Number 2

contents

There are nine lessons in this unit, **Number 2**.

objectives

The objectives covered in this unit are:

- Read and write whole numbers in figures and words.
- Multiply and divide integers by 10 and 100.
- Recall multiplication facts to 10 × 10 and derive associated division facts.
- Use mental methods to double and halve two-digit numbers and to calculate TU × U and TU ÷ U.
- Use written methods to calculate HTU × U, TU × TU and HTU ÷ U.
- Check whether a result is the right order of magnitude.
- Round up or down after division, depending on the context.
- Use fraction notation to describe parts of shapes.
- Count on and back in halves, fifths and quarters, and in steps of 0.1 and 0.01.
- Recognise when two simple fractions are equivalent.
- Understand and use decimal notation and place value.
- Compare and order decimals.
- Find fraction and decimal equivalents in simple cases, including for tenths and hundredths.
- Find simple fractions of whole-number quantities.
- Use a calculator to convert simple fractions to decimals, and interpret the display.
- Compare two simple fractions by using a diagram.

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Using the lesson plans in this unit

These lesson plans supplement the *Springboard 7* materials for Key Stage 3 pupils working toward level 4 in mathematics. All the lessons are examples only. There is no requirement to use them. If you decide to use the lessons, you will need to prepare overhead projector transparencies (OHTs) and occasional resource sheets for pupils to use.

The lessons consolidate work at level 3 and extend into level 4. They are suitable for a group of pupils or a whole class. Whatever the size of the group, the pupils are referred to as 'the class'.

Each lesson will support about 30 to 40 minutes of direct teaching. To help match the time to your timetable, each plan refers to 'other tasks' for pupils, based on *Springboard 7* resources. Select from these, textbook exercises or your own materials to provide practice and consolidation in the main part of a lesson and to set homework. Aim to choose tasks that vary in their level of demand, to suit pupils' knowledge, confidence and rate of progress.

Although the 'other tasks' are listed for convenience at the end of the main part of the lesson, they can be offered at any point, especially between the 'episodes' that form the main activity.

The lesson starters are of two kinds: practice starters and teaching starters. The former are opportunities to rehearse skills that will be needed later in the lesson. Teaching starters introduce an idea that is then developed in the main activity.

You will need to tell pupils what they will learn in the lesson, either in the starter or at the beginning of the main activity. Use the plenary to check pupils' learning against the lesson's objectives and to draw attention to the key points that pupils should remember.

Interactive teaching programs (ITPs)

Interactive teaching programs are interactive animated visual aids that can be used with a laptop and data projector or with an interactive whiteboard. As extra support for this unit, you may find it useful to download and use these ITPs from the website www.standards.dfes.gov.uk/numeracy:

for lesson N2.1: *Multiplication grid*

for lesson N2.2: *Grouping*
Division grid

for lesson N2.3: *Fractions*
Area

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N2.1 HTU × U and TU × TU

objectives

- Multiply and divide integers by 10 and 100.
- Calculate mentally TU × U.
- Use written methods to calculate HTU × U and TU × TU.
- Check whether a result is the right order of magnitude.

starter

Vocabulary
times
multiplied by
product
multiple

Resources
mini-whiteboards

Remind the class that, when a whole number is multiplied by 10, the digits move one place to the left and the units place gets filled with 0. Chant the ten times table (one ten is ten, two tens are twenty, …). Ask:

Q What number is the same as fifteen tens?

Explain that fifteen tens is 10 × 15 or 15 × 10, which is one hundred and fifty. Write 10 × 15 = 150 on the board.

Q What number is the same as forty-six hundreds?

Explain that this is 100 × 46 or 46 × 100, which is four thousand six hundred. Write 100 × 46 = 4600 on the board.

Q What number is the same as thirty hundreds?

Explain that this is 100 × 30 or 30 × 100, which is three thousand. Write 100 × 30 = 3000 on the board. Point out that in each case the total number of zeros at the ends of the two numbers is the same as the number of zeros at the end of their product; this is a useful check. Check that it works also for thousands: work out twenty thousands and check the final zeros.

Write on the board some multiples of 10 and 100, such as 50, 300, 70, 800, 90, 400. Point to 50, saying: 'Let's multiply 50 by 3. Five tens multiplied by three is fifteen tens – that's one hundred and fifty.' Check that the final zeros are the same.

Repeat with 300 multiplied by 3: three hundreds multiplied by three is nine hundreds. Check that the final zeros correspond.

Ask the class to multiply the other numbers by 3, and to write the answers on their whiteboards. Repeat by multiplying each number by 4 and then by 7.

Point again to the 50, asking:

Q How could you multiply 50 by 30?

Explain that 50 × 30 is the same as 5 × 10 × 3 × 10, which can be rearranged as 5 × 3 × 10 × 10, or 5 × 3 × 100. So multiply 5 by 3, then multiply the answer by 100. Practise multiplying a few more multiples of 10, such as 40 × 60, 50 × 70.

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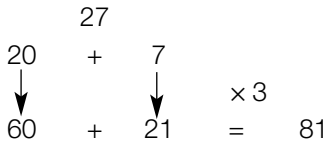
main activity

Vocabulary
multiplication

Resources
mini-whiteboards
ITP *Multiplication grid* (optional)

Show how to partition to calculate mentally a product such as 27 × 3. Split the larger number, jot down each part and multiply it by 3.



Practise a couple of examples, such as 14 × 4, 28 × 5.

Write 43 × 20 on the board.

Q Can you work this out and explain how you did it?

Establish that 43 × 20 = 43 × 2 × 10, and that 20 has been replaced by 2 × 10. So 43 × 20 = 43 × 2 × 10 = 86 × 10 = 860.

Write on the board 43 × 60.

Q What can we multiply 43 by this time?

Show that 60 is the same as 6 × 10, so that 43 × 60 = 43 × 6 × 10. Ask pupils to work out the answer on their whiteboards. Then ask them to work out 43 × 30, 43 × 40 and 43 × 50.

You could, if you wish, use the ITP *Multiplication grid* downloaded from www.standards.dfes.gov.uk/numeracy to teach multiplication in this part of the lesson. Select options and ask questions similar to those below.

Write on the board 384 × 5.

Q How can we make a mental estimate of the answer? (e.g. 400 × 5)

Q Will the real answer be more or less than 2000? (less)

Demonstrate a method for multiplying a three-digit number by a single digit, setting out the numbers in a grid. Work with the class to complete the grid.

×	300	80	4
5			

×	300	80	4
5	1500	400	20

Help pupils to add the three numbers produced, either mentally, as is possible in this case, or by writing them in columns. Compare the answer with the estimate. Repeat for one or two more examples.

Continue with this extension if you consider it appropriate for your pupils. Write 35 × 47 on the board.

Q How can we estimate the answer?

Take pupils' estimates and explanations. Include estimates of 40 × 50 and 30 × 50.

Q Which do you think would be the better estimate? Why?

Explain that for 40 × 50 = 2000, each number has been made bigger. With 30 × 50 = 1500, one number has been made bigger and the other smaller, so the estimate may be closer.

Demonstrate on the board, using partitioning, and setting out the numbers in a grid. Complete the grid with the pupils to get the grid on the right.

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×	30	5
40		
7		

×	30	5
40	1200	200
7	210	35
	1410	235

Q Which boxes were easy to fill in? Why?
Q How can we get the answer to 35 × 47 from the grid?

Establish that 1410 and 235 must be added, if necessary using column addition, to obtain the answer of 1645. Check against the estimates. Repeat for one or two more examples.

other tasks

Springboard 7
Units 6, 10 and 15

Unit 6 section 5: Multiplication
4 Multiplication for HTU × U page 232

Unit 10 section 2: Multiplication
1 Multiplication page 332
Star challenge 3: Solving problems page 334
Star challenge 5: Different totals page 335

Unit 10 section 5: Rounding numbers
Star challenge 11: Rounding to the nearest 10 or 100 page 347

Unit 15 section 1: Mental calculations – multiplication
1 Using related number facts page 475

Unit 15 section 3: Multiplication – written methods
2 HTU × U 3 TU × TU page 482

plenary

Resources
OHT N2.1a

Work through one or more of the problems on **OHT N2.1a**. Ask questions such as:

Q What is the question asking us to calculate?
Q What are the key words in the question?
Q Which operation shall we use?
Q What is the approximate answer?
Q How shall we show our working?
Q Does the answer make sense in the context of the question?

Make sure that pupils can explain the key steps in the calculation.

Remember

- To calculate mentally a product such as 18 × 6, split the 18 into 10 and 8, and multiply each part by 6.
- To multiply by a multiple of 10, such as 70, multiply by 7, then multiply by 10.
- To multiply a multiple of 10 such as 40 by a multiple of 10 such as 50, first multiply 4 × 5, then multiply by 10 × 10 or 100.
- When you calculate HTU × U or TU × TU, estimate the answer first. Set out the calculation carefully. Check the answer against the estimate.

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N2.2 HTU ÷ U (whole-number answers)

objectives

- Recall multiplication facts to 10 × 10 and derive associated division facts.
- Calculate mentally TU ÷ U.
- Use a written method to calculate HTU ÷ U.
- Check whether a result is the right order of magnitude.
- Round up or down after division, depending on context.

starter

Vocabulary
times
multiplied by
divided by
product
multiple
remainder
squared

Resources
mini-whiteboards

As a class, chant the three times table, forwards and backwards. Ask a few random questions, varying the wording. Ask the class:

Q Which statements in the three times table are easy to remember? Why? Which are harder to remember? (e.g. 3 × 7, 3 × 8)

Repeat the 'harder' facts three times each.

Ask a few random questions related to the table, varying the wording.

Q What is 9 times 3?

Q What is 27 divided by 3?

Q What is the product of 6 and 3?

Q What is 3 squared?

Q What is 3 multiplied by 8?

Q What is the next multiple of 3 after 30? How did you work it out? (add 3 to 30)

Q How many threes are there in 21?

Q What is the remainder when 29 is divided by 3?

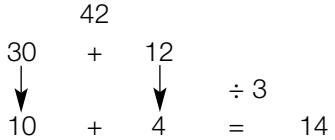
main activity

Vocabulary
problem
calculation
division
factors

Resources
OHT N2.2a
ITP *Grouping* (optional)

You could, if you wish, introduce the main activity by using the ITP *Grouping* downloaded from www.standards.dfes.gov.uk/numeracy.

Write 42 ÷ 3 on the board. Show the class how to partition to calculate this mentally. Split the first number into a multiple of 10 that is an exact multiple of the divisor 3, plus the rest. So 42 is split into 30 + 12, then each part is divided by 3.



Practise some examples, such as 68 ÷ 4 (splitting 68 into 40 + 28) and 90 ÷ 6 (splitting 90 into 60 + 30).

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Write this problem on the board, or prepare it on an OHT.

There are 6 stamps on every card of self-adhesive stamps.
John bought a total of 138 stamps.
How many cards of stamps did John buy?

Ask pupils to work in pairs for a few minutes to try to answer the problem, then take feedback.

Establish that we need to know how many sixes there are in 138, or 138 ÷ 6, and that the answer to this problem will be a whole number bigger than 20 (enough cards for 120 stamps) and less than 30 (enough cards for 180 stamps). It will be closer to 20 than to 30 because 138 is closer to 120 than to 180. Illustrate this if necessary by drawing an empty number line, marking the multiples of 10 from 120 to 180, and pointing out the position of 138. One way to work out the answer would be to keep subtracting six stamps but that this might take a long time. It would be easier to take away 60 stamps for 10 cards in one go, and then see what is left.

Write on the board:

138 ÷ 6

138	
60	6 × 10
78	
60	6 × 10
18	
18	6 × 3
0	

Q How many lots of 6 stamps have we taken away? (10 + 10 + 3 = 23)

Establish that the answer to 138 ÷ 6 is 23.

Show pupils how the calculation could be made more efficient by subtracting 120 stamps all at once.

138 ÷ 6

138	
120	6 × 20
18	
18	6 × 3
0	

Demonstrate an example with a remainder, such as 140 ÷ 6, recording the answer as 23 r 2. Discuss with the class how to deal with the remainder in the context of two different problems.

A baker packs cakes in boxes of 6.
The baker has baked 140 cakes.
How many boxes can the baker fill?

Eggs are packed in boxes of 6.
Some chickens have laid 140 eggs.
How many boxes will be used to pack all the eggs?

Explain that in the first problem the answer will be a whole number of boxes. 140 ÷ 6 is 23 r 2. The answer will need to be rounded down to 23, the number of full boxes

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of cakes. In the second problem, the answer will again be a whole number of boxes, but in this case the answer must be rounded up to 24. 23 of the boxes will hold 6 eggs, and one box will hold 2 eggs. Stress to pupils that they need to think about the context of the problem before they round up or down.

Work through the problems on **OHT N2.2a**. Ask questions such as:

Q What is the question asking us to calculate?
Q What are the key words in the question?
Q Which operation shall we use?
Q What is the approximate answer?
Q How shall we show our working?
Q Should the answer be rounded up or down in the context of the question?

Make sure that pupils can explain the key steps in the calculation.

other tasks

Springboard 7
Unit 10

Unit 10 section 3: Division

1	Division using related multiplication facts	page 338
2	Division	page 338
3	Estimate then work out	page 339
Star challenge 7: Increasing in difficulty		page 339

Unit 10 section 4: Division II

Star challenge 9: Word problems		page 342

plenary

Resources
OHT N2.2b
ITP *Division grid* (optional)

You could, if you wish, use the ITP *Division grid* downloaded from www.standards.dfes.gov.uk/numeracy to support the plenary of this lesson. Select options and ask questions to consolidate pupils' understanding.

Show **OHT N2.2b**, and complete with the class the first multiplication table.

Show the second multiplication table and ask pupils to study it in pairs. Tell them that the task is to fill in all the blank spaces in the table. If they have difficulty in getting started, suggest that they think about the possible factors of 21 in the bottom right corner of the table.

After a few minutes, take feedback, and work through the solution. Emphasise that using knowledge of multiplication and division facts helped to eliminate or confirm possible values, and that to solve the whole puzzle required systematic working.

Remember

- To calculate mentally 56 ÷ 4, split the first number into a multiple of 10 that is an exact multiple of the divisor 4, plus the rest. So 56 is split into 40 + 16, then each part is divided by 4.
- When you calculate HTU ÷ U, estimate the answer first. Set the calculation out carefully and work systematically and efficiently. Check the answer against the estimate.
- Check that the answer to a division calculation makes sense in the context of the problem. Think carefully whether it should be rounded up or down.

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N2.3 Understanding fractions

objectives

- Recall multiplication facts to 10 × 10 and derive associated division facts.
- Use fraction notation to describe parts of shapes.
- Recognise when two simple fractions are equivalent.

starter

Vocabulary
fraction
whole
eighth

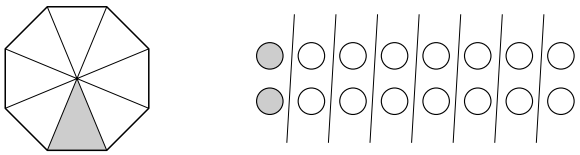
Revise multiplication and division facts from the eight times table. Chant the table, then ask:

Q What is 80 divided by 8?

Q How many eights in 24? In 56?

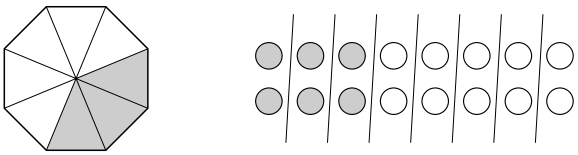
Q Eight people share £40 equally among them. How much does each person get?

Explain that if we split or divide something into eight equal parts, each part is called one eighth. Write $\frac{1}{8}$ on the board. To find one eighth of a shape, it is divided into eight equal parts. To find one eighth of a number, the number is divided by 8. Illustrate with diagrams.



Q What is one eighth of 16? Of 32? Of 72?

Now shade three eighths on the diagrams, and write $\frac{3}{8}$ beside them.



Q What is three eighths of 16? Of 32? Of 72?

Explain that there are eight eighths in one whole. Write these statements on the board and complete them with the class.

a. $\frac{3}{8} + \frac{5}{8} = \ldots$

b. $\frac{4}{7} + \frac{3}{7} = \ldots$

c. $\frac{4}{5} + \ldots = 1$

d. $\ldots + \frac{5}{9} = 1$

e. $1 - \frac{5}{6} = \ldots$

f. $1 - \frac{2}{9} = \ldots$

g. $1 - \ldots = \frac{2}{7}$

h. $\ldots - \frac{1}{8} = \frac{7}{8}$

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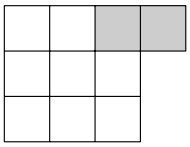
main activity

Vocabulary
third
sixth
twelfth
fifth
tenth

Resources
squared paper
coloured pens
OHTs N2.3a, N2.3b, N2.3c, N2.3d
ITP *Area* (optional)

You may wish to support this part of the lesson by using the ITP *Area* downloaded from www.standards.dfes.gov.uk/numeracy. Ask questions similar to those below.

Draw on the board a shape made from 10 squares (e.g. a 3 by 3 square, with one more stuck on an edge). Colour a group of two adjacent squares.



Ask:

Q How many groups of two squares are there in the whole shape? (five)

Q What fraction of the whole shape is one group of two squares? (one fifth)

Point out that the shape can be split into five equal parts and that each part is one fifth.

Q How many tenths are equivalent to one fifth? (two) **To two fifths?** (four) **To four fifths?** (eight)

Show the class the first counting stick on **OHT N2.3a**.

Q How many sections or intervals does the stick have?

Q What fraction of the whole stick is one of these intervals? (one tenth)

Q What fraction of the whole stick is two intervals? (two tenths) **Is there another way of describing this fraction?** (one fifth)

Label one end of the stick 0 and the other 1. Point to the halfway point.

Q How should this point be labelled? ($\frac{1}{2}$)

Invite pupils to the projector to label the points for one tenth, three tenths, seven tenths and nine tenths.

Q Which point on the stick should be labelled four fifths? Two fifths? Three fifths? One fifth?

Indicate the second counting stick on **OHT N2.3a**. Explain that this stick runs from 0 to 30, and label each end accordingly. Ask:

Q What is each interval worth? (3)

Count along the stick in threes from 0 to 30, then back again to 0.

Q Where does the label for one half go? What number is this? (15)

Q Where does the label for one tenth go? What number is this? (3)

Q Where does the label for seven tenths go? What number is this? (21) **Explain why.**

Q Where does the label for two fifths go? What number is this? (12) **Explain why.**

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Ask pupils to outline a 'stick' of 12 squares on squared paper. They should:

- colour blue one quarter of the 12 squares;
- colour red one sixth of the 12 squares;
- colour green one third of the 12 squares.

Tell them to hold up what they have done at each stage. Then say:

Q What fraction of the whole shape is blank?

Establish that three twelfths or one quarter of the 12 squares are blank.

Q What fraction of the whole shape is red or green? (six twelfths or one half)

Work through the questions on **OHTs N2.3b**, **N2.3c** and **N2.3d**. Stress the importance of clear explanations. Show pupils what they would write as an explanation if they were answering a test question.

other tasks

Springboard 7
Unit 5

Unit 5 section 1: Fractions

plenary

Resources
mini-whiteboards
ITP *Fractions* (optional)

Ask some questions about parts of a whole, for pupils to answer using their whiteboards.

Q How else could we write five tenths? Two eighths?
Q How many eighths are there in three quarters?
Q How many quarters are there altogether in 2?
Q What is one half added to three quarters?
Q Subtract one and a quarter from 2.
Q How many sixths are there altogether in one and a half?

After each question, invite a pupil to the board to illustrate the answer using diagrams.

You may wish to support the plenary of this lesson by using the ITP *Fractions*. Select options and ask questions to consolidate pupils' understanding of the equivalence of simple fractions.

Remember

- A fraction taken from a shape and the fraction remaining make up one whole. For example, if three eighths of a shape is shaded, then five eighths is unshaded.
- Some fractions can be written more simply. For example, five tenths, four eighths, three sixths and two quarters are all the same as one half; nine twelfths and six eighths are the same as three quarters.

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N2.4 Simple fractions of whole-number quantities

objectives

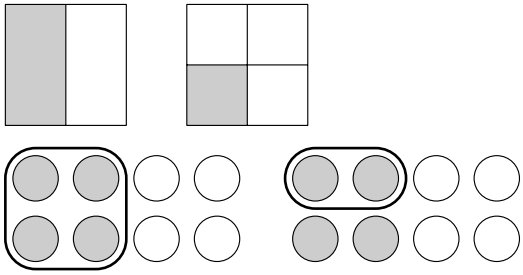
- Recall multiplication facts to 10 × 10 and derive associated division facts.
- Use mental methods to double and halve two-digit numbers.
- Find simple fractions of whole-number quantities.

starter

Vocabulary
half
quarter
double
halve

Resources
OHP calculator
mini-whiteboards

Draw diagrams to remind the class that to find one half of a *shape*, it is cut into two equal parts; to find one quarter of the shape, it is cut into four equal parts. One quarter is one half of one half of the shape. To find one half of a *number*, it is divided by 2. To find one quarter of the number, it is divided by 4. One quarter is one half of one half of the number.



Rehearse finding some halves of two-digit numbers mentally. Ask:

Q What is half of 24? How did you work it out? (divide 24 by 2, or halve it)

Q Half of a number is 18. What is the number? How did you work it out? (multiply 18 by 2, or double it)

Use an OHP calculator. Find one quarter of 128 by dividing by 4. Note 32 on the board. Now find one quarter of 128 by finding one half (128 ÷ 2 = 64), then finding one half again (64 ÷ 2 = 32). Stress that each method gives the same result. Repeat with finding one quarter of 468 and 292.

Ask pupils to use their whiteboards to find one quarter of 48 by finding one half of one half, jotting down interim results as necessary. Repeat with 100 and 212.

Ask pupils how they could tackle the following question.

Q One quarter of a number is 15. What is the number? How could you work it out? (multiply 15 by 4, or double it and double again)

Q How could we find one eighth of a number?

Establish that you could divide by 8, or you could halve, halve again, and then halve again. Practise finding one eighth of 112 by repeated halving, jotting down interim results. Repeat with 1000.

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main activity

Vocabulary
whole
fraction
third
sixth
twelfth

Revise multiplication and division facts from the six times table. Chant the table, then ask:

Q What is 60 divided by 6?

Q How many sixes in 24? In 48?

Q Six people share £30 equally among them. How much does each person get?

Remind the class that if we split or divide something into six equal parts, each part is called one sixth. To find one sixth of a shape, it is divided into six equal parts. To find one sixth of a number, the number is divided by 6. Ask:

Q What is one sixth of 12? Of 36? Of 54?

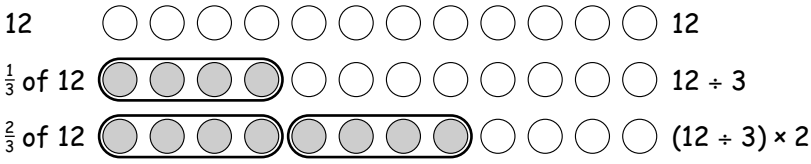
Q What do we need to do to find one fifth of a number? One tenth? One hundredth?

Q One ninth of a number is 6. What is the number? How did you work it out?

Present the class with this problem.

Max has 12 cherries.
He eats two thirds of them.
How many cherries does he eat?

Use a diagram to demonstrate how to solve the problem.



Write the calculation on the board, step by step.

$\frac{1}{3}$ of 12 = 12 ÷ 3 = 4

$\frac{2}{3}$ of 12 = ($\frac{1}{3}$ of 12) × 2 = 4 × 2 = 8

Stress that to find two thirds, you first find one third, then multiply by 2. Work through a similar problem, again drawing a diagram.

Rupee has saved £18.
She spends $\frac{5}{6}$ of the £18.

How much does Rupee spend?
What fraction of the £18 does she have left?

Work through one more problem, this time focusing on the calculations.

Robert has 560 stamps in his collection.
He gives seven tenths of them to his sister.

How many stamps does Robert give to his sister?
What fraction of the 560 stamps does he have left?

Write 40 on the board. Ask:

Q What fraction of 40 is 10? Can you explain why? (40 divided by 4 is 10)

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Write on the board: $\frac{1}{4}$ of 40 is 10.

Q How would you find three quarters of 40? (multiply 10 by 3)

Write on the board: $\frac{3}{4}$ of 40 is 30.

Q What other fractions of 40 can you find?

As pupils make suggestions, write them on the board: for example, $\frac{2}{5}$ of 40 is 16, $\frac{3}{10}$ of 40 is 12, $\frac{1}{40}$ of 40 is 1, and so on. For each suggestion, ask:

Q How did you work that out?

Repeat with 36.

Write 24, 30, 48 and 72 on the board. Ask pupils to work in pairs and to choose one of the four numbers. They should write as many fraction statements as they can about that number.

other tasks

Springboard 7
Units 5 and 13

Unit 5 section 4: Common fractions and decimals

Unit 13 section 1: Fractions of quantities

plenary

Resources
mini-whiteboards

Ask a series of questions about finding fractions of quantities, asking pupils to answer using their whiteboards for jottings.

Q What is one quarter of £1 in pence?
Q What is two thirds of £45?
Q What is three tenths of 60 minutes?
Q How many grams is one quarter of a kilogram?
Q What is three quarters of one metre in centimetres? In millimetres?
Q How many millilitres is one eighth of a litre?

After each question, invite one or more pupils to explain how they worked out the answer. Remind pupils that the relevant units should be included in their answers.

Remember

- One way to find one quarter is to find one half of one half.
- To find three quarters, work out one quarter, then multiply one quarter by 3.
- Find fractions with a numerator of 1 by dividing: e.g. find $\frac{1}{8}$ of a number by dividing it by 8. Check answers by multiplying to get back to the original number: e.g. check $96 \div 8 = 12$ with $12 \times 8 = 96$.

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N2.5 Decimal notation and place value

objectives

- Read and write whole numbers in figures and words.
- Understand and use decimal notation and place value.
- Count on in steps of 0.1 and 0.01.

starter

Vocabulary
value
digit
zero
nought

Resources
mini-whiteboards

Write 87 063 on the board. Ask the class to read the number aloud in words. Discuss the value of different digits.

Q What is the value of the digit 6? Of the 8?

Q Why is there a zero or nought in the hundreds column?

Explain that 'zero' and 'nought' are used interchangeably, and that the zero is used as a place holder.

Q What number is 100 more than 87 063? 100 less than 87 063?

Talk through writing 86 963 in an expanded form. Use this to help correct any errors in pupils' answers.

86 963 = 80 000 + 6000 + 900 + 60 + 3

Now ask pupils to write these numbers in figures on their whiteboards:

- nine thousand three hundred;
- fourteen thousand and six;
- one hundred and twenty thousand and thirty.

Check and correct errors by writing numbers in an expanded form.

Ask a few questions about adding and subtracting small numbers across multiples of 10, 100 and 1000. For example:

Q What is three more than one hundred and ninety-eight? Two less than five thousand and one?

main activity

Vocabulary
decimal place
tenth
hundredth
thousandth

Resources
mini-whiteboards
calculators
OHP calculator

Write 63.47 on the board. Ask pupils to read the number aloud in words (sixty-three point four seven). Remind them that the first place after the decimal point is called the first decimal place and is for tenths; the second decimal place is for hundredths. Ask:

Q What is the value of the digit 3? Of the 6? Of the 4? Of the 7?

Stress that the part of the number before the decimal point is the whole-number part and is read in the same way as a whole number. The part after the decimal point is the decimal fraction, and is read digit by digit.

Q How would we write 63.47 in expanded form?

63.47 = 60 + 3 + 0.4 + 0.07

Read this aloud together, pointing as you go: sixty-three point four seven equals sixty plus three plus four tenths plus seven hundredths.

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Write 46.05 on the board. Ask pupils to read the number aloud in words (forty-six point nought five). Say that some people might say forty-six point zero five. Discuss the value of different digits.

Q What is the value of the digit 6? Of the 4? Of the 5?

Q Why is there a zero in the tenths column?

Q How would we write and read 46.05 in expanded form?

(46.05 = 40 + 6 + 0.05)

Reinforce by writing on the board 20.6, 2.06 and 0.206. Ask pupils to read each number aloud. Point out that the third place after the decimal point is for thousandths. Discuss the part played by the zeros in each number, and write and read each of the numbers in expanded form.

Ask pupils to write these numbers in figures on their whiteboards:

- ten point nought three;
- one hundred and six point nought four;
- nought point five nought two.

Check and correct errors by writing the numbers in an expanded form.

Now write on the board a target number such as 68.47, and these numbers:

10 1 0.1 0.01

Point to one of them (e.g. 10) and start the class counting in multiples of that number: for example, ten, twenty, thirty, forty, … Call 'Stop!', point to one of the other numbers (e.g. 0.1, one tenth), and continue counting: forty point one, forty point two, forty point three, … Call 'Stop!', point to one of the other numbers (e.g. 0.01, one hundredth), and continue counting: forty point three one, forty point three two, forty point three three, … Call 'Stop!', point to the last of the four numbers (1), and continue counting: forty-one point three three, forty-two point three three, and so on. Call 'Stop!' again, and remind pupils of the target number.

Q What shall we count in to reach the target number: tens, units or ones, tenths or hundredths?

Choose a pupil to call 'Stop!', and continue counting as suggested by the class. Repeat the question above each time 'Stop!' is called until the target number is reached. If appropriate, extend to thousandths.

Repeat the activity by counting down from a target number to zero.

Ask pupils to enter two hundred and four point seven two into their calculators. Check that all pupils have entered the correct number by demonstrating on the OHP calculator. Then ask:

Q What is one tenth more than the number in your display? What do you think the display will show? What keys should you press?

Q What is one hundredth more than the number that is now in your display?

Make sure that pupils know that to add one tenth they key in + 0.1, and to add one hundredth they key in + 0.01. Read aloud the new number. Then ask:

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Q What is three tenths more than the number now in your display? What will the display show next? What is one and two tenths more? Four hundredths more?

Ask pupils to clear the display and enter twenty point nought six. This time ask:

Q What is one tenth less than the number in your display? What do you think the display will show? What keys should you press?

Q What is one hundredth less than the number that is now in your display? Two tenths less? Three hundredths less? One and four tenths less?

Repeat with:

- nought point nine;
- four thousand and thirty point nought eight.

other tasks

Springboard 7
Units 5 and 13

Unit 5 section 3: Decimals
Star challenge 4: Decimal sequences page 187

Unit 13 section 4: Ordering fractions and decimals
Star challenge 7: Decimal sequences page 434

plenary

Resources
mini-whiteboards

Write on the board: 14.99, 7.01, 13.9.

Point to one of the numbers and ask pupils to read it aloud (e.g. fourteen point nine nine). Point to particular digits.

Q What is the value of this digit?

Invite a pupil to the board to write the number in expanded form. Ask the class to read it aloud (e.g. fourteen and nine tenths and nine hundredths). Then ask them to write on their whiteboards the number that is one tenth more, one tenth less, one hundredth more, one hundredth less.

Repeat with the other two numbers.

Remember

- The decimal point separates the whole number from the decimal fraction.
- Each digit in a decimal number has a value, according to its position.
- The first decimal place is for tenths, the second decimal place is for hundredths, the third decimal place is for thousandths, and so on.

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N2.6 Equivalence of tenths and hundredths

objectives

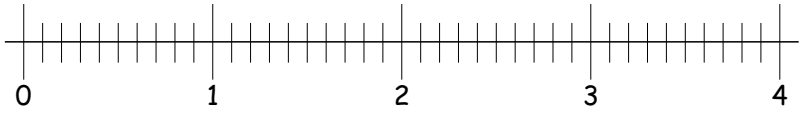
- Understand and use decimal notation and place value.
- Compare two simple fractions by using a diagram.
- Find fraction and decimal equivalents for tenths and hundredths.

starter

Vocabulary
fraction
decimal
tenth
whole

Resources
OHT N2.6a
interlocking cubes

Draw on the board a number line from 0 to 4, marked in tenths, or use **OHT N2.6a**.



Hold up a stick of ten cubes.

Q How many cubes in this stick? Count them with me: one, two, three, …, nine, ten.

Hold up one cube.

Q What fraction – what part – of the whole stick is this? (one tenth)

Write $\frac{1}{10}$ on the board. Tell the class that the fraction can also be written as a decimal number, and write 0.1 on the board.

Hold up seven cubes.

Q What part of the whole stick is this? (seven tenths)

Write $\frac{7}{10}$ on the board.

Q How else could you write this? (0.7)

Hold up two whole sticks of ten cubes, and four single cubes.

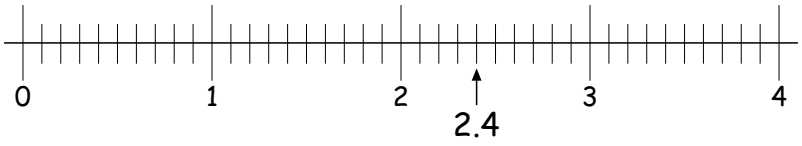
Q How many whole sticks? (two)

Q How many parts of a whole stick? (four tenths)

Write $2\frac{4}{10}$ on the board.

Q Where is two and four tenths on the line?

Point to 2, saying: 'Two whole ones'. Count on four tenths from 2: one tenth, two tenths, three tenths, four tenths. Mark it with an arrow.



Repeat by holding up whole sticks of cubes and single cubes for 1.7, 3.6, 0.9.

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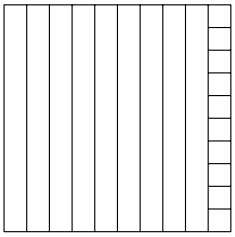
main activity

Vocabulary
hundredth
equivalent

Resources
prepared paper squares

Prepare several large paper squares, all the same size. Mark one in ten equal strips, with one strip marked in ten equal small squares. Make another copy of this square, and cut it into nine strips and ten small squares.



Hold up the square marked in strips. Tell the class that this is one whole square, which you have cut into ten equal strips. Hold up one of the prepared strips, matching it to a strip on the whole square.

Q What fraction – or part – of the whole square is this? (one tenth)

Write $\frac{1}{10}$ on the board.

Q How do you write one tenth as a decimal number? (0.1)

Write 0.1 next to $\frac{1}{10}$ on the board. Point to each in turn, saying: 'one tenth, zero point one'. Remind the class that some people might say 'nought point one', and that zero and nought have the same meaning.

Choose seven pupils to help you. Give four of them a large paper square, and three of them a paper strip.

Q How many whole squares? (four) **How many tenths?** (three)
How many tenths altogether? (forty-three)

Write $\frac{43}{10}$, $4\frac{3}{10}$ and 4.3 on the board. Point to each in turn, saying: 'forty-three tenths, four and three tenths, four point three'. Repeat with 6.2.

Hold up the strip marked in ten small squares. Tell the class that you have cut this strip into ten small squares. Hold up one of the small squares, matching it to a small square on the strip.

Q How many of these small squares are in a whole square? How did you work that out?

Establish that there are 100 small squares in the large square, because there are ten small squares in a strip, and ten strips in the whole square. Ten lots of ten make one hundred.

Point again to the small square.

Q What fraction – or part – of the whole square is this? (one hundredth)

Write $\frac{1}{100}$ on the board.

Q How do you write one hundredth as a decimal number? (0.01)

Write 0.01 next to $\frac{1}{100}$ on the board. Point to each in turn, saying: 'one hundredth, zero point zero one'.

Choose six pupils to help you: two to hold up two large squares each, one to hold up two strips, and three to hold up two small squares each.

Q How many squares can you see?

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Establish that this is four and two tenths and six hundredths. Write 4.26 on the board. Point to each digit in turn, saying 'four, the whole number; two, the number of tenths; six, the number of hundredths'.

Ask the class to think about two tenths and six hundredths. Write 0.26 on the board. Refer again to the pupil holding the two strips and say 'two tenths', and to the pupils holding the six small squares, saying 'six hundredths'.

Q How many hundredths are equivalent to or the same as two tenths and six hundredths?

Establish that there are ten hundredths in every tenth, so there are twenty hundredths in two tenths. Altogether, there are twenty-six hundredths. Write on the board: $0.26 = {}^{26}/_{100}$.

Repeat with other decimals.

other tasks

Springboard 7
Unit 5

Unit 5 section 3: Decimals

plenary

Resources
mini-whiteboards

Write on the board 8.1 and 8.01. Ask the class:

Q How would you explain to a friend what is different about these two numbers?

Q Which of the two numbers do you think is the larger? Why?

Q What number is one tenth more than 8.1? Than 8.01?

Repeat with one tenth less, one hundredth more, and one hundredth less.

Remember

- Fractions can be seen as parts of a whole or as points on a line.
- Equivalent fractions have the same value but are written in different ways.
- One whole is equivalent to ten tenths, or one hundred hundredths.
- One tenth is equivalent to ten hundredths.

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N2.7 Positioning decimals on a number line

objectives

- Understand and use decimal notation and place value.
- Compare and order decimals.

starter

Vocabulary
tens
hundreds

Resources
counting stick

Use a counting stick.

Tell the class that one end is nought or zero, and the other end is 10. Point to 2 on the stick, and ask:

Q What number is this?

Repeat with 6. Now tell the class that the far end of the stick has changed to 100. Point to 20 and repeat the question, then to 60. Confirm by counting along the stick and back in tens. Change the far end of the stick to 1000, point to 200 and to 600, and repeat the question each time. Confirm by counting along and back in hundreds.

Now tell the class that one end of the stick is 17, and the other is 27. Point to the position for 19, asking:

Q What number is this? How do you know?

Establish that the ten intervals between 17 and 27 must each represent one. Count on in ones from 17 to confirm the positions. Repeat with 23 and 33.

Repeat with ends of 247 and 347 (intervals of 10), and 3650 and 4650 (intervals of 100), each time counting along the stick to confirm positions.

main activity

Vocabulary
halfway
tenths
hundredths
position

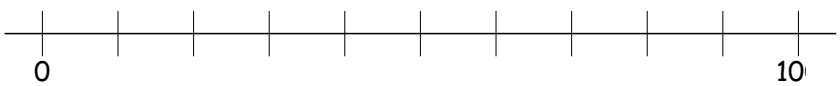
Resources
OHTs N2.7a, N2.7b, N2.7c

Explain that the class is going to identify decimal numbers 'hidden between' whole numbers on a number line. Draw this line on the board.

Point about halfway between 0 and 10.

Q What number am I pointing at? How do you know?

Draw in the markers for the whole numbers, without numbering them.



Point first to where 7 would go, and then where 8 would go. Each time ask:

Q What number goes here? Explain why.

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Write in the numbers 7 and 8, then point somewhere between them and repeat the question. Establish that it is difficult to say exactly what number you are pointing at, but that it is a number more than 7 and less than 8.

Q What number is halfway between 7 and 8? Where is it on the line?

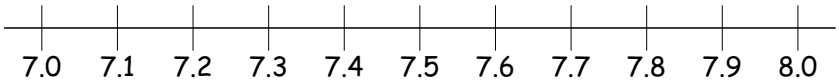
Establish the approximate position of 7.5 on the line.

Say that you are now going to zoom in on the part of the line from 7 to 8, as though you were looking at it under a microscope. Show **OHT N2.7a**, an enlarged segment of the number line from 7 to 8.

Q What numbers do the marks on this line show? (tenths from 7 to 8)

Q What number is the arrow pointing to? (7.4) **How did you work it out?**

Invite a pupil to write in the decimal number at each marker.



Explain that the markers at 7 and 8 can be written as 7.0 and 8.0, because the line is marked in intervals of one tenth, or 0.1. Count together forwards and backwards along the line, saying seven, seven and one tenth, seven and two tenths, seven and three tenths, …, then seven, seven point one, seven point two, seven point three, …

Q What number is one tenth more than 7.3? Three tenths less than 7.8?

Q What number is two tenths more than 7.9? Three tenths less than 7.1?

Write the following on the board, point to each in turn, and ask for the answer:

7.5 + 0.3	7.8 + 0.5	7.6 + 0.4
7.9 – 0.4	7.4 – 0.6	7.3 – 0.3

Say that you will zoom in again, this time between the 7 and the 7.1. Show **OHT N2.7b**, the segment of the line from 7.0 to 7.1, with ten intervals. Explain that the new line is marked in intervals of one tenth of one tenth, or one hundredth. Point to different markers.

Q What number am I pointing to?

Get pupils to call out the number at each marker as you write them in. Count on and back along the line from 7 to 7.1, in hundredths: seven, seven point nought one, seven point nought two, …, seven point nought nine, seven point one.

Q What number is one hundredth more than 7.04? Two hundredths less than 7.05?

Write on the board: 7.07 + 0.02.

Q What is the answer?

Repeat with 7.08 – 0.04.

Show **OHT N2.7c**. Say that this line goes from 1 to 2, and label each end. Point to the divisions for the tenths.

Q What are these markers? (tenths) **How do you know?**

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Confirm by counting along the line in tenths: one, one point one, one point two, one point three, …, two.

Point to the mark for 1.7 and ask:

Q What is this number? (one point seven)

Q What would it be as a fraction? (one and seven tenths)

Repeat for 1.4 and 1.9.

Point to the divisions for hundredths between 1.3 and 1.4.

Q What are these markers? (hundredths)

Confirm by counting along the line from 1.3 in hundredths: one point three, one point three one, one point three two, …, one point four.

Remind the class that each small interval is one hundredth. Point to the mark for 1.32, and ask:

Q Which 'tenths' does this number lie between? (1.3 and 1.4)

Q What is this number? (one point three two) **How did you know?**

Q What is the value of the digit 3? (three tenths) **Of the digit 2?** (two hundredths)

Stress that 1.32 is one whole and three tenths and two hundredths.

Q What would this be as a fraction? (one and thirty-two hundredths)

Repeat, choosing different pupils to come and point to 1.46 and 1.08.

Change the numbers at the end of the line to 26 and 27, and repeat. Stress that to find the number at a given position, they must look first at the whole number, then at the tenths, and then at the hundredths.

other tasks

Springboard 7
Units 5 and 13
Assess and review 2

Unit 5 section 3: Decimals

3 Number lines page 186
4 Zooming in page 186

Unit 13 section 4: Ordering fractions and decimals

Star challenge 8: Putting numbers in their place page 434

Assess and review 2

Question 5 page 292

plenary

Resources
OHT N2.7d

Show **OHT N2.7d**, and work through the questions with the class. Ask pupils to explain their reasoning as they work out the answers.

Remember

- Like whole numbers, decimals can be placed in order on a line.
- Between any two numbers on a line, there are always more numbers.

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N2.8 Ordering decimals

objectives

- Understand and use decimal notation and place value.
- Compare and order decimals.

starter

Vocabulary
most significant digit

Write on the board 5132 and 987, side by side. Point out that they are both whole numbers.

Q Which is the bigger number? How do you know?

Say that, when we compare the size of numbers, we look at the most significant or important digit first, and that this is on the left. We then compare like with like: thousands with thousands, then if necessary hundreds with hundreds, then if necessary tens with tens, and so on.

In a column, the numbers would appear as:

5132
 987

It is now easy to see that 5132 is bigger than 987, which has no thousands.

Repeat with 7256 and 7265. Explain that this time we compare 7 thousands with 7 thousands, then because they are the same we compare 2 hundreds with 2 hundreds, and because these too are the same, we compare 5 tens or fifty with 6 tens or sixty. This tells us that 7265 is the bigger number.

main activity

Vocabulary
amount
order
lies between
decimal place(s)

Resources
OHTs N2.8a, N2.8b
Resources N2.8c and N2.8d, made into decimal cards
Resource N2.8e

Explain that when numbers are written in a column (for example, as on a shop till receipt), they are always lined up so that the decimal points are one underneath the other. The reason for doing this is that it makes it easier to compare the numbers, or to add or subtract them.

Show **OHT N2.8a**, a 'till receipt' with about a dozen sums of money less than £10, some differing by less than 40p. Ask pupils in pairs to order the amounts of money from the highest price to the lowest price, writing them in a list in their exercise books. Take feedback on the three cheapest and three most expensive items.

Q How did you go about this task? What did you look for?

Stress that it was easy to compare the digits, working from the left: each figure had the same number of decimal places and all the decimal points were under each other. What if the numbers had a different number of decimal places? Write on the board 0.59 and 4, side by side, one whole number and one decimal number less than 1.

Q Which is the bigger number? How do you know?

Say that, in a column with the decimal points lined up, they would appear as:

0.59
4

Establish that 4 is bigger because it has 4 units, compared with none in 0.59.

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Write on the board the two numbers 0.6 and 0.59. Point out that they are both decimal numbers less than 1.

Q Are these decimals more or less than one half? How do you know?

Q Which is the bigger number? How do you know?

Say that, in a column with the decimal points lined up, they would appear as:

0.6
0.59

Stress that, comparing from the left, there are no units or ones in either numbers, so we compare the number of tenths with the number of tenths. This tells us that 0.6 is the bigger number. Only if the tenths are the same do we then compare the number of hundredths in each number. Repeat with 7.08 and 7.8, then 5.48 and 5.488.

Q Can a two-digit decimal number be bigger than a three-digit decimal number?

If necessary, refer back to 7.08 and 7.8.

Show **OHT N2.8b**. Invite pupils to the projector to complete the table. Each time ask the pupils to explain their reasoning.

Write a group of decimal numbers on the board.

32.6	32.06	33.2	32.12
33.01	3.32	32	
3.12	0.32	33.03	320.1

Q Which is the smallest number? How do you know?

Ask a pupil to come and write that number on the left of the board at the bottom, and tick off the number in the group.

Q Which is the next smallest number? How do you know?

Ask another pupil to write that number next to the first number, and to tick off the number in the group. Continue until all the numbers are used up.

Q When we are ordering a set of numbers with decimal places, what is a good starting point? How do we continue?

Make a set of 100 decimal cards from 0.0 to 9.9 by enlarging **Resources N2.8c and N2.8d** on to A3 paper. Put the cards in a box and shuffle them. Ask each pupil to draw a ladder with 10 boxes (or duplicate a worksheet from **Resource N2.8e**).

Tell pupils that you are going to pick out the decimal cards one by one. They must write the number in an empty box on their ladder if they can. Their aim is to get the numbers in order, with the smallest number at the bottom of the ladder. They may write only one number in each box and may not change the position of a number once they have written it in a box. If there is no suitable empty box, they must wait for the next number.

The winner is the person who fills the ladder first.

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Play one game, then discuss strategies for playing the game with the class, such as positioning decimals between 3.0 and 3.9 in the third space up on the ladder in the early stages of the game. Play a second game, concentrating on the strategies.

other tasks

Springboard 7
Units 11 and 13

Unit 11 section 3: Capacity

Star challenge 9: Who drinks the most? page 378

Unit 13 section 4: Ordering fractions and decimals

2 Ordering decimals page 433
3 Halfway between page 433

plenary

Secretly choose a decimal number, with tenths, lying between 0 and 10 (e.g. 4.6). Pupils take turns to ask a question that can only be answered with 'yes' or 'no': for example, 'Is the number more than 6?' 'Does the number lie between 8 and 9?'. The class pays a penalty point for every question they ask. Play continues until the number is guessed.

Repeat by choosing a decimal number, with tenths and hundredths, lying between 0 and 1 (e.g. 0.76).

Remember

- You can write decimal numbers in order on a number line.
- When writing decimal numbers in a column, line up the decimal points under each other. This makes it easy to compare them.
- To order numbers, identify the number or numbers with the lowest whole number, including zero. After that, tenths must be compared with tenths, then if necessary hundredths with hundredths.

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N2.9 Equivalence of fractions and decimals

objectives

- Count on and back in halves, fifths and quarters.
- Find fraction and decimal equivalents in simple cases.
- Use a calculator to convert simple fractions to decimals, and interpret the display.

starter

Vocabulary
halves
fifths
quarters
tenths

Resources
counting stick

Take a counting stick. Label one end with 0. Tell the class that you are going to ask them to count in fours.

Q What number will be at the end of the stick? Explain why.

Check their predictions by counting, pointing to the divisions as you go along: four, eight, twelve, …, thirty-six, forty.

Say that the line is now numbered in tenths. Remind them of the ten intervals and count along the stick. Stress that the endpoint of ten tenths is the same as 1. Now point at random at half a dozen points on the stick. Each time that you point ask:

Q What is this number?

Check any incorrect responses by counting along the stick. Repeat with:

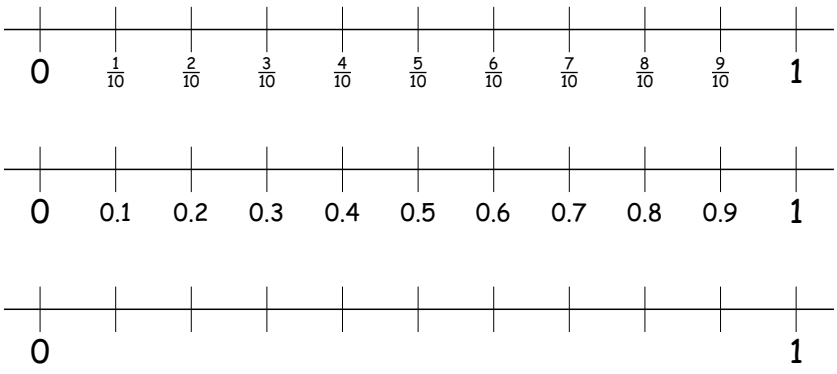
- halves (one half, one, one and a half, …, four and a half, five);
- fifths (one fifth, two fifths, …, one and four fifths, two);
- quarters (one quarter, one half, …, two and a quarter, two and a half).

main activity

Vocabulary
fraction
decimal
equivalent
numerator
denominator

Resources
OHT N2.9a
OHP calculator

Draw on the board a fraction number line from 0 to 1, marked and numbered in tenths. Immediately below, draw a decimal number line from 0 to 1, marked and numbered in intervals of 0.1. Immediately below, draw a number line from 0 to 1. Alternatively, use **OHT N2.9a**.



Point to the top line. Count together along to 1 and back to 0: one tenth, two tenths, three tenths, … Point to the middle line, and repeat: nought point one, nought point two, nought point three, …

Point to the top line. Remind the class that, like the counting stick, the line has ten intervals and is numbered in tenths. The end point is fixed at 1.

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Q Where would one half be on this line?

Establish that, for halves, there would be two intervals, each equivalent to five tenths, and that $^{5}/_{10} = {}^{1}/_{2}$.

Q Where would one fifth be on this line?

Establish that, for fifths, there would be five intervals, each equivalent to two tenths, and that $^{2}/_{10} = {}^{1}/_{5}$. Repeat for $^{2}/_{5}$, $^{3}/_{5}$ and $^{4}/_{5}$.

Say that each fraction, has a decimal equivalent. Point to $^{7}/_{10}$ and ask for the decimal equivalent. Repeat for other numbers, switching between the two lines.

Q How can you use the top two lines to mark one half on the empty line?

Mark $^{1}/_{2}$ on the third line, stressing that $^{1}/_{2} = {}^{5}/_{10} = 0.5$. Write this at the side of the board.

Q How can you use the top two lines to mark one fifth on the empty line?

Mark $^{1}/_{5}$ on the third line, writing $^{1}/_{5} = {}^{2}/_{10} = 0.2$.

Q What other equivalents for fifths can you tell me?

Establish that $^{2}/_{5} = {}^{4}/_{10} = 0.4$, $^{3}/_{5} = {}^{6}/_{10} = 0.6$, $^{4}/_{5} = {}^{8}/_{10} = 0.8$, again writing these at the side of the board. Point again to the top line.

Q Where would $^{1}/_{4}$ be on this line?

Establish that, for quarters, there would be four intervals, each equivalent to two and a half tenths, or twenty-five hundredths, and that $^{1}/_{4} = 0.25$. Write this at the side of the board. Repeat for $^{3}/_{4} = 0.75$.

Q How can a calculator be used to convert fractions to decimals?

Remind pupils that the numerator is the 'top number' and the denominator is the 'bottom number' of a fraction. The line that separates the numerator from the denominator represents division. The fraction $^{1}/_{2}$ means one whole divided into two equal parts. Demonstrate this by calculating 1 ÷ 2 on the OHP calculator and drawing attention to the decimal result.

Q How do we convert one fifth into a decimal using a calculator? What do you think the calculator display will show?

Repeat with $^{3}/_{5}$, $^{4}/_{5}$, $^{1}/_{100}$, $^{25}/_{100}$, $^{75}/_{100}$.

other tasks

Springboard 7
Units 5, 13 and 15

Unit 5 section 1: Fractions

Unit 5 section 4: Common fractions and decimals

Unit 13 section 4: Ordering fractions and decimals

Unit 15 section 2: Mental calculations – division

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plenary

Resources
Resource N2.9b
mini-whiteboards

Draw on the board an empty number line from 0 to 1. Ask pupils to copy it on their whiteboards. Call out 'one fifth', and ask pupils to estimate its position and mark it on their line. Choose one pupil to come and mark it on the line on the board. Continue with these numbers:

0.4 (nought point four), three quarters, 0.5, four fifths, 0.2,
one quarter, 0.75, two fifths, 0.25, one half, 0.8

Finish by asking a series of questions.

Q How many hundredths is … one half, one quarter, one tenth, seven tenths, three quarters, four fifths, one and a half?

Finish with a selection of mental arithmetic questions taken from National Curriculum tests, using **Resource N2.9b**.

Remember

- Fractions can be represented as points on a number line.
- Equivalent fractions are represented by the same decimal number and by the same point on the number line.
- You can convert a fraction to a decimal by dividing the numerator by the denominator. You can use a calculator to do this.

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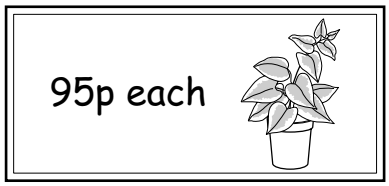
OHT N2.1a

Gwen sells kites for £12 each.
Gwen sells 26 kites.
How much does she get for the 26 kites?

Show your working.

£.....

A shop sells plants.
One plant costs 95p.
Find the cost of 35 plants.



Show your working.

Cost is £ .....

One booklet weighs 48 g.
How much do 220 booklets weigh altogether?

Show your working.
Give your answer in kg.

..... kg

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OHT N2.2a

Gwen has a box of 250 staples.
She uses 7 staples to make a kite.

How many complete kites can she make using the 250 staples?

Show your working.

..... kites

Shrubs cost £9 each. Mr Pym has £250.
He wants to buy as many shrubs as possible.

How many shrubs can Mr Pym buy?

Show your working.

..... shrubs

A teacher needs 220 booklets.
The booklets are in packs of 8.

How many packs must the teacher order?

Show your working.

..... packs

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OHT N2.2b

x	4	5	3
2			
4			
7			

x	...	...	...
...	60		
...		80	28
...	36		21

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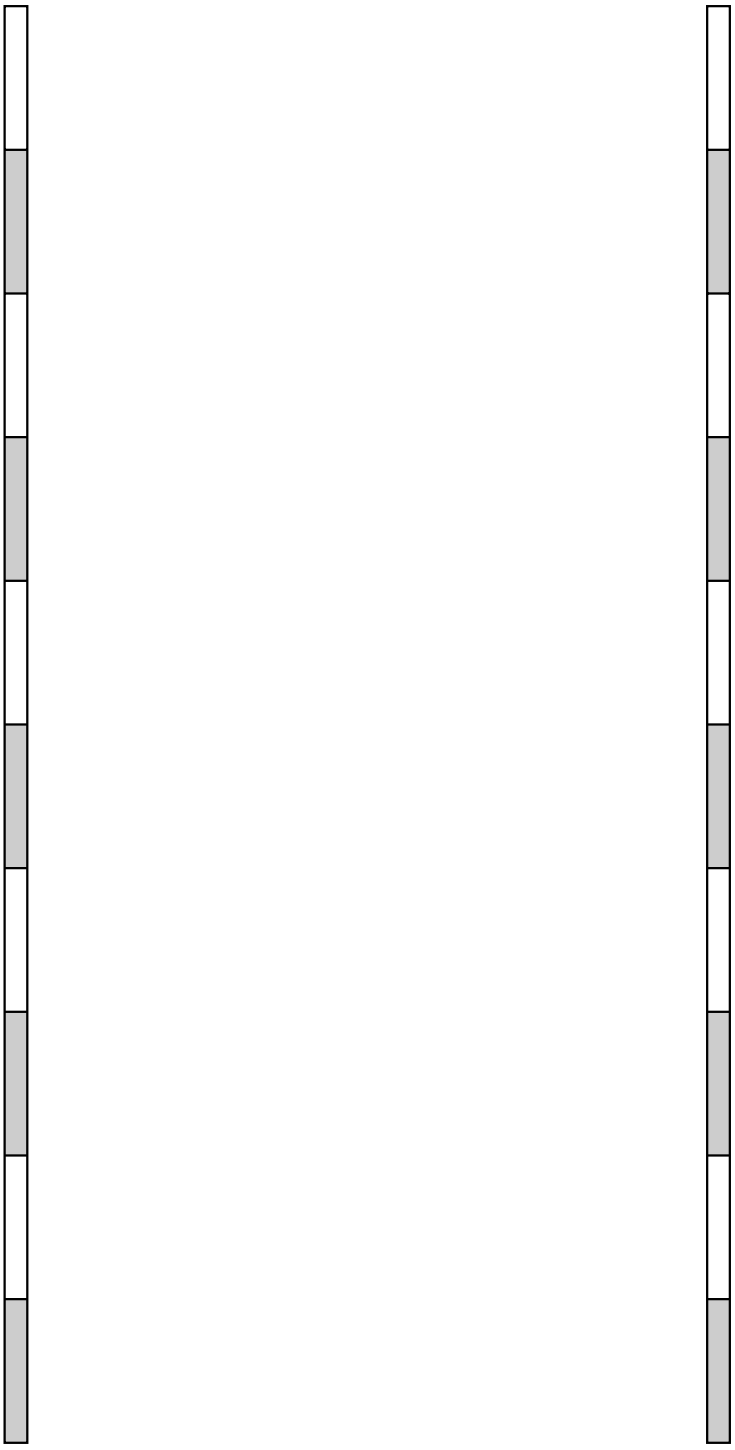
OHT N2.3a



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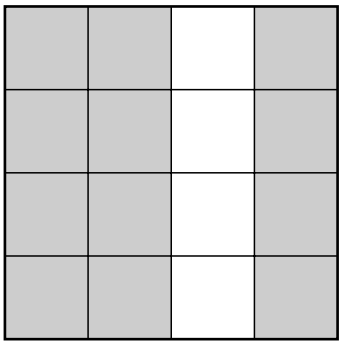
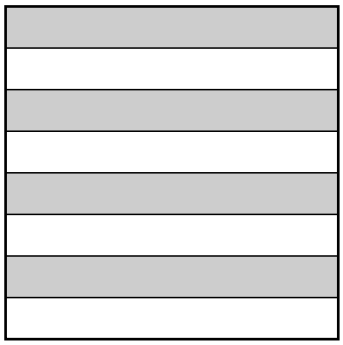
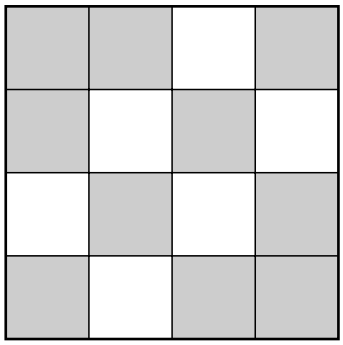
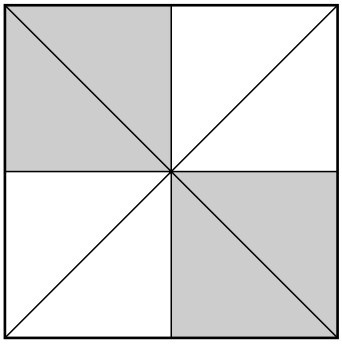
OHT N2.3b

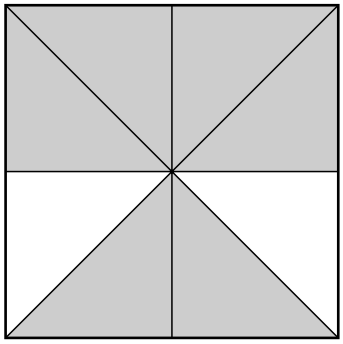
Which two shapes have three quarters shaded?
Explain how you know.











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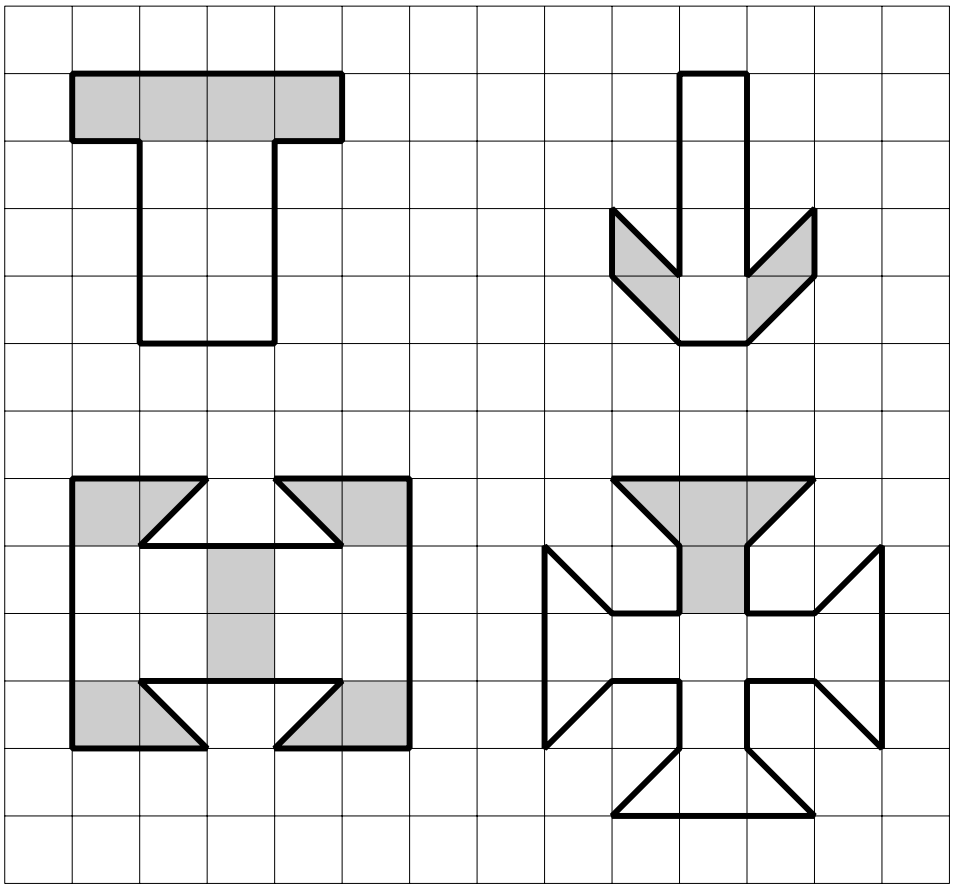
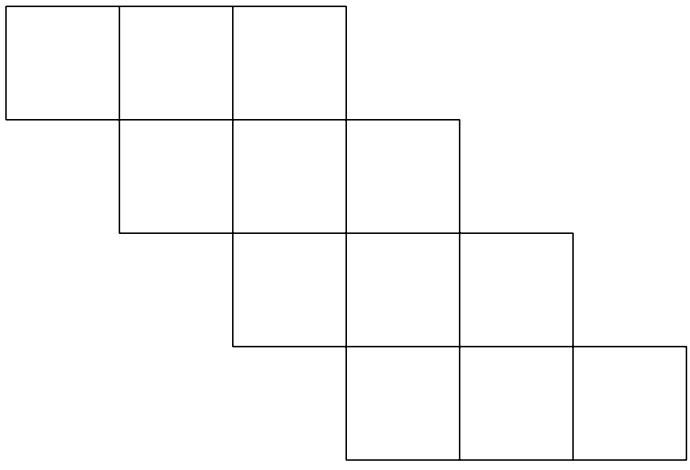
OHT N2.3c

What fraction of each shape is shaded?
Explain how you know.



Shade $\frac{2}{3}$ of the diagram below.



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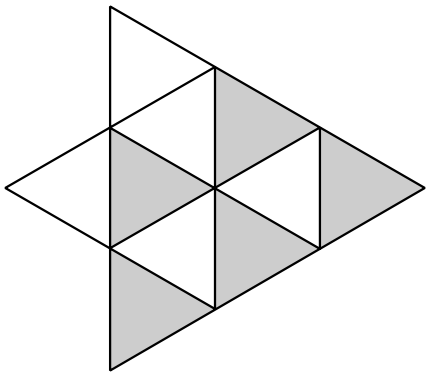
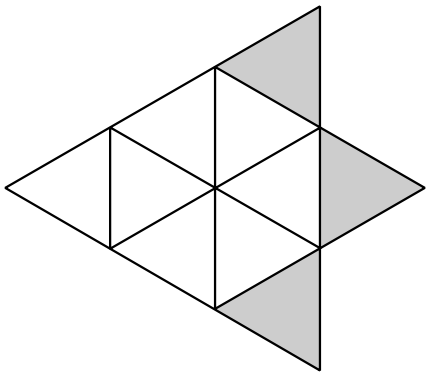
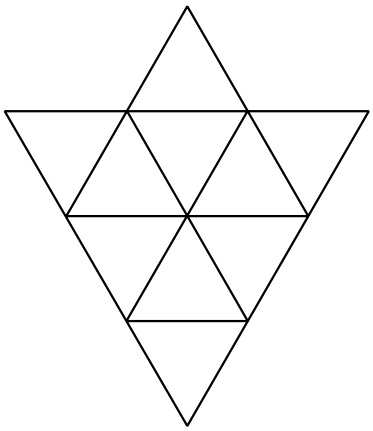
OHT N2.3d

What fraction of each shape is shaded?
Explain how you know.





Shade $\frac{3}{5}$ of the diagram below.



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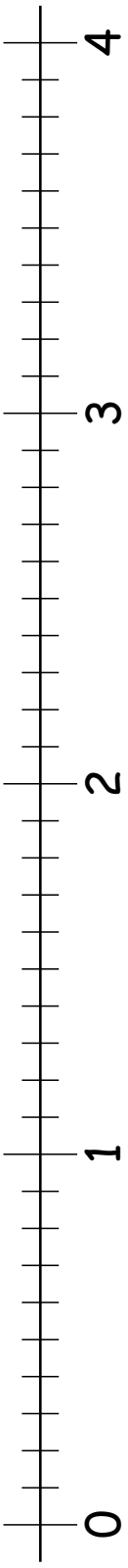
OHT N2.6a



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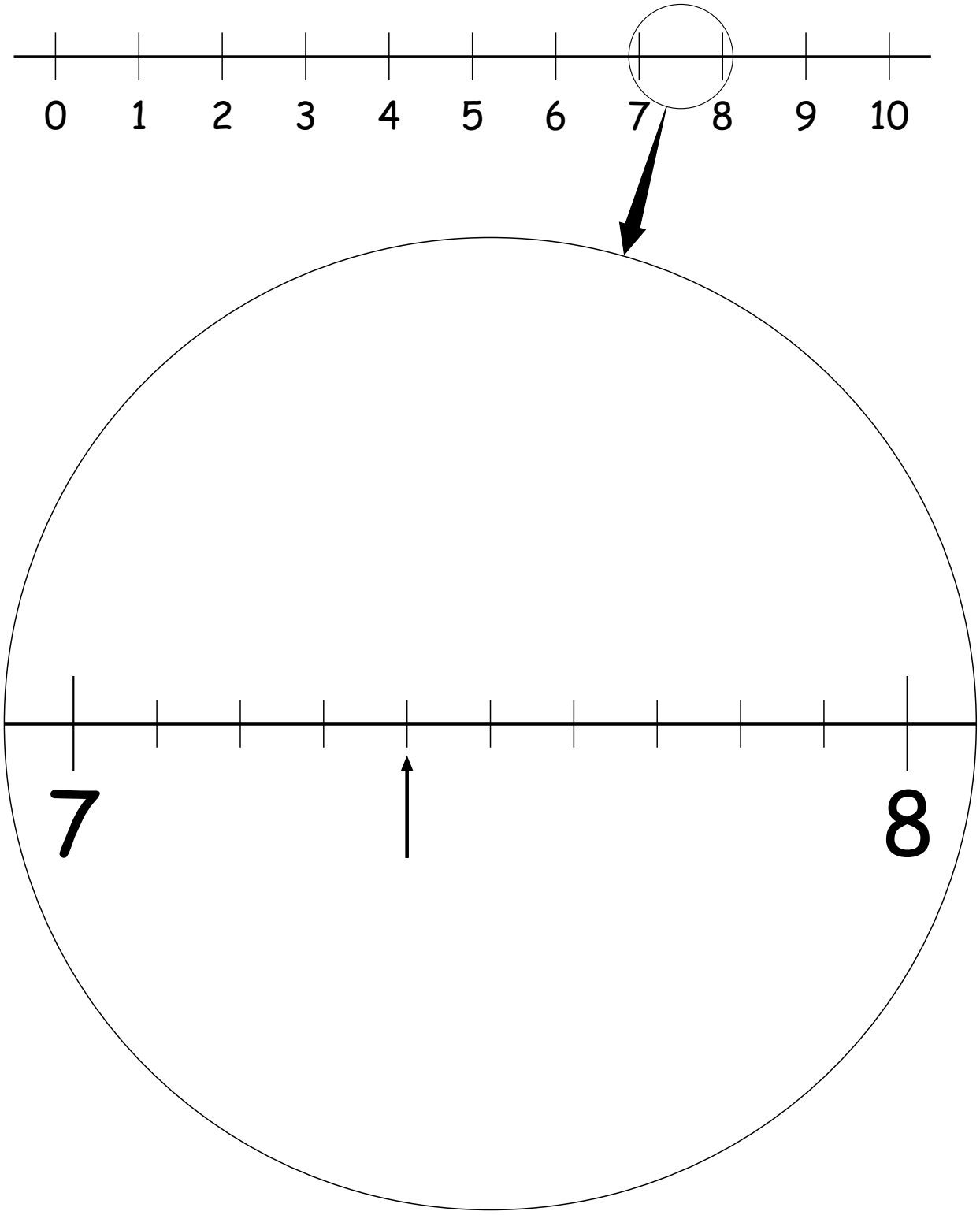
OHT N2.7a



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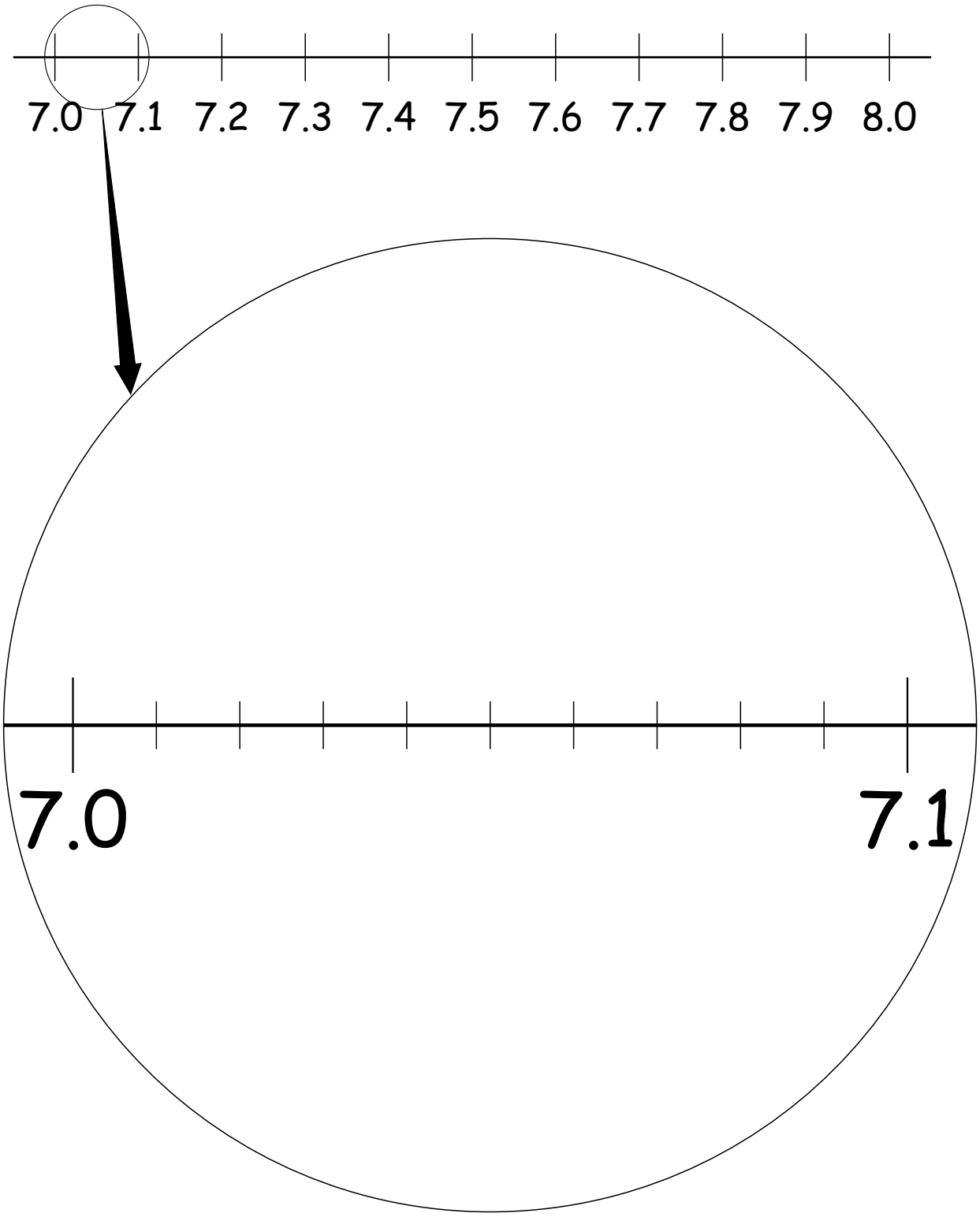
OHT N2.7b



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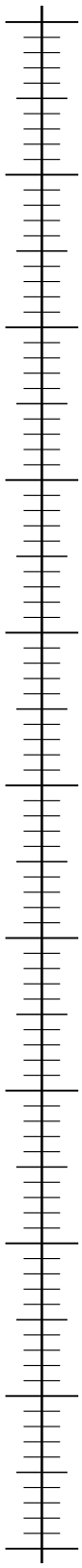
OHT N2.7c



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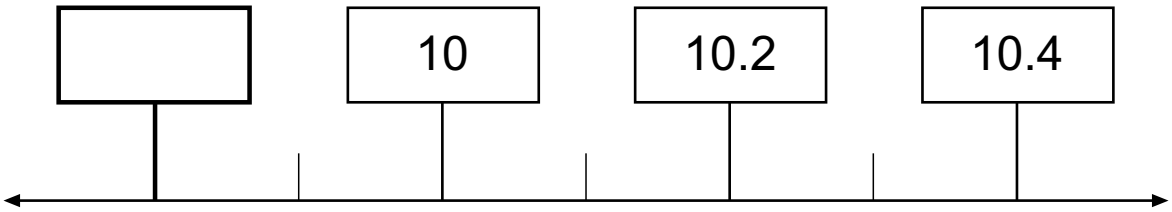
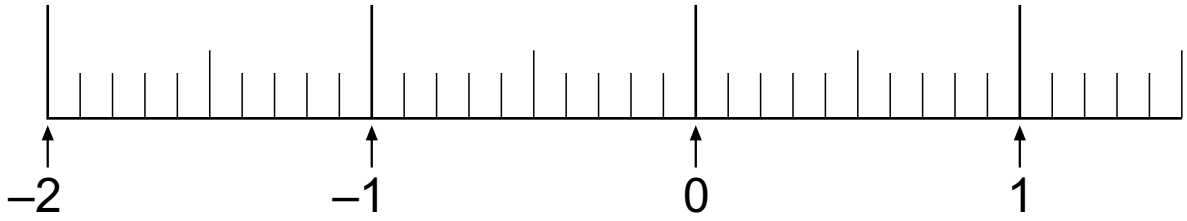
OHT N2.7d

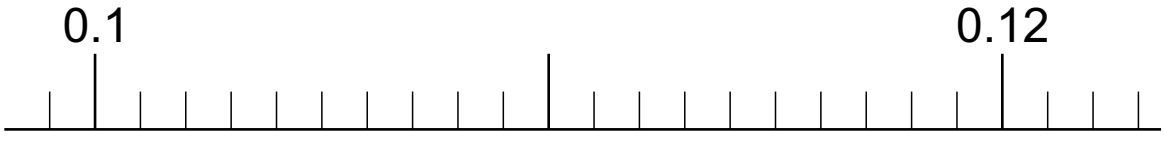
Write in the missing number on this number line.



Mark with arrows the points –1.5 and 0.45 on the number line.



Draw an arrow to show the position of 0.111 on the number line.



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BOURNE STORES	
	£
EGGS MEDIUM	1.25
TOMATOES 500g	0.78
ONIONS 500g	0.52
MILK SEMI-SKIM	0.31
CHEDDAR 250g	0.95
TEABAGS 40-PACK	0.99
CRISPBREAD	0.58
LEMONS ×2	0.86
APPLES 1kg	0.48
COFFEE	1.10
BUTTER	0.96
BANANAS ×5	0.75
BREAD MED SLICED	0.68
BAKED BEANS 200g ×3	1.05

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OHT N2.8b

Put one tick (✔) in each row to complete this table.

	greater than $\frac{1}{2}$	less than $\frac{1}{2}$
0.9		
0.06		
$\frac{11}{20}$		
0.21		

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Resource N2.8c

0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9
3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9
4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9

Enlarge on to A3 paper.

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Resource N2.8d

5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9
6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9
8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9
9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9

Enlarge on to A3 paper.

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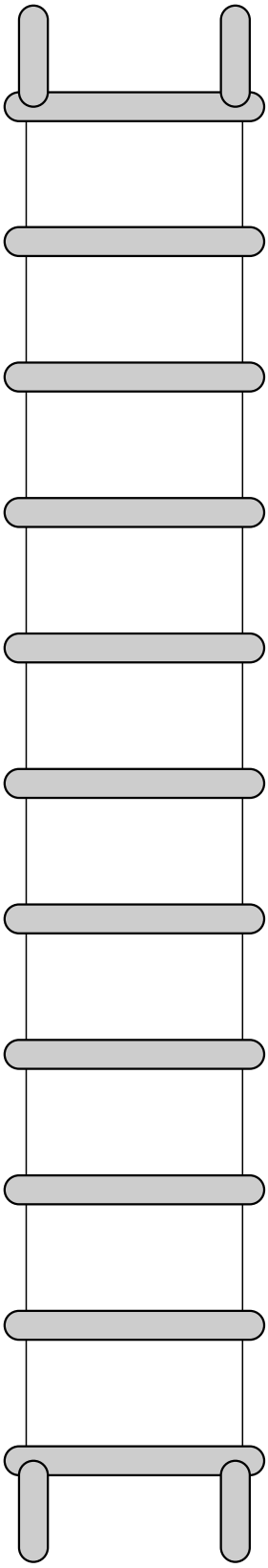
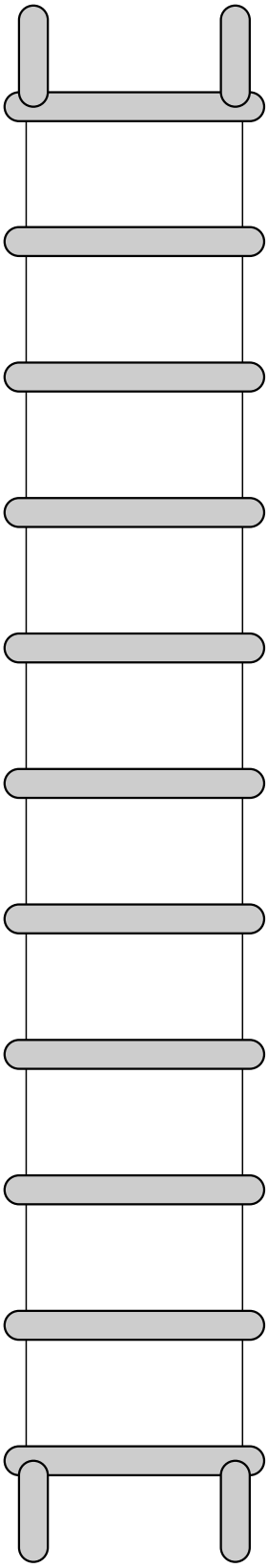
Resource N2.8e





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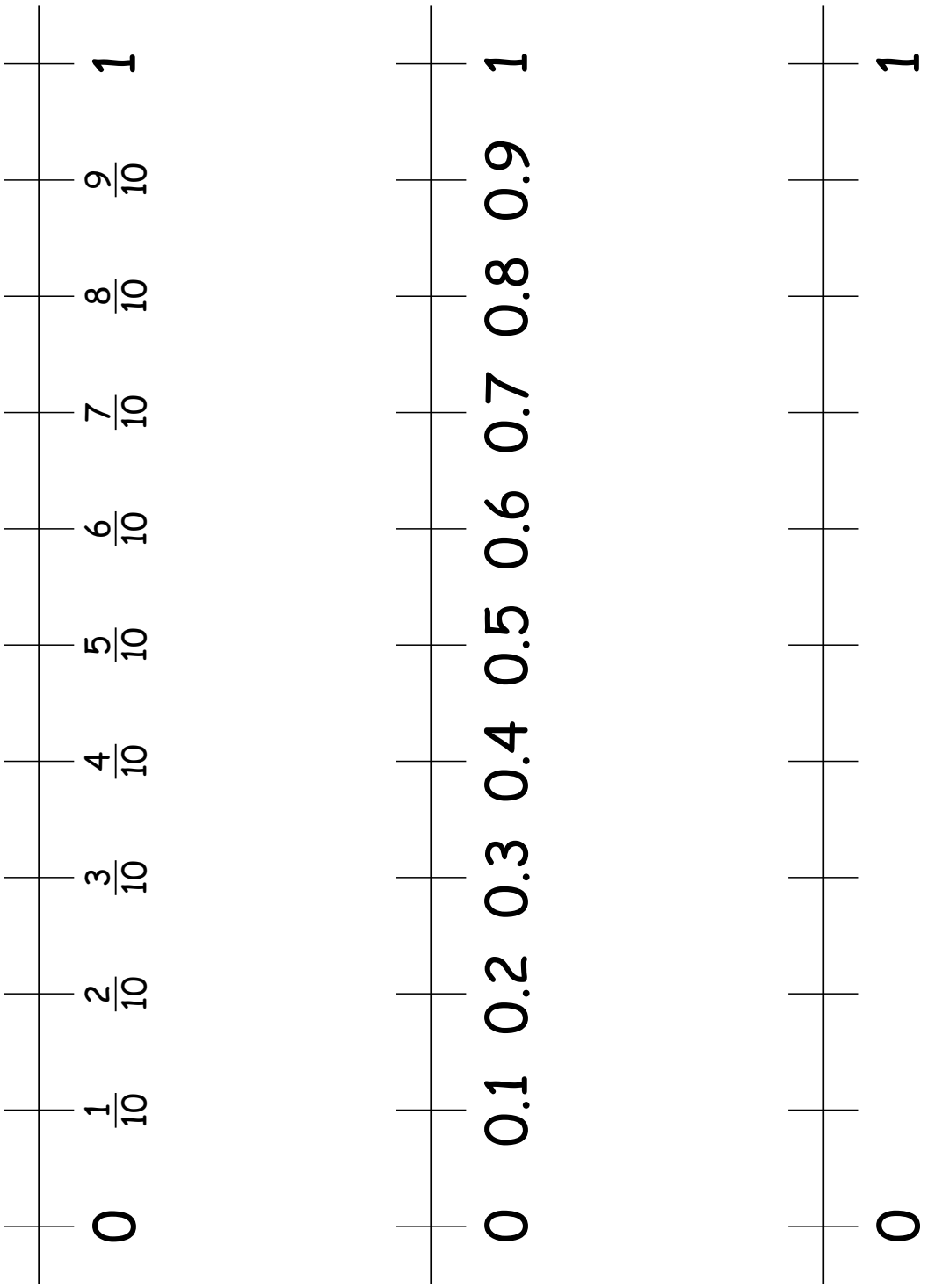
OHT N2.9a



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Resource N2.9b

1 Write the number twenty thousand and sixty-nine in figures.

2 Each side of a pentagon is twelve centimetres.
What is the perimeter of the pentagon?

3 Subtract forty from one hundred and twenty.

4 What is three quarters of two hundred?

5 How many five-pence coins make forty-five pence?

6 Divide three hundred and ninety by ten.

7 What is three quarters as a decimal?

8 What is two hundred and seventy-six centimetres to the nearest metre?

9 Multiply five by nine.

10 One third of a number is twelve. What is the number?

11 What number should you subtract from twenty to get the answer thirteen?

12 What number is nine squared?

13 In a group of sixty-three children, twenty-nine are boys.
How many are girls?

14 What is one quarter of thirty-two?

15 Subtract one hundred from six thousand and three.

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