Module 7:
Session plan

Group: _____

Tutor: _____

Location: _____

Aims

- Develop and/or consolidate numeracy skills around problem solving, relevant to their role in the NHS.
- Prepare for typical questions from the Level 1 National Certificate in Adult Numeracy.

Outcomes

- Discuss and use problem-solving approaches to tackle maths questions.
- Discuss and use checking methods to confirm answers to situations involving maths calculations. N1/L1.9
- Distinguish between questions involving decimals, fractions and percentages. N2/L1.3
- Relate problem solving to their own experience and work role.

Activity and time	Tutor activity	Learner activity
Icebreaker 5 minutes	• **Activity 1: Equivalencies matching cards** (use shaded cards as extension if appropriate).	• Activity 1 in pairs.
Introduction 15 minutes	• Briefly discuss which numeracy skills that participants have used at work or in their everyday life since last session. • Show Module 7 **slides 2 and 3** giving objectives for the session: explain the value of using a problem-solving approach to tackle maths questions as a useful foundation skill.	

Activity and time	Tutor activity	Learner activity
Using a problem-solving approach: tackling the question 40 minutes	• Introduce Using a problem-solving approach, using **slide 4**. • Encourage participants to identify examples of when they use this sort of approach in their work roles. • Use **slides 5–9** to talk through, as a whole group, examples illustrating different aspects of tackling the question (picking out key information: what information have we got? What does the question ask? Visualising the problem; what sort of answer is wanted? – see guidance notes for suggestions around each slide). • **Activity 2: Sifting the information.** • **Activity 3: Working out in several steps.** • **Activity 4: Visualising the problem.**	• Contribute and respond. • Activity 2 in pairs. • Activity 3 in pairs. • Activity 4 in pairs.
Using a problem-solving approach: thinking about the answer 20 minutes	• **Use slide 10: Checking your answer** to discuss ways to check the answer (estimated answers, checking back methods, using alternative methods). • **Use slide 11: Interpreting the answer** if appropriate to discuss as a whole group the difference in rounding decisions between 'collecting' and 'sharing' situations. • **Activity 5: Interpreting the answer** (use the section below the line as an extension activity if appropriate). • **Offer Handout 6: Using a problem-solving approach** as a summary of ideas covered.	• In pairs/threes, consider the calculations (slide 10) and discuss strategies for checking answers; contribute to plenary to share ideas. • Activity 5 in pairs. • Activity 5 – questions below the line: decide whether to round up or down as appropriate for each scenario.
Break 15 minutes		

Activity and time	Tutor activity	Learner activity
Making links between percentages, decimals and fractions 25 minutes	• Use slides **12–14** to build on work already done in previous sessions to encourage participants to think through as a group how to convert between percentages, fractions and decimals. • Encourage participants to do those of 7a–7e that are appropriate for them: – **Activity 7a:** How do percentages, fractions and decimals relate? – **Activity 7b:** Percentages, fractions and decimals equivalences dominoes – use 7a and 7b for less confident participants for whom revising the common equivalences will be most useful – **Activity 7c:** Writing percentages as fractions – **Activity 7d:** Writing fractions as percentages – **Activity 7e:** Writing fractions as decimals and percentages – use Activities 7c–7e for participants you think would find them manageable and useful. Direct participants if appropriate to which of 7c–7e you suggest they do (if not all).	• Contribute and respond. • Activities 7a and 7b ***OR*** • Activities 7c, 7d and/or 7e as appropriate.
Practice test questions 45 minutes	• **Activity 8: Practice test questions.** • Plenary to discuss approaches. • Discuss idea if appropriate that once you get a sense of the size of the answer, you may not need to calculate it with multiple-choice questions.	• Activity 8 individually or in pairs. • Contribute to plenary.

Activity and time	Tutor activity	Learner activity
Summary 15 minutes	• Revisit session objectives (Module 7, **slide 3**). • Feedback, comments and questions. • **Programme journal (slide 15).** • Discuss opportunities to apply skills to work and everyday life. • Offer **practice test** for practice at home. • Discuss individual tasks and opportunities for practice (**slide 16**).	• Reflect on session and identify areas for further practice. • Agree independent learning task(s).

Resources/aids:

- Module PowerPoint presentation
- Activity cards: Activity 1, Activity 7b
- Activities: 2, 3, 4, 5, 7a, 7c, 7d, 7e, 8
- Handouts: 6
- Practice test: Module 7
- programme journals
- flipchart and markers
- small whiteboards and pens
- any supplementary materials.

Assessment evaluation

Individual learning planning

Learner	Skills	Activity/ resources	Evaluation (where next?)

Module 7: Problem solving
Teacher's notes

Icebreaker

Use Activity 1: Equivalencies matching cards as an icebreaker. Ask participants in pairs or threes to match the percentages with their equivalent fractions and decimals. Use the shaded cards as extension cards if appropriate, giving these as well as the other cards to the more confident participants in the group (and only the white cards to less confident members of the group).

Introduction

- Discuss what participants have done since the last session:
  Did they have opportunity to apply the work on fractions in any ways at work?
  What skills practice have they done?
  Are there any bits (or questions) in particular that are causing difficulty?
- Outline the aims and objectives of the module (show **slides 1–3**).

Discuss with participants that a big element of using maths confidently is about working out what you need to calculate and deciding how to calculate it most effectively – although people often only think of arithmetic ('doing sums') when they think about maths. Point out that from their everyday and work experience, many adults have good 'common sense' problem-solving skills, and can make use of these to strengthen their confidence with their maths skills.

Remind participants of the point made during sessions 1 and 4 that sometimes practice will be provided on key background skills or concepts that are important to help with other maths topics. Explain that the aim of this session is to help participants to be more confident with using problem-solving approaches to tackle maths questions. Explain that it can make you more confident with maths if you use this type of approach, rather than relying on a series of rote actions or calculations for each topic. Firstly, it helps if you forget what it is you need to do, and secondly it makes you more able to tackle unfamiliar and varied questions. In addition, the human brain remembers things better when it can make sense of them and has a context to which to tie them. Therefore, an important aspect of the course has been, and will continue to be, understanding underlying concepts and making links between different areas of maths.

Using a problem-solving approach: tackling the question

Using **slide 4** to introduce the idea of using a problem-solving approach, encourage participants to discuss and relate this to work that they have done so far on the course and what they do in working and everyday life when they meet new situations. Encourage them to identify contexts in their work roles where they need or use problem-solving skills and strategies of this sort.

Use **slides 5–9** to talk as a whole group through examples illustrating different aspects of tackling the question, and collect participants' ideas and examples:

Slide 5: Picking out key information – *Which information do we need to work out what the question asks? Which information is not important?*

Slide 6: What information have we got? The question asks about what fraction is women; we know how many are men (from the information given).
How will we work out the fraction of women?

Slide 7: What does the question ask?
How will we work these out?

Click through the sequence to reveal each question in turn and discuss the above question for each; then compare all the three questions with one another at the end (final click in this sequence). Note that they all use the same information but ask us to make use of it in slightly different ways.

Slide 8: Visualising the problem. Some situations/questions lend themselves to being visualised to help work out what is needed. Use slide 8 to demonstrate this with the question given. Encourage participants to suggest examples from working/everyday life when they use (or could use) a visual representation to help them make sense of and work out maths-related questions.

Slide 9: What sort of answer is wanted? Discuss the answer to the first question (what percentage are women?) and an approach (or approaches) to work this out. Click to reveal the second question and discuss as a group: *What are the important differences between this question and the first one?* (The second asks about men, but also asks for a fraction).

Offer Activities 2–4 (in pairs) as practice of these ideas:

Activity 2: Sifting the information – The purpose of this activity is not to work out the answers necessarily, but to identify information in the question (by highlighting/underlining it), especially numbers, that are not needed to work out the particular question asked.

Activity 3: Working out in several steps – These questions all need several steps to get to the answer (the first are examples used in the PowerPoint, but participants may want to work them out themselves, using their own approach). In pairs, discuss approaches to answering these questions and how to lay them out to help in answering them.

Activity 4: Visualising the problem – Discuss which of these you could create a diagram to represent, which might help in making sense of the question and working out the answer.

After these activities, feed back as a group on how they went: what worked well, strategies and answers.

Using a problem-solving approach: thinking about the answer

Use **slide 10: Checking your answer** to discuss ways to check answers:

Discuss that sometimes if you look at an answer (once you've worked it out), it can't really be right eg because it is clearly too big or too small.

Do any of the answers on slide 10 look wrong in this way?

Sometimes this is not the case, so it is useful to have ways of checking the answer you've got.

How could we check the answers on slide 10?

Elicit ideas from participants, including: using estimated answers, checking back methods, using alternative methods to calculate the same question.

Ask participants to do **Activity 5: Interpreting the answer** in pairs. Draw attention to the value of thinking about what units an answer will be in, and encourage them to use this as an opportunity to focus on and record this for each question in Activity 5 above the line.

As an extension activity if appropriate, use **slide 11: Interpreting the answer** to discuss as a whole group the difference in rounding decisions between 'collecting' and 'sharing' situations. (You may round differently according to the situation, rather than just using the traditional '5 or more => round up' approach: if you are sharing an amount, this may limit the total you have available to give out, so you may need to round down; if you are collecting, you need at least the amount required, so you may round up). The section below the line on Activity 5 can then be used as an extension activity, if appropriate, for more confident participants to try.

Offer **Handout 6: Using a problem-solving approach** as a summary of ideas covered.

Making links between percentages, fractions and decimals

Use **slides 12–14** to build on work already done in previous sessions to encourage participants to think through as a group how to convert between percentages, fractions and decimals. Encourage participants to share and explore ideas, making use of their mathematical knowledge and drawing out new links where possible.

Elicit/talk through the ideas of:

Slide 12: Percentage ⟶ fraction

Ask participants to think about changing 20% into a fraction. They may already know the equivalence OR as percentage means 'out of every 100', can change to a fraction with 100 on the bottom.

They can then simplify this fraction if appropriate.

Click to reveal the next section.

Percentage ⟶ decimal

Ask participants to think about changing 20% into a decimal. They may already know the equivalence OR as percentage means 'out of every 100', can convert it into a fraction with 100 on the bottom and then convert this into a decimal by thinking of hundredths on a place value chart.

Slide 13: Fraction ⟶ percentage

This is easy if the denominator is 100, so they can use equivalent fractions to get to */100, and then convert into a percentage.

Slide 14: Fraction ⟶ decimal

They could either:

- convert the fraction so that it has a denominator of 10 or 100 and then use place value chart

or

- Think of the fraction as denominator 'out of' (or divided by) numerator – ***no need to use the terminology!*** – so for example 3/5 is 3 divided by 5.

Relate this back to work done in previous sessions (3 and 4 in particular).

Offer Activities 7a–7e as practice in using these ideas (in pairs) as appropriate. Encourage participants to try those that will be most useful for them. Make clear that the approaches covered in slides 12–14 aim to help them to make links between things they've learned and extend their thinking about percentages, fractions and decimals and what these mean. (They will not directly be asked to convert between percentages, fractions and decimals in the Level 1 National Test – only to recognise the most common equivalences):

Activity 7a: How do percentages, fractions and decimals relate?

Activity 7b: Percentages, fractions and decimals equivalences dominoes

Use these for less confident participants for whom revising the common equivalences will be most useful.

Use Activities 7c–7e for participants who you think would find them manageable and useful. Direct participants if appropriate to which activities of 7c–7e that you suggest they do (if not all):

Activity 7c: Writing percentages as fractions
Activity 7d: Writing fractions as percentages
Activity 7e: Writing fractions as decimals (and percentages).

Ask participants to do **Activity 8: Practice test questions** (in pairs). Explain that the purpose will be to discuss approaches and answers chosen (and why) to broaden experience of tackling test questions.

In the plenary, discuss approaches including, if appropriate, the idea that once you get a sense of the size of the answer, you may not need to actually calculate the answer with some multiple choice questions (eg questions 4, 5 and 6).

Offer **Practice test: Module 7** for participants to try between sessions. Explain that this will give practice with a mix of typical questions from the Level 1 National Test to build confidence and experience of tackling a range of questions. Encourage participants to time themselves as preparation for taking the actual test in a few weeks – and, if possible, to aim to complete the 20 questions in 45 minutes. (This is slightly longer than they will get in the actual test.) Explain that you will review the questions next session and discuss any questions that participants were not sure about.

Summary

- Revisit the session objectives (**slide 3**) and reflect on how the session went.
- Encourage participants to reflect on what worked well for them as an individual, and to think about which strategies/information helped them most in understanding, remembering or learning more about problem solving and tackling maths questions.
- Encourage the group to identify any aspects that they are still unsure about/want to practise further, and encourage them to continue to use the free resources available to do this (**slide 16**) between sessions as appropriate.
- Encourage participants to identify opportunities to relate what they have learnt to their work context/role between sessions, eg noting maths situations around them and which method(s) work best for these.
- Encourage the participants to record relevant information on a **programme journal (slide 15)**.

Some suggestions for further practice if required

Multiplying

www.bbc.co.uk/skillswise/numbers/wholenumbers/multiplication/problemsolving

Dividing by single digit numbers

www.bbc.co.uk/skillswise/numbers/wholenumbers/division/problemsolving

www.bbc.co.uk/skillswise/numbers/wholenumbers/whatarenumbers/rounding

www.keyskills4u.net supporting level 1 – Carrying out calculations section: Rounding answers.

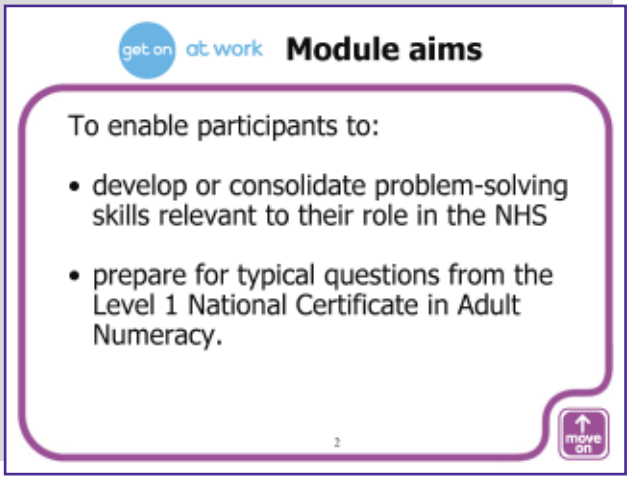
www.keyskills4u.net at level 1 – Carrying out calculations section: Rounding answers.

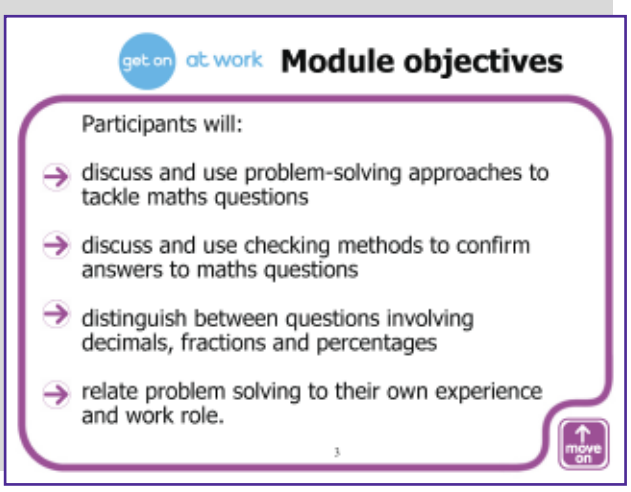
www.keyskills4u.net supporting level 1 – Interpreting information section: Estimating amounts.

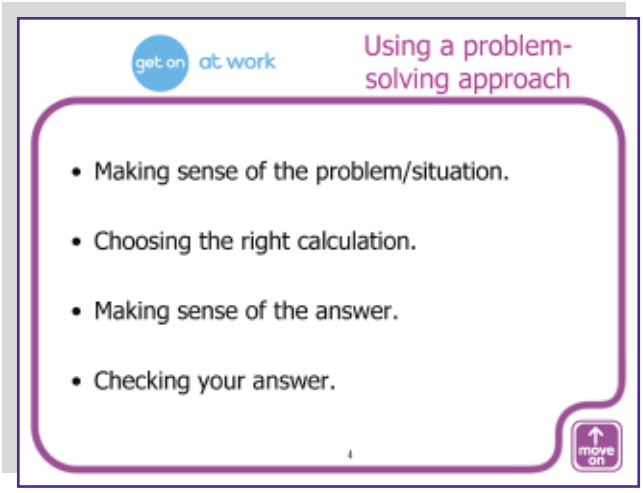
www.keyskills4u.net supporting level 1 – Carrying out calculations section: Checking methods.

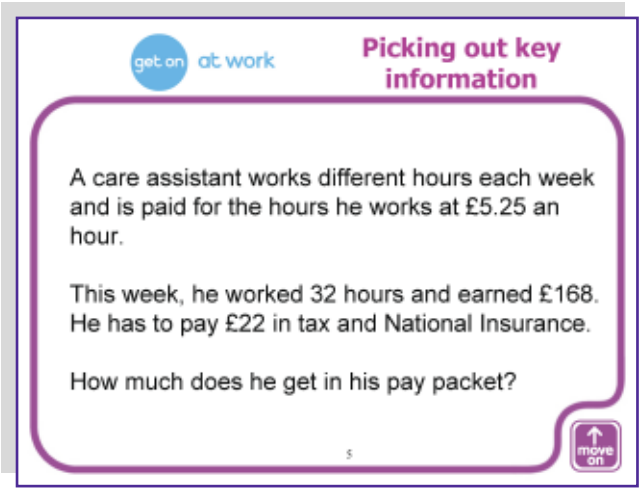
www.keyskills4u.net at level 1 – Carrying out calculations section: Checking methods.

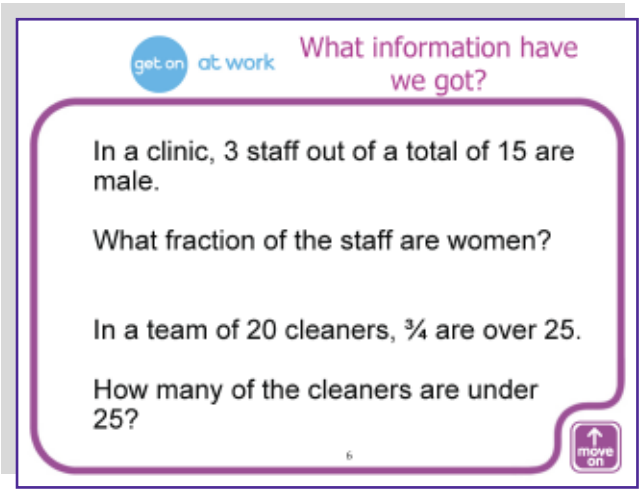

get on at work
Move On in the NHS
move on


get on at work
Module aims
To enable participants to:
• develop or consolidate problem-solving skills relevant to their role in the NHS
• prepare for typical questions from the Level 1 National Certificate in Adult Numeracy.
2
move on


get on at work
Module objectives
Participants will:
discuss and use problem-solving approaches to tackle maths questions
discuss and use checking methods to confirm answers to maths questions
distinguish between questions involving decimals, fractions and percentages
relate problem solving to their own experience and work role.
3
move on


get on at work
Using a problem-solving approach
• Making sense of the problem/situation.
• Choosing the right calculation.
• Making sense of the answer.
• Checking your answer.
4
move on


get on at work
Picking out key information
A care assistant works different hours each week and is paid for the hours he works at £5.25 an hour.
This week, he worked 32 hours and earned £168. He has to pay £22 in tax and National Insurance.
How much does he get in his pay packet?
5
move on


get on at work
What information have we got?
In a clinic, 3 staff out of a total of 15 are male.
What fraction of the staff are women?
In a team of 20 cleaners, ¾ are over 25.
How many of the cleaners are under 25?
6
move on

get on at work

What does the question ask?

Maya is supervising a project to make agreed changes to 5 bays in a ward. She has been given a budget of £1,000 to complete the project.

She spends £135.50, £254.90, £144.50 and £115.10 on different elements that contribute to the changes needed.

- How much of her original budget has she got left?
- How much have the changes actually cost *per bay* ?
- How much more or less per bay did the refurbishments cost than the original budget provided?

7

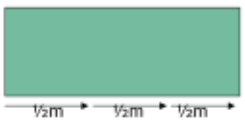
move on

get on at work

Can I represent the problem visually?

On a room plan, a wardrobe is 3 cm wide.
1 cm on the plan represents ½ metre in the real room.

How wide is the wardrobe in real life?



8

move on

get on at work

What sort of answer is wanted?

In a ward, there are 3 male and 9 female staff.

What percentage of the staff are women?

What fraction of the staff are men?

9

move on

get on at work **Checking your answer**

£12,000 ÷ 40	=	£3,000
£10.00 - £3.72	=	£6.38
¼ of 750 ml	=	190 ml
20% of 6.75 m	=	1.25 m

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move on

get on at work **Interpreting the answer**

3 people share £10 between them.
How much do they each get?

£10 ÷ 3 = £3.33333

3 people need to pay a taxi fare of £10 between them.
How much do they each pay?

£10 ÷ 3 = £3.33333

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move on

get on at work **Percentages, fractions and decimals**

$20\% = \frac{20}{100} = \frac{2}{10}$

1000	100	10	1	.	1/10	1/100
					2	0

12

move on

get on at work

Fractions and percentages

$\frac{3}{5} = \frac{\quad}{100} = \quad\%$

13

move on

get on at work

Fractions and decimals

$\frac{3}{5} = \_\_$

1000	100	10	1	.	1/10	1/100

$5\overline{)3.00}$

14

move on

get on at work

Using and improving your maths

Programme journal:

- What have you learnt?
- How might you use the skills in your working/everyday life?
- What do you want to practise more (if anything)?

15

move on


Move On contacts
get on
at work
with
move on
Move On web site
www.move-on.org.uk
BBC Skillswise
www.bbc.co.uk/skillswise
Key Skills Support
www.keyskills4u.com
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Module 7: Activity 1
Equivalencies matching cards (percentages, fractions and decimals)

1%	$\frac{1}{100}$	0.01
5%	$\frac{1}{20}$	0.05
10%	$\frac{1}{10}$	0.1
20%	$\frac{1}{5}$	0.2
25%	$\frac{1}{4}$	0.25
30%	$\frac{3}{10}$	0.3
40%	$\frac{2}{5}$	0.4
50%	$\frac{1}{2}$	0.5
60%	$\frac{3}{5}$	0.6
75%	$\frac{3}{4}$	0.75
80%	$\frac{4}{5}$	0.8
100%	1	1

Module 7: Activity 2
Sifting information

In each example below, underline or highlight any details that are ***not*** important for the calculation(s) you need to make.

Noah is making some shelves to go in a stock room.
He decides to use wood that is 2 cm thick and 20 cm deep for the shelves.
He needs to put up 5 shelves, each 120 cm wide.

What length of wood does he need altogether?

A care worker goes shopping for a resident. She spends £2.55 in the first shop.
In the next shop she gets some items that are reduced from £2.99 to only £1.99
How much has she spent in total?

If she set off with £20, how much change will she give the resident?

Two health care assistants want to save up for a holiday.
They each earn £270 a week and decide to put aside a regular amount of £30 a week from their wages over the next 10 weeks.

May saves the amount planned each week.
Nula only manages to save £25 per week. How much less than May has she saved at the end of the 10 weeks?

They see a holiday in the resort they want to go to, which is on offer at 25% off and now costs £360 for a 10 day break.

How much additional money does each need to be able to afford this holiday?

A carpenter is putting in a new kitchen. He has a cooker that is 65cm wide. The space on one side of the cooker is 100 cm and on the other side is 250 cm.

How many units 50 cm wide will fit on each side of the cooker?

Three friends go out for a meal together. The restaurant bill comes to £93 altogether, including a service charge of 10%.
How much will it cost each friend if they share the cost equally?

They get a taxi home costing £9.00. How much is this divided between them?

Module 7: Activity 3
Working out in several steps

Example 1:

Maya is supervising a project to make agreed changes to 5 bays in a ward and has been given a budget of £1,000 to complete the project.

She spends £135.50, £254.90, £144.50 and £115.10 on different elements that contribute to the changes needed.

How much of her original budget has she got left?

Example 2:

Maya is supervising a project to make agreed changes to 5 bays in a ward and has been given a budget of £1,000 to complete the project.

She spends £135.50, £254.90, £144.50 and £115.10 on different elements that contribute to the changes needed.

How much have the changes actually cost *per bay*?

Example 3:

Maya is supervising a project to make agreed changes to 5 bays in a ward and has been given a budget of £1,000 to complete the project.

She spends £135.50, £254.90, £144.50 and £115.10 on different elements that contribute to the changes needed.

How much more or less per bay did the refurbishments cost than the original budget provided?

A nurse is saving for one of his friends' stag weekend. He gets a bonus from work of £36.20 and then puts aside £12.50 a week. How long will it take him to save up for the weekend if he expects it to cost about £250?

A chef is hoping to buy a new car. She already has £645 that she can put towards the cost of the car. She sees a second hand car that she would like to buy costing £2,495. She asks her dad to help her out and he agrees to give her a loan of £1,200. If she saves for four weeks, how much will she need to save per week to collect up enough money to pay for the car she wants?

Module 7: Activity 4
Visualising the problem

Would a sketch or diagram help to visualise these situations?

(1) A ward is shown on a hospital building plan as 5 cm long.
Each cm on the plan represents 2 metres in the real hospital.
How long will the ward be?

(2) A ward is divided into five equal-sized bays and allocates two of the five bays for use by female patients.
If the ward is 12 m long altogether, how many metres long will the female section be?

(3) Three departments (A, B and C) share a funding allocation of £240,000 between them. They have 2, 3 and 1 clinics respectively.

(a) How much would each section get if the hospital divided the allocation equally between the clinics directly?

(b) If each department gets an equal share of the allocation and then divides their allocation equally between their clinics, how much would each clinic get?

(4) The Friends of the hospital have agreed to pay for some shelves to go in a patient rest room. The staff have decided that they want to put up 2 sets of shelves, 150 cm wide and 240 cm wide respectively.

(a) What length of wood will be needed altogether in metres to make these shelves?

(b) If the wood used comes in 390 cm lengths, how many lengths will be needed?

(5) A carpenter is putting a new kitchen into a nurse's accommodation block. The length of work surface he needs is 120 cm on one side of the cooker and 260 cm on the other. The work surface comes in lengths of 210 cm, 360 cm or 420 cm.
Which of these lengths would it be best for him to use?

Module 7: Activity 5
Interpreting the answer

For each of these questions, work out the answer and give the units that the answer is in

(a) Three friends win £240 between them.
If they share it equally, how much will they each get?

(b) Keith has £10 in his pocket.
How many items at 75p can he afford?

(c) Someone working in an office is leaving. The other 5 people in the office decide they want to buy her a leaving present.
The present they have in mind costs £32. How much do each of the office mates need to contribute?

(d) Mac wants to put aside some money every month to pay for his car road tax.
He needs to save up £96 over the year.
How much should he put aside each month?

(e) Bags of crisps come in multi-packs of 12 bags per pack, costing £2.76
How much is it per bag?

(f) Julie is putting up shelves, which are 120cm long.
How many will she get from a piece of wood 3.6 metres in length?

Collecting and sharing

(a) Three friends win £250 between them.
If they share it equally, how much will they each get?

(b) Someone working in a ward is leaving. The other 9 people in the ward decide they want to buy him a leaving present costing £14. How much do they each need to contribute?

(c) Four friends share a taxi costing £9.50 for a night out.
If they share the cost exactly equally, how much will they each need to pay?

(d) After a party, there are 29 cans of drink left over. The three friends who organised the party agree to share the cans between them. How many will they each take home?

Module 7: Handout 6
Using a problem-solving approach

You can think of the question in several stages:

- **making sense of the problem/situation**
- **choosing the right calculation**
- **making sense of the answer**
- **checking your answer.**

- **Making sense of the situation/question**
  - You can use your experience of the world to help you think about the question in practical everyday terms. What does it mean?
  - It might help to visualise the problem.
- **Choosing the right calculation**
  - Pick out the key information that you need to work out the right calculation.
  - Ignore any numbers or information that you do not need.
  - Decide whether to add (+), subtract (-), multiply (×) or divide (÷).
- **Making the calculation**
  - Remember, you may sometimes need to make several steps to calculate the answer.
  - You may need to use information that you already have (in the question) to work out information that you still need, to be able to work out the answer.
  - Take care with your calculations.
  - Write down key information and calculations clearly – it will help you to keep track of what you are doing.
- **Making sense of the answer**
  - Think about what your answer means.
  - Be especially careful about writing the answer down accurately, especially the size of the answer and the position of the decimal point (if there is one).
- **Recording your answer**
  - Write your answer clearly – it's no good getting the answer right if the person marking your test can't read what you've written!
  - Make sure that you write the answer to the question in the right place (with multiple choice questions in particular it can be easy to lose track of your place and so end up putting the answer to a question against the wrong question number on the answer paper).
- **Checking your answer**

Remember to check your answer if you have time.

- 'Checking back' methods can be particularly useful.
- Or, if you can, try getting to the answer in a different way from the one you used the first time (if you do exactly the same calculation as you did before, you might repeat any mistakes you made).

Module 7: Activity 7(a) How do percentages, fractions and decimals relate?

What are these fractions as a *percentage*?

¼

¾

½

What are these percentages as a fraction?

10%

1%

20%

What are these decimals:	**as a fraction**	**and as a percentage?**
0.25 (25 hundredths)		
0.5		
0.2		
0.6		

Can you think of any other ways to write each of the fractions?

Module 7: Activity 7(b) Percentages, fractions and decimal equivalencies dominoes

Start with any domino. Find another domino that will fit on one side or the other of this starting domino so that the two amounts next to each other are equivalents.

eg next to 50% you could put any of: 0.50 0.5 ½ 5/10 or 50/100.

(These are all equivalents of 50%). Use what you did in Activity 7a above to help you.

If you match the equivalents correctly, you should create a domino chain that makes a complete loop, so the last domino matches up with the first.

If you get back to the start but still have some dominoes left over, can you fit them into the chain somewhere?

1%	$\frac{1}{5}$	$\frac{2}{10}$	0.2
20%	$\frac{1}{10}$	0.10	$\frac{10}{100}$
10%	75%	$\frac{3}{4}$	50%
$\frac{1}{2}$	0.25	$\frac{50}{100}$	0.5
$\frac{1}{4}$	1	0.75	$\frac{75}{100}$
100%	$\frac{1}{100}$	$\frac{25}{100}$	25%

Module 7: Activity 7(c)
Writing percentages as fractions

Write the following percentages as fractions. Remember to cancel down where possible.

(a)	5%	(b)	60%
(c)	12%	(d)	55%
(e)	23%	(f)	10%
(g)	15%	(h)	25%
(i)	30%	(j)	50%
(k)	75%	(l)	80%
(m)	100%	(n)	40%
(o)	95%		

Module 7: Activity 7(d) Writing fractions as percentages

Activity 7d: Writing fractions as percentages

(a)	$\frac{2}{10}$	(f)	$\frac{14}{20}$
(b)	$\frac{4}{10}$	(g)	$\frac{240}{500}$
(c)	$\frac{16}{25}$	(h)	$\frac{36}{150}$
(d)	$\frac{32}{50}$	(i)	$\frac{60}{150}$
(e)	$\frac{3}{5}$	(j)	$\frac{40}{250}$

Module 7: Activity 7(e)
Writing fractions as decimals and percentages

Write these fractions as decimals and then as percentages.

(a)	$\frac{6}{8}$	(d)	$\frac{2}{8}$
(b)	$\frac{1}{6}$	(e)	$\frac{1}{3}$
(c)	$\frac{2}{3}$		

Module 7: Activity 8
Practice test questions (problem solving)

(1) An ambulance does 20 miles on each litre of petrol. Petrol costs £1.06 per litre.
Which calculation gives the total amount of petrol for the 480 miles travelled in a week?
(a) (480 ÷ 1.06) × 20
(b) (480 × 1.06) ÷ 20
(c) 480 ÷ 20
(d) 480 ÷ 1.06

(2) A swimmer goes swimming three times a week. It costs her 75p every time she goes.
How much does she spend in 6 weeks?
(a) £2.25
(b) £4.50
(c) £9.00
(d) £13.50

(3) There are 445 beds in a local hospital. Each bed has two clean bed sheets every day.
Which calculation will give the number of clean sheets needed in a week?
(a) 455 ÷ 7 ÷ 2
(b) 455 × 2 ÷ 7
(c) 455 ÷ 2 × 7
(d) 455 × 2 × 7

(4) A charity organises a dance. Two hundred and fifty people pay £1.50 each. How much do they pay altogether?
(a) £37.50
(b) £375.00
(c) £3,750.00
(d) £37,500.00

(5) There are six people in a lift. Their weights are 87.6 kg, 92.1 kg, 47.3 kg, 66.3 kg, 52.7 kg and 80.2 kg. What is their total weight in kg?

(a) 4.262
(b) 42.62
(c) 426.2
(d) 4,262.0

(6) A gas bill shows that 1720 units of gas have been used. Each unit costs 1.5p. How much does the gas cost?

(a) £2.58
(b) £25.80
(c) £258.00
(d) £2,580.00

(7) A pizza shop owner calculated that each home delivery took, on average, 15 minutes. How long would it take to make 10 deliveries?

(a) 1 hour 15 minutes
(b) 1 hour 30 minutes
(c) 2 hours 30 minutes
(d) 2 hours 45 minutes

(8) The table shows the prices of refreshments.

Refreshments	
Pasties	£2.00 each
Baked potatoes	£2.49 each
Sausage rolls	£1.50 each

One visitor buys one baked potato and two sausage rolls. The total bill is £5.49. Which reverse calculation can the visitor use to check the bill?

(a) £5.49 + £1.50 + £1.50 + £2.49
(b) £5.49 - £1.50 - £1.50 - £2.49
(c) £5.49 + £1.50 + £2.49 + £2.49
(d) £5.49 - £1.50 - £2.49 - £2.49

(9) A woman pays £9.56 each month for the electricity supply, plus £0.07 for every unit of electricity used. In one month she uses 392 units. Which is the correct way of calculating the bill for the month?

(a) 9.56 × (392 + 0.07)
(b) (9.56 × 0.07) + 3.92
(c) 9.56 + (392 × 0.07)
(d) 9.56 + (392 ÷ 0.07)

(10) A woman has £279.00 in her bank. She pays £259.50 into her bank account. She writes cheques from her bank account for £21.50 and £88.20. Which is the most accurate way of estimating how much is left in her account to spend?

(a) 12 + 250 – 20 -80
(b) 280 – 260 + 25 + 90
(c) 280 + 260 – 20 -90
(d) 300 + 300 – 30 – 100

(11) A group of 7 friends win a total lottery prize of £2 583. They get an equal share of £369 each. Which calculation can they use to check that this is correct?

(a) 369 × 7
(b) 2,583 × 7
(c) 369 ÷ 7
(d) 2,583 × 369

Module 7: Practice test questions

Try to answer all the questions.

Time yourself and try to complete them within about 45 minutes if possible.

(1) Eight friends go to a firework display. The table shows the entry cost.

Entry cost	
Adult (16 years or over)	£5.00
Children (aged 2 years and under 16 years)	£3.00
Infants (under 2 years)	FREE

Six of the friends are 16 years old. Two of them are 15 years old. What is the total entry cost for the friends?

(a) £28.00
(b) £30.00
(c) £36.00
(d) £40.00

(2) A nurse sees 24 patients. She weighs ¾ of these patients. How many patients does she weigh?

(a) 6
(b) 8
(c) 16
(d) 18

(3) A builder has a contract to build 25 houses. He orders 2 356 bags of cement.
How many bags of cement is this to the nearest 10?

(a) 2,300
(b) 2,350
(c) 2,360
(d) 2,400

(4) A concert ticket costs £30. The organisers donate 2/5 of this to charity. The amount of money donated from each ticket sale to charity is:

(a) £6
(b) £10
(c) £12
(d) £18

(5) The organisers employ 250 security guards. The security guards are each paid £7 an hour. They each work 5 hours. The total amount paid for the security guards is:

(a) £875
(b) £1,750
(c) £7,500
(d) £8,750

(6) A supermarket has 900 customers in one day. 60% of these buy milk. How many customers buy milk?

(a) 150
(b) 360
(c) 540
(d) 600

(7) A manicure costs £15. There is a 20% reduction in the cost every Wednesday. How much does a manicure cost on a Wednesday?

(a) £3
(b) £5
(c) £10
(d) £12

(8) A club's records show that two-fifths of members are over 30 years of age. Two-fifths as a percentage is:

(a) 12%
(b) 20%
(c) 25%
(d) 40%

(9) A club member weighs 56.8 kilograms. What is her weight to the nearest kilogram?

(a) 50kg
(b) 56kg
(c) 57kg
(d) 60kg

(10) It costs £21.50 each day for a family to hire a car. The family hire a car for 5 days. How much does it cost?

(a) £105.00
(b) £105.25
(c) £105.50
(d) £107.50

(11) A family spend 30% of their money on food. 30% written as a fraction is:

(a) $\frac{3}{100}$

(b) $\frac{3}{10}$

(c) $\frac{1}{3}$

(d) $\frac{100}{30}$

(12) A customer's car needs a major service at 48,000 miles. A car has done 33,650 miles. How many miles can it travel before the major service is needed?

(a) 14,350
(b) 14,450
(c) 15,350
(d) 15,650

(13) Viewers can pay extra to receive the sports channel. 75% of viewers do not pay extra for the sports channel. What fraction of viewers pay extra for the sports channel?

(a) ¼
(b) ⅓
(c) ½
(d) ¾

(14) A television channel broadcasts a total of 15 hours of programme a day. It broadcasts 3 hours of children's programmes a day. What percentage of the programmes are children's programmes?

(a) 3%
(b) 5%
(c) 15%
(d) 20%

(15) A household pays £384.00 for electricity in a year. They pay in 12 equal monthly instalments. How much do they pay each month?

(a) £29.60
(b) £32.00
(c) £38.40
(d) £42.00

(16) A neighbour pays £402.00 for electricity in a year. She can save 20% by changing supplier. How much can she save in a year by changing supplier?

(a) £8.04
(b) £20.10
(c) £40.20
(d) £80.40

(17) A train ticket costs £8.31. With a railcard, there is a discount of 1/3 off ticket prices. How much is the discount?

(a) £2.10
(b) £2.49
(c) £2.77
(d) £2.87

(18) 145,000 people buy tickets in a lottery. One-tenth of tickets win a prize. Another way of writing one-tenth is:

(a) 0.1%
(b) 1%
(c) 10%
(d) 100%.

(19) A cook at a home provides meals for 80 people. 30% of the people have a special diet meal. How many of the people have a special diet meal?

(a) 24
(b) 30
(c) 50
(d) 56

(20) The cook earns £5.90 an hour. How much does she earn for 40 hours' work?

(a) £206.00
(b) £203.60
(c) £236.00
(d) £239.00

Activity 5: Interpreting the answer

The answers including units are:
(a) £80
(b) 13 items
(c) £6.40
(d) £8
(e) 23p
(f) 3 shelves.

Collecting and sharing

(a) £83.33
(b) £1.56
(c) £2.38
(d) 9 cans

Activity 7a: How do percentages, fractions and decimals relate?

Fractions as percentages:
¼ = 25%
¾ = 75%
½ = 50%

Percentages as fractions:
10%=1/10 or 10/100
1%=1/100
20%=1/5 or 20/100 or 2/10

What are these decimals:	as a fraction	and as a percentage?
0.25 (25 hundredths)	¼	25
0.5	5/10 *or* 50/100 *or* ½	50%
0.2	2/10 *or* 20/100 *or* 1/5	20%
0.6	6/10 or 60/100	60%

Activity 7c: Writing percentages as fractions

The percentages as fractions are:

(a)	1/20	(b)	3/5
(c)	3/25	(d)	11/20
(e)	23/100	(f)	1/10
(g)	3/20	(h)	1/4
(i)	3/10	(j)	1/2
(k)	3/4	(l)	4/5
(m)	1	(n)	2/5
(o)	19/20		

Activity 7d: Writing fractions as percentages

(a)	20%	(f)	70%
(b)	40%	(g)	48%
(c)	64%	(h)	24%
(d)	64%	(i)	40%
(e)	60%	(j)	16%

Activity 7e: Writing fractions as decimals and percentages

The fractions as decimals and percentages are:

(a)	0.75, 75%	(d)	0.25, 25%
(b)	0.1666, 16.7%	(e)	0.333, 33.3%
(c)	0.666, 66.7%		

Activity 8: Practice test questions (problem solving)

(1) c
(2) d
(3) d
(4) b
(5 c
(6) b
(7) c
(8) b
(9) c
(10) c
(11) a

Practice test questions

(1) C
(2) D
(3) C
(4) C
(5) D
(6) C
(7) D
(8) D
(9) C
(10) D
(11) B
(12) A
(13) A
(14) D
(15) B
(16) D
(17) C
(18) C
(19) A
(20) C