longer be used and you should make sure you use the accredited assessments to prepare your learners for the actual assessment.

New resources available for further support
We're also making available new learner and teacher resources that are completely matched to the final specification and assessment – and also providing access to banks of the actual live papers as these become available. We recommend that you switch to using these as they become available.

Coverage of accredited specification and standards
The table below shows the match of the accredited specification to the unit of pilot resources. This table supersedes the pilot table within the teacher notes.

Coverage and Range	Exemplification	Learner Unit
Understand and use equivalences between common fractions, decimals and percentages	• Simplifying fractions • Finding fractions of a quantity • Improper and mixed numbers • Percentages of a quantity • Convert between fractions, decimals and percentages • Order fractions, decimals and percentages • Writing one number as a fraction of another	**B1** Types of fraction **B2** Using a calculator for fractions **B3** Fractions of quantities **B4** One number as a fraction of another **B5** Adding and subtracting fractions Order fractions, decimals and percentages is covered in our new publishing (see below)
		B6 Remember what you have learned
		D1 Percentages **D2** Using percentages **D3** Percentage change **D4** Converting between forms **D5** Using fractions, decimals and percentages in practical problems
		D6 Remember what you have learned

Where to find the final specification, assessment and resource material
Visit our website **www.edexcel.com/fs** then:
- **for the specification and assessments:** under **Subjects**, click on **Mathematics (Levels 1–2)**
- **for information about resources:** under **Support**, click on **Published resources**.

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2 Working with fractions, decimals and percentages

(pages 15–44 in the learner materials)

Performance	Coverage and Range	Unit Objectives
Learners can:	**Learners can:**	
■ understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations ■ identify the situation or problem and the mathematical methods needed to tackle it ■ select and apply a range of mathematics to find solutions ■ use appropriate checking procedures and evaluate their effectiveness at each stage ■ interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations ■ draw conclusions and provide mathematical justifications	■ add and subtract fractions, add, subtract, multiply and divide decimals to a given number of decimal places	**B1** Types of fraction **B2** Using a calculator for fractions **B3** Fractions of quantities **B4** One number as a fraction of another **B5** Adding and subtracting fractions
		B6 Remember what you have learned
		C1 Decimal numbers **C2** Calculating with money
		C3 Remember what you have learned
	■ understand and use equivalences between fractions, decimals and percentages	**D1** Percentages **D2** Using percentages **D3** Percentage change **D4** Converting between forms **D5** Using fractions, decimals and percentages in practical problems
		D6 Remember what you have learned

Approach to learning

This section covers the skills necessary for learners to be able to work efficiently with fractions, decimals and percentages. Each unit focuses on the delivery of one particular aspect of fractions, decimals and percentages and the questions set allow the learner to practice the full range of skills being taught. The table identifies the coverage and range from the functional skills standards: mathematics level 2 which are covered in this section.

B1 *Types of fraction*

The main idea is to make the learners familiar with the concept of a fraction. Encourage them to compare denominators to give an idea of size. Remind learners that fractions should be written in their lowest terms. Emphasise the connection with the diagrammatic representation. Discuss when they would see fractions in an everyday context.

Activities

Use strips of card marked in different fractions, such as halves, thirds, quarters and ask learners to put the fractions in order of size. This kinaesthetic activity can also be used to identify equivalent fractions.
Use cards to match equivalent fractions, for example: $\frac{3}{4}$, $\frac{6}{8}$, $\frac{9}{12}$
This could be done as a poster activity, putting $\frac{3}{4}$ in the centre, identifying equivalent fractions from a large selection and sticking them around it.
You can also use matching cards to match fractions with their diagrammatic representation, for example, $\frac{2}{3}$ and 

Misconceptions

Learners are often confused when asked to write fractions in their lowest terms as they are unable to identify the common factors. For example, in question 1d, they would have difficulty identifying 9 as the common factor. Encourage them to learn the rules for identifying whether the numbers 2, 3, 5, 9 and 10 are factors and emphasise that they can always divide by 2 if the numbers are even.

B2 *Using a calculator for fractions*

The main idea is to encourage the learners to become familiar with the fraction key on their own calculator, which can vary according to the make of calculator. The most commonly used is the **ab/c** key, but some of the more recent models have a $\frac{\square}{\square}$ key to input fractions. Reinforce that answers involving fractions should be given in their lowest terms and remind them to check their answers using a calculator. Emphasise that they still need to be able to perform calculations using fractions and that they should view the calculator as a checking tool for their answers. Encourage them to make use of the fraction key on the calculator as an aid to learn the rules for calculations involving fractions.

Activities

Use worksheets involving addition and subtraction of two fractions or mixed numbers where the answers are greater than 1, using halves, thirds, quarters, fifths, eighths and tenths. Ask them to work out the answers as mixed numbers using the **ab/c** key and convert to an improper fraction using the SHIFT/INV **ab/c** key, labelled d/c and set out the results in table form under the headings 'calculation', 'mixed number' and 'improper fraction'. Ask them to work out the rule connecting the mixed number and the improper fraction. Discuss the connection between the denominators in the question and the denominator in the answer.

B3 *Fractions of quantities*

The main idea is to help learners develop a consistent approach to finding fractions of quantities. Encourage learners to decide what is their preferred method and stick to it. They need to divide by the denominator and multiply by the numerator and the order does not matter. Remind them that finding $\frac{1}{2}$ of something is the same as dividing by 2. Emphasise that they need to read test questions carefully to ensure they work out the correct fraction. Discuss why the order of division and multiplication for finding fractions of quantities doesn't matter and relate to the BIDMAS rule.

Activities

Make cards containing all the quantities and operations involved for solving questions 3 and 4 on page 19. Include distractors such as division by 2 and multiplication by 5 in question 3. Ask the learners, in pairs or small groups, to identify the correct sequence to solve the problems. Compare the different possible answers. Discuss why they are equivalent.

Misconceptions

Learners often get confused with which numbers to multiply by and which numbers to divide by. For example, in question 1 on page 19 they may divide by 3 and multiply by 8. Try to overcome this by emphasising that to find $\frac{1}{8}$ you should divide by 8 and so for $\frac{3}{8}$ you multiply this answer by 3.

B4 *One number as a fraction of another*

The main idea is that any number can be expressed as a fraction of another number. Encourage learners to read the question carefully and to take care in order to extract from it the correct numerator and denominator. Remind learners of the method outlined on page 20. When dealing with quantities, emphasise the importance of ensuring the two quantities are in the same units. Discuss how you would deal with a question that involves calculating an approximate fraction.

Activities

Make cards for simplifying fractions by approximation, such as that in example 4 on page 21. Ask learners to round both the numerator and denominator to one significant figure and match to the simplified fraction card. Make cards for approximation fractions by identifying common factors and use them in the same way.
Link in to work on units for length and weight: connections between mm, cm, m and km as well as g, kg and tonne, millilitres and litres.

Misconceptions

Learners often have difficulty identifying the correct numerator and denominator. For example, in question 4 on page 21, a common error would be to express £750 as a fraction of £2 250, instead of working out the decrease and expressing this as a fraction of £2 250. Try to overcome this by emphasising they must read the question carefully. The word 'decrease' means the decrease in price must be calculated.

B5 *Adding and subtracting fractions*

The main idea is to ensure learners develop the skills for adding and subtracting fractions and understand where to apply them in real-life contexts. Practical questions usually only involve using halves, thirds, quarters, fifths, eighths and tenths. The work in this section should be linked to work on time, length and capacity, which are the main areas where fractions can be applied. Encourage learners to read the question carefully to identify the operations that are involved. Discuss other contexts where fractions are used, such as in overtime rates and calculating mortgages.

Activities

Use matching cards for fractions of an hour and the time in minutes, fractions of a metre and the length in centimetres and fractions of a litre and the capacity in millilitres, include some distractors.

$\frac{1}{4}$ hour	15 minutes	$\frac{1}{4}$ metre	250 centimetres	$\frac{1}{4}$ litre	250 millilitres
$\frac{1}{2}$ hour	30 minutes	$\frac{1}{2}$ metre	500 centimetres	$\frac{1}{2}$ litre	500 millilitres
$\frac{3}{4}$ hour	45 minutes	$\frac{3}{4}$ metre	750 centimetres	$\frac{3}{4}$ litre	750 millilitres
$\frac{1}{3}$ hour	20 minutes	$\frac{1}{10}$ metre	100 centimetres	$\frac{1}{10}$ litre	100 millilitres

As part of class discussion, ask the learners what is wrong with calculations of the following type and ask them to perform the correct calculation:

$$\frac{6+4}{12} = \frac{6+\cancel{4}^{1}}{\cancel{12}_{3}} = \frac{7}{3} \qquad \frac{2}{3} + \frac{1}{4} = \frac{3}{7}$$

Misconceptions

Learners will often equate, for example, 1 hour 15 minutes with 1.15 hours. Try to overcome this by using the activity for time outlined above and extend it to find other fractions of an hour to emphasise that an hour has 60 minutes, not 100 minutes. Learners will also add two fractions by adding the numerators and denominators. Use the diagrammatic form of the fractions to emphasise that fractions can only be added if the denominators are the same.

C Working with decimals

C1 *Decimal numbers*

The main idea is to establish the applications of addition, subtraction, multiplication and division to decimal numbers and relate decimal numbers to the equivalent fraction forms. Encourage learners to check whether the answers to their calculations make sense. Remind them about the rules for rounding. Emphasise that calculations involving decimals use the rules for whole numbers and fractions. Discuss how to use conversion factors, the relationship to conversion graphs and the background for metric and imperial units.

Activities

Make cards with numbers involving five places of decimals. Ask learners to round the numbers to four, three, two and one decimal places, writing their answers on 'show me' boards.

Make cards with calculations involving short multiplication and division questions, e.g. 0.4 × 0.2, 0.8 ÷ 0.2, and a selection of possible answers, e.g. 0.8, 0.08, 0.4, 4. Ask learners to match calculations to the correct answers.

This could also be approached as a 'round robin' activity. Each learner has a card with a calculation on one side and an answer on the other. A learner starts by reading out their question and the learner with the correct answer reads it out, then reads out their own question, and so on.

Misconceptions

Learners are often confused when they are asked to multiply by numbers involving decimals, for example in question 4 on page 27 they need to multiply 12 by 4.55. Although many will be able to multiply 12 by 4.5 they may be unable to extend this to multiplying by a number with two places of decimals. The partitioning approach can be helpful for this type of question. In particular, if they work out 12 × 0.5 = 6, this can be extended to say 12 × 0.05 = 0.6. In question 3 they need to divide 110 by 2.2 and may give the answer 5 instead of 50. Using estimation can help to decide whether an answer makes sense, but encouraging the approach for writing fractions in their lowest terms will also help: by multiplying numerator and denominator by 10 they can 'get rid of' the decimal point.

C2 *Calculating with money*

The main idea is to perform two-stage calculations involving money and to investigate the connections between different currencies, using conversion factors. Encourage learners to make sure they are consistent with units when questions involve working with items in pounds and in pence. Remind them that it is incorrect to write £3.20 as £3.20p. Emphasise that, when working with money, they should give answers correct to two places of decimals, i.e. to the nearest penny, so £5.4 means £5 and 40 pence. Discuss how it is possible to check whether the answer to a currency conversion makes sense by deciding in advance whether the answer should be more or less than the starting value.

Activities

Give the learners a conversion rate, for example £1 = €1.45. Ask them to work out the equivalent values of £10, £20, £50 and £100 in euros. Let them use these values to plot a conversion graph for pounds to euros, with pounds on the horizontal axis from 0 to 100 and euros on the vertical axis from 0 to 150. Discuss why the graph should pass through the point (0, 0).
Ask the learners to use their graphs to convert values from pounds to euros, e.g. £15, £35 and £75, and check their answers by using the conversion rate. They can also use the graph to convert from euros to pounds.
The above activity can be extended to finding the gradient of the graph. The gradient should be close to 1.45, which is the exchange rate of euros per pound. Plotting the graph the other way round will give the exchange rate of pounds per euro.
Make up cards containing a sequence of operations such as those needed for questions 3 and 5 on page 29. Ask learners to put them in order, to work out the answer. Make up further cards containing the inverse operations and distractors, for example, × 32.5 as well as ÷ 32.5, and ask the learners to identify the order for checking the calculation. Discussion will identify the need to use brackets and the BIDMAS rule.

D Working with percentages

D1 *Percentages*

The main aim is to reinforce that percentages are a way of expressing a proportion out of 100 and to convey the idea that it is possible to have a percentage that is greater than 100 when a value or quantity is increased. Encourage learners to relate percentages to fractions, in particular, 25% = $\frac{1}{4}$ so that finding 25% is equivalent to dividing by 4.
Remind learners that to work out 10% they should divide by 10, then 5% is found by dividing this answer by 2 while 20% means multiplying the answer for 10% by 2. Emphasise that this method only works for 10%, for example, to find 50% you would not divide by 50.
Discuss the different methods of calculating percentage increase and decrease and advise the learners to try all the methods outlined in the Skills Book, decide which they like best and stick with it.

Activities

Percentage carousel: Make a handout showing three ways to increase £2.40 by 40% [find 10% first then multiply by 4 and add it on; $\frac{40}{100}$ × 2.4 cancelling and adding it on; $\frac{140}{100}$ × 2.4, cancelling]. Ask learners to try out all the methods and discuss which one they would use.
Use a similar activity for decreasing £2.40 by 40%.

Misconceptions

Learners will often become confused in percentage increase and decrease questions and forget either to add or to subtract an amount from the original quantity. For example, in question 2 on page 33 they may find 5% of 80 and write 4 as their answer instead of adding this to 80. Emphasise that if the amount increases, it will be more, so they must add the increase on. If the amount decreases it will be less, so they take the decrease away.

D2 *Using percentages*

The main idea is to apply the techniques of calculating with percentages to everyday calculations including VAT and interest rates. Encourage learners to be systematic when working out percentages and keep to the method they have found suits them best.
Remind learners that expressing one quantity as a percentage of another follows the same basic principle as for fractions except that they also need to multiply by 100. Emphasise that when they are expressing one quantity as a percentage of another the quantities must be in the same units. Discuss the principles of rounding for finding approximate percentages and the methods already discussed for determining the correct calculation and inverse calculation for checking. As a discussion for interest: AER stands for *annual equivalent rate* and represents the yearly interest rate paid on savings. APR stands for *annual percentage rate* and is used in connection with borrowing money, e.g. loans, mortgages, credit cards. It represents the yearly interest rate that the borrower pay the lender. AER is the exact opposite of APR. You should look for the highest AER when investing money but the lowest APR available when borrowing money.
Encourage the learners to become familiar with the use of the percentage key on their calculator as a tool to check their calculations.

Activities

Prepare pairs of cards, with one showing values to be expressed as an approximate percentage of something by rounding, and the other showing the actual percentage. Include quantities such as 40p and £2, where the units need to be changed.
Make cards based on scenarios such as that in question 3 on page 35. Have ready cards outlining the necessary calculations to work out the problem, with distractors, as well as cards outlining the appropriate calculations to check the answers.
Investigation: A customer is offered a 10% discount on the price of a TV but he must pay 17.5% VAT. The basic price of the TV is £335. Does it make any difference whether the discount is subtracted before or after adding the VAT?

Interest calculations can be extended to an Excel activity in which learners work out the total amount in the account after, say, five years.

Misconceptions

Learners may have difficulty identifying the values for the numerator and denominator when calculating one quantity as a percentage of another. For example, in question 7 on page 35, learners may work out $\frac{£1.24}{£1.51} \times 100$ or $\frac{£0.27}{£1.51} \times 100$ instead of $\frac{£0.27}{£1.24} \times 100$. Emphasise that they should read the question carefully; this asks them to express the *increase* as a percentage of the *original* price. This identifies that the numerator is the increase and the denominator is the original price.

D3 *Percentage change*

The main idea is that learners become familiar with the formula for percentage change and recognise its applications. Encourage learners to adopt a methodical approach, by first identifying the actual change and the original value. Remind them that they need to be able to apply all the skills they have learnt for identifying calculations and checking. Emphasise that when they are expressing one quantity as a percentage of another the quantities must be in the same units. Discuss percentage profit and percentage loss in context by asking for examples when these may occur.

Activities

Make cards of scenarios such as question 4 on page 37. Have ready cards outlining the necessary calculations to work out the problem, with distractors, as well as cards outlining the appropriate calculations to check the answers. In this example, they will need to use brackets. Discuss the rules of BIDMAS.

Misconceptions

The same misconceptions apply here as for using percentages. For example, in question 3 on page 37, many learners will work out $\frac{£300}{£1200} \times 100$ instead of $\frac{£300}{£1500} \times 100$. Again emphasise that they need to read the question carefully. Percentage loss is the *actual loss* divided by the *original value* multiplied by 100 so the answer must be $\frac{£300}{£1500} \times 100$.

D4 *Converting between forms*

The main idea is that learners should know how to convert between fractions, decimals and percentages. Encourage learners to learn the equivalences given in the table on page 41. Remind them that fractions need to be given in their lowest terms. Emphasise the place value of decimal numbers. Discuss the methods for conversion, as outlined in the learner materials.

Activities

Matching card activity for fractions, decimals and percentages. Prepare cards with equivalences for fractions, decimals and percentages and ask learners to work in pairs or small groups to match the sets of three. Include fractions such as $\frac{3}{8}$, $\frac{5}{8}$ and $\frac{7}{8}$ as well as $\frac{3}{20}$, $\frac{7}{20}$, $\frac{9}{20}$, $\frac{11}{20}$, $\frac{13}{20}$, $\frac{17}{20}$ and $\frac{19}{20}$.

Misconceptions

The most difficult aspect of converting between fractions, decimals and percentages is converting from a fraction to a decimal or percentage. One fraction, in particular, which causes problems is $\frac{1}{3}$.
$\frac{1}{3}$ is $33\frac{1}{3}\%$ which is greater than 30% which is $\frac{3}{10}$ as a fraction. Learners should be encouraged to learn the connection:

Fraction	Decimal	Percentage
$\frac{1}{3}$	$0.\dot{3}$	$33.\dot{3}$ or $33\frac{1}{3}$

Logic can assist in finding the correct solution, for example, in question 9 on page 43, the question asks for $\frac{5}{8}$ as a fraction. Encourage learners to compare the numerator with the denominator. As 5 is greater than half of 8, they should be able to eliminate the first option of 16% straight away as the answer is more than 50%. Also 5 is only just over half of 8 so logic should also eliminate 85%.
It could be helpful to show this table to compare fractions with decimals and percentages, using successive division by 2:

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{8}$	0.125	12.5%

So $\frac{5}{8}$ is $5 \times 12.5\%$. As $5 \times 12 = 60$ the answer is greater than 60% so the answer must be 63%.

D5 *Using fractions, decimals and percentages in practical problems*

The main idea is to apply the methods for comparing fractions, decimals and percentages to real situations. Encourage learners to remember the rules for conversion. Remind them that, when they are using fractions, if the numerator is less than half of the denominator the fraction is less than 50%. Emphasise that if the question involves a comparison of decimals, fractions and percentages it is usually easier to do this by changing them all to percentages.

Discuss using equivalent fractions as an alternative method when the denominator is a factor of 100.
When tackling practical questions, encourage learners to consider whether to use fraction, decimal or percentage form for calculations. Remind them to read the questions carefully to check exactly what is asked for in the question, for example, in questions involving VAT is it the VAT that is asked for, or the price including VAT?

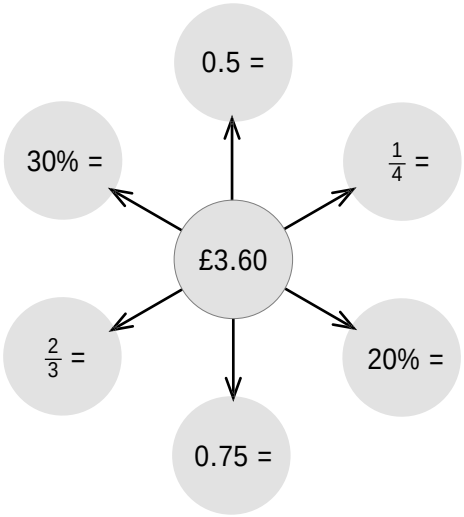
Activities

Prepare a selection of cards with a missing operation. For example:

45 kg × ? = 15 kg

with options including | $\frac{1}{3}$ | | 30% | | 0.3 |.

Design activities such as that shown in the diagram.



Design examples similar to those on the learner pages. Ask learners to identify the number of different ways to work out the solution from a selection of cards, for example:
The value of a house increases by $3\frac{1}{2}$% in a year. The value of a house at the beginning of the year is £200 000. What will be the value at the end of the year?
200 000 + (3.5 ÷ 100 × 200 000)
$3\frac{1}{2}$ × 200 000 + 200 000
100
0.035 × 200 000 + 200 000
200 000 × 1.035
Remember to include some distractors. Ask the learners to work in pairs or small groups to design their own similar type questions in pairs and swap these between the pairs.

Misconceptions

The same misconceptions as described above also apply here. In question 11 in section D6 for example, the proportion of learners is also described in words, which may cause difficulty.
Emphasise that 2 in every 10 means 2 out of 10 so it is the same as $\frac{2}{10}$.
This is an example where reminding learners about equivalent fractions could also be helpful. Encourage the learners to write $\frac{2}{10} = \frac{20}{100} = 20\%$ instead of simplifying $\frac{2}{10}$ to $\frac{1}{5}$.

Apply the skills

The learners need to develop their Process Skills, which are:

Representing	Analysing	Interpreting
Making sense of situations and representing them	Processing and using the mathematics	Interpreting and communicating the results of the analysis

At level 2 the learners must decide on the methods used and identify the information they need for themselves. A suitable activity to practice these number skills would be to check the accuracy of utility bills and to investigate more economical options. A **level 1 practice** task is given below.

For a level 2 activity, the learners should use a similar approach on their own utility bill, i.e. electricity, gas, water or telephone. In particular, a gas utility bill requires greater depth of understanding.

To work out the amount of gas you have been charged for:

- Take the previous meter reading from the present reading.
- Multiply the answer by 2.83 to give the number of cubic metres of gas supplied.
- Multiply the answer by the Volume Conversion Factor, 1.022640 and then by the calorific value, 39.1 MJ/m^3.
- Divide the answer by 3.6 to give the number of kilowatt hours (kWh).
- This number is multiplied by the price per kilowatt hour to give the gas charge.

Use a website (e.g. www.moneysupermarket.com) to investigate the costs of other household utilities.

How much does electricity cost?

The table shows part of Kerry's latest electricity bill.

Your task is to check to see if the amounts given in the bill have been calculated correctly and to investigate cheaper options.

You must show evidence of checking your work using different methods, including whether your results make sense. You may use ICT to complete this task, but you must include evidence of all your calculations.

1. Use a calculator to check if the number of units used is correct.
2. Use a calculator to check to see if the charges for electricity used are correct.
3. Round the charges for electricity to the nearest ten pounds. Use this value to work out the approximate amount for VAT at 5%. Is it close to the amount of VAT shown in the bill?
4. Without a calculator, add the VAT to the subtotal. Does this amount agree with the total charges shown in the bill?
5. Use the bill to estimate how much Kerry can expect to pay for electricity per month. Is your estimate a reasonable amount per month all year round?
6. Consumer advice suggests energy-saving devices can reduce Kerry's current bill by a third. How much can she expect to save per month if she follows this advice?

Kerry wants to switch to a monthly direct debit plan.

Discuss in your group how much would be a reasonable monthly amount to pay based on the information you have.

	Previous	**Present**	**Units used**	**Total**
Readings				
Period Covered	31/05/07	31/08/07		
	27578	28400	822 kWh	
Charges for Tariff – Standard Meter/Monthly Direct Debit				
Electricity charges from 29/05/07 to 15/08/07				
196 kWh at 15.35p				**£30.09**
626 kWh at 11.00p				**£68.86**
Subtotal (excluding VAT)				**£98.95**
VAT at 5% on £98.95				**£4.95**
Charges for this period				**£104.80**

Sample extended tasks

Use a search engine to compare electricity costs to see if you can find Kerry a cheaper deal (e.g. www.moneysupermarket.com)

For any offers investigated, check out

- the unit rate for electricity
- how much Kerry's electricity consumption would cost her with this rate before VAT is added
- how much she is likely to save.

Answers

B Working with fractions

B1 Types of fraction – *page 15*

1. a $\frac{3}{4}$ **b** $\frac{3}{4}$ **c** $\frac{22}{25}$ **d** $\frac{3}{4}$

2. a $2\frac{2}{3}$ **b** $4\frac{3}{7}$ **c** $2\frac{5}{8}$ **d** $6\frac{7}{9}$

3. a $\frac{11}{6}$ **b** $\frac{13}{5}$ **c** $\frac{26}{7}$ **d** $\frac{43}{10}$

B3 Fractions of quantities – *page 18*

1. 20 250 **2.** 450
3. £11 250 **4.** 48
5. £60 **6.** 7

B4 One number as a fraction of another – *page 20*

1. $\frac{7}{10}$ **2.** $\frac{5}{8}$ **3.** $\frac{27}{100}$

4. $\frac{2}{3}$ **5.** $\frac{79}{120}$

B5 Adding and subtracting fractions – *page 22*

1. 4 hours **2.** $4\frac{1}{2}$ hours

3. $\frac{1}{2}$ hour **4.** $1\frac{1}{4}$ hours

B6 Remember what you have learned – *page 24*

1. C **2.** C **3.** D **4.** D
5. A **6.** B **7.** C **8.** B
9. C

C Working with decimals

C1 Decimal numbers – *page 26*

1. 45.72 cm
2. a £0.07 or 7p
b £1.40
3. 50 kg
4. 54.6 litres

C2 Calculating with money – *page 28*

1. £65 **2.** £503.25
3. £11.71 **4.** £89.75
5. £253 **6.** 320 × 1.45 or 464 ÷ 1.45
7. £7200 **8.** $518

C3 Remember what you have learned – *page 30*

1. D **2.** B **3.** D **4.** A **5.** A
6. C **7.** D **8.** C **9.** C

D Working with percentage

D1 Percentages – *page 32*

1. 72 **2.** 84 **3.** 63 **4.** 396
5. 300 **6.** 527 **7.** 176.4 **8.** 6.5

D2 Using percentages – *page 34*

1. £1.20 **2.** £209
3. £2.75 **4.** £141
5. 30% **6.** 27%
7. 20% (21.77%) **8.** 65% (64.75%)

D3 Percentage change – *page 36*

1. 34% **2.** 25% **3.** 20% **4.** 5%

5. $33\frac{1}{3}$ **6.** 20% **7.** 10%

D4 Converting between forms – *page 38*

1. a 0.8, 80% **b** 0.15, 15%
c 0.28, 28% **d** 0.875, 87.5%

2. a 16%, $\frac{4}{25}$ **b** 32%, $\frac{8}{25}$

c 8%, $\frac{2}{25}$ **d** 56%, $\frac{14}{25}$

3. a 0.64, $\frac{16}{25}$ **b** 0.24, $\frac{6}{25}$

c 0.45, $\frac{9}{20}$ **d** 0.085, $\frac{17}{200}$

D5 Using fractions, decimals and percentages in practical problems – *page 40*

1. £210 **2.** 552 people **3.** £20 800
4. £9750 **5.** £3 186

D6 Remember what you have learned – *page 41*

1. D **2.** B **3.** D **4.** A
5. B **6.** D **7.** D **8.** B
9. C **10.** D **11.** A **12.** A
13. C **14.** C **15.** C