Macmillan Mathematics

5

Teacher's Book

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MACMILLAN

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Introduction

Macmillan Mathematics is a complete mathematics scheme for pupils from Grades 1 to 6. It is written not only to develop a thorough understanding of mathematics, but also to foster interest, enthusiasm and confidence in mathematics. Its mathematical structure provides progression and development of concepts to ensure continuity and curriculum coverage.

Components

- The **Teacher's Book** gives clear guidance on planning, practical activities and the use of the pupil's material for each unit of work.
- The **Pupil's Book** provides a clear explanation of the key steps needed to learn specific skills and concepts, as well as practice, reinforcement and enrichment activities to consolidate these skills and concepts.
- The **Pupil's CD-ROM** provides further reinforcement and assessment of the skills and concepts developed within each unit, with the provision of interactive exercises.

Planning and organisation

For each grade, the curriculum has been organised into six blocks of work that are developed over the year. Each block is split into four teaching units. A teaching unit consists of a week of lessons, and covers the set of objectives that guide planning, teaching and pupils' learning. The fourth unit in each block is an 'assess and review' unit. This provides an opportunity for pupils to use and apply the skills and concepts learnt in the previous three units, and also allows teachers to assess and monitor pupils' progress. Those pupils who are not keeping up with their peers can then receive the additional attention and support they need.

Teaching sequence

Term 1

September	October	November	December
Block A	Block B	Block C	

Term 2

January	February	March	April	May
Block D	Block E	Block F		

Successful teaching and learning with Macmillan Mathematics

Macmillan Mathematics is intended to be used in the context of quality-first teaching, with activities to support the teacher in their efforts to develop pupils' learning, confidence and love of mathematics. The authors give these principles to outline their thoughts on teaching and learning mathematics:

1 Plan and provide a balanced, practical experience that incorporates the acquisition, consolidation and application of knowledge and skills, with opportunities to use and extend thinking and reasoning.
2 Model ways to explore mathematics. Look for patterns, rules and properties. Direct pupils' learning by providing examples that enable them to identify appropriate methods and understand rules and ideas.
3 Give pupils the opportunity to consolidate their learning, with frequent and regular periods of practice that are short, sharp and focused.
4 Ensure that pupils recognise how their learning builds on previous learning and help them to see connections. Ensure that they feel appropriately supported and challenged by the work they are given.
5 Engage with pupils' thinking. Give them sufficient time for discussion and time to think about their ideas and methods by prompting and by asking probing questions.
6 Demonstrate and promote the correct use of mathematical vocabulary and the interpretation and use of symbols, images, diagrams and models as tools to support pupils' mathematical thinking and communication.
7 Share the excitement of mathematics, capturing pupils' imagination by teaching creatively and with enthusiasm for the subject.

Structure of Teacher's Book

Objectives: The objectives from the syllabus covered by a particular unit.

Vocabulary: The key words to use and develop with pupils. List these on the wall or board for the pupils to read.

Lessons: The focus for each lesson. Share this with your pupils at the start of each lesson.

Oral and mental starters: Suggested starter activities for the first 5 minutes of each lesson (see below).

Resources: Practical resource suggestions to help support the teaching and learning of this unit.

Prior learning: The step before this unit of work. Use this as a basis for some questions at the start of the unit to assess the pupils' prior knowledge and understanding.

Background notes: Linking theory with practice, this briefly outlines some common difficulties and misconceptions for this unit of work and gives key teaching points.

Supporting the topic: Lists suggestions for using and applying the mathematics in real-life situations.

End of unit evaluation: Learning outcomes for this unit, with key areas of assessment linked to the objectives.

This unit overview is followed by lesson notes containing practical activities and references to the pupil's book.

Oral and mental starters

These are suggestions for whole class mental mathematics activities for the first 5 or 10 minutes of each lesson. They are interactive and lively oral activities, with questions, games and practical activities that actively involve the pupils. They enable pupils to become confident and agile with mental calculation and number, as well as consolidating work done on shape, measures and handling data. The starters have a number of purposes.

- They can prepare the pupils for the unit of work ahead, rehearsing and sharpening skills. For example, for a unit on fractions of amounts you may plan mental starters on division facts to support their understanding.
- They can be used as a method of 'keeping sharp' the skills and concepts introduced in previous units. For example, an oral starter on names and properties of 2-D shapes, 4 weeks after teaching shape, will remind pupils of that teaching and consolidate their learning.
- They reinforce the importance of the language of mathematics, with regular re-visiting of vocabulary.
- They allow you to quickly assess pupils' knowledge and understanding of an area you intend to teach in the main part of the lesson. For example, before teaching subtraction of 2-digit numbers, you could ask oral questions on adding 10s to check pupils' understanding.

Basic resources such as number cards, counters and number lines are important. Once you have used some of the activities, refine and develop them and plan your own starters to support your teaching.

Hands up (reading numbers 0.001 to 99 999 999): Write a set of eight numbers (numerals or words) on the board. Ask a pupil to point to a given number. Ask the class to raise their hands if they agree. Repeat.

Start here (counting 0.001 to 99 999 99): Ask the class to count on from and back to different starting numbers, e.g. start at 460 387 and count to 460 405. Repeat with other numbers.

Steps (multiples and sequences): Ask the class to count on from a given starting number in multiples of an appropriate number and then back (e.g. in 6s, 7s, 8s, 9s, 25s, 50s, 60s, 100s, 100 000s, 0.1s, 0.05s etc.).

What's the order? (ordering numbers 0.001 to 99 999 999): Write a random set of numbers on the board. Ask the class to put them in order, starting with the smallest. Ask, 'Which comes first? Second?' Write the order and ask, 'Is this correct?' Alter if necessary.

Arrows away (place value to 99 999 999): Use a set of place value 'arrow cards' (see Pupil's Book 4A page 4). Show 63 479 using the arrow cards. 'What is this number? What does the 6 mean?' (sixty thousand). Reveal the 60 000 card. Replace the card. 'What does the 7 mean?' (seventy or 7 tens) Reveal 70. Repeat with the other digits.

What's the rule? (number sequences): Write the beginning of a sequence on the board, e.g. 3, 8, 13, 18 …; 8 436 750, 8 436 720, 8 436 690, 8 436 660 …; 0.05, 0.1, 0.15, 0.2 … Ask, 'What is the rule?' (e.g. the numbers go up in steps of 5, go down in steps of 30, go up in steps of 0.05) Say the sequence together, and continue until you say, 'Stop.'

Double it (doubling numbers): Give 2-, 3- and 4-digit numbers for the class to double. Give a number for a named pupil to double. Repeat. Include decimals with three places or fewer.

Just a fraction (fractions of whole numbers): Give multiples of appropriate numbers for pupils to find a given fraction, e.g. multiples of 10 for pupils to find $\frac{7}{10}$, multiples of 4 for them to find $\frac{3}{4}$, multiples of 3 for them to find $\frac{2}{3}$ etc. They could respond as a whole class when you give a signal, or individually, or a mixture of both.

Equal parts (equivalent fractions): Write a fraction or mixed number on the board, e.g. $\frac{2}{3}$. Ask pupils to suggest equivalent fractions. Include decimal fraction equivalents to common fractions.

Ordering parts (ordering fractions): Write a proper fraction, an improper fraction and a mixed number. Ask pupils to suggest which is the smallest, the next smallest etc. until they are all in order.

Decimal parts (ordering decimals): As 'ordering parts' above, but use decimals.

Language (understanding mathematical language): Use the mathematical language being developed. For example, 'What is the product of 7 and 5? Is 3 a factor of 32? What is 45% as a fraction in its lowest terms?'

Flash facts (addition, subtraction, multiplication or division facts): Ask questions (e.g. 8 + 7, 13 – 6, 7 × 8, 42 ÷ 6) for pupils to answer together as a class, or by each holding up a number card when you give a clap.

Pairs for sums (addition): Say 135. Pupils hold up two number cards that total 135. Repeat with other numbers.

Product pairs (multiplication): As 'Pairs for sums', but pupils show two numbers with that product.

My way (adding and subtracting 2-digit numbers mentally): Write an addition or subtraction on the board. Ask for the answer, and how pupils worked it out. Record the method, e.g. 'For 46 + 35, I added 46 and 30, which is 76.' (Record 46 + 30 = 76.) 'Then I added 5 more to 81.' (Record 76 + 5 = 81.)

Name it (2-D and 3-D shapes): Describe shapes by using mathematical properties, for pupils to name: 'This shape has four triangular faces. This 2-D shape has eight sides all the same length. All the angles are equal.'

Tell me a story (word problems): Write a calculation on the board, e.g. 8 × 7 = 56, 54 ÷ 3 = 18, $4\frac{1}{2} + 3\frac{2}{3}$, 5.25 – 3.07. Ask pupils to make up a 'number story' for each calculation.

What's the question? (using and developing knowledge of relationships in number): Provide an appropriate number, e.g. 48. 'The answer is 48. What's the question?' Pupils give number statements which have 48 as the answer, e.g. 16 × 3, 35 + 13, 96 ÷ 2, 10 000 – 9952, 24% of 200 etc. Record each on the board. Repeat.

What's my number? Ask, 'I'm thinking of a number. When I add 26 to it, the answer is 61. What is it?'

Pupil's Book 5A

Block A Understanding numbers

Maths Topic	National Standards from Government Guidelines	
Unit	*Curriculum area*	*End of year objectives / success criteria*
1 Decimal numbers	Understanding numbers, ways of representing them and the relation between them	● Recognise decimal fractions. ● Read, say and write decimal numbers. ● Round decimals to the nearest whole and tenth. ● Compare and order whole numbers and decimals.
2 Number patterns and algebra	Use symbols and shapes in representing and analysing mathematical structures and situations Understand types, relations and functions Use mathematical models in representing relations and analysing mathematical changes in various situations	● Count in order, in thousands and millions. ● Determine negative numbers in real-life situations. ● Determine the mathematical relations and patterns using tables, diagrams and calculators. ● Predict using numerical and non-numerical patterns. ● Identify the rules of patterns and explain them. ● Relate equations to rules (e.g. $y = 3x + 5$). ● Find the missing number in open sentences. ● Use letters to represent boxes in open sentences. ● Find the missing numbers that the letters represent.
3 Multiples and factors	Understanding numbers, ways of representing them and the relation between them	● State the multiples of numbers up to 144. ● State the pairs of factors of numbers. ● State the square of numbers up to 10 × 10. ● Use the criteria for divisibility. ● Identify prime numbers, HCF and LCM.
4 Assess and review	Revision and assessment of Units 1, 2 and 3: problems, formative and summative assessment. Activities to monitor, assess, evaluate and consolidate children's knowledge and understanding.	

During this block of work, pupils will experience:

1 Reading, saying, writing, comparing, ordering and rounding decimals up to three decimal places
2 Converting fractions to decimals and vice versa; multiplying and dividing decimals by 10 and 100
3 Identifying rules of sequences of whole numbers (with up to eight digits) and of decimals (four digits)
4 Ordering negative numbers, calculating differences between them and using them in sequences
5 Determining the function (relationship) from a table of results and vice versa
6 Finding the formula (rule) for a sequence of numbers and using n to represent any number, e.g. 3n + 1
7 Solving equations by finding the number which a letter or symbol represents
8 Writing missing number statements to represent real-life situations
9 Using the rules of divisibility to find multiples; finding common multiples and lowest common multiples
10 Finding factors, common factors and highest common factors
11 Identifying prime numbers and square numbers and using them in investigative problem-solving situations

Unit 1 **Decimal numbers**

Term 1 Block A
Understanding numbers
Unit 1 Decimal numbers
Unit 2 Number patterns and algebra
Unit 3 Multiples and factors
Unit 4 Assess and review

Objectives
At the end of the unit, students should be able to …
- Recognise decimal fractions and decimal numbers up to three decimal places.
- Read, say and write decimal numbers in symbols and words.
- Round decimals to the nearest whole number and tenth.
- Compare whole numbers and decimals and order them.

Vocabulary
decimal number, decimal fraction, decimal point, tenths, hundredths, thousandths, digit, place value, rounding

Lessons
1 Tenths and hundredths
2 Thousandths
3 Multiplying and dividing by 10 and 100
4 Comparing and ordering decimals
5 Rounding decimals

Oral and mental starters
Start here
Steps
What's the order?
Hands up
Equal parts

Resources
Squared paper
Pupil's Book pages 4–13

Prior learning
Reading, writing, saying, comparing and ordering decimals with one or two decimal places. Understanding place value in decimal numbers and the equivalence between common fractions and decimals with one or two decimal places. Converting between decimals, fractions and mixed numbers.

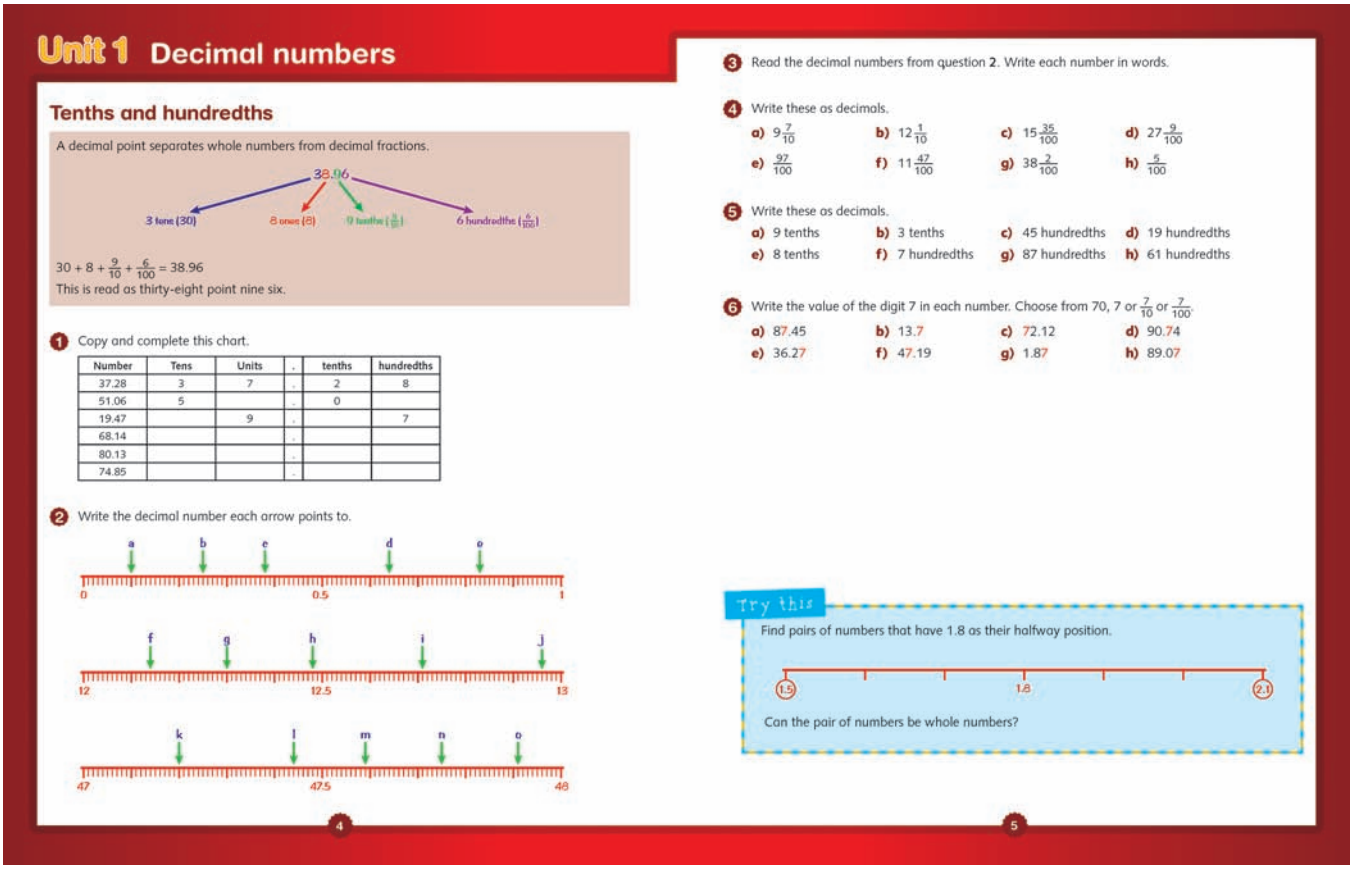
Background notes
Knowledge and understanding of decimals is revised and developed in this unit to include the third decimal place (thousandths). It is important that pupils read and say decimal numbers correctly, e.g. twenty-four point three two six, *not* twenty-four point three hundred and twenty six!

End of unit evaluation
Check that pupils are able to:
1 Read, say, write, compare, order and round decimals with no more than 3 decimal places.
2 Identify the place value of digits in decimal numbers.
3 Convert fractions (tenths, hundredths and thousandths) to decimals and vice versa.
4 Multiply and divide decimals by 10 and 100.

Supporting the topic
Discuss situations in which decimals are used in everyday life, e.g. money, measurements, statistics etc.

Lesson 1 **Tenths and hundredths**

Pupil's Book pages 4 and 5 **Oral and mental starter: Start here**



Unit 1 Decimal numbers

Tenths and hundredths

A decimal point separates whole numbers from decimal fractions.

38.96

3 tens (30) | 8 ones (8) | 9 tenths ($\frac{9}{10}$) | 6 hundredths ($\frac{6}{100}$)

$30 + 8 + \frac{9}{10} + \frac{6}{100} = 38.96$

This is read as thirty-eight point nine six.

1 Copy and complete this chart.

Number	Tens	Units	.	tenths	hundredths
37.28	3	7	.	2	8
51.06	5		.	0	
19.47		9	.		7
68.14			.		
80.13			.		
74.85			.		

2 Write the decimal number each arrow points to.

a b c d e

0 0.5 1

f g h i j

12 12.5 13

k l m n o

47 47.5 48

4

3 Read the decimal numbers from question 2. Write each number in words.

4 Write these as decimals.

a) $9\frac{7}{10}$ b) $12\frac{1}{10}$ c) $15\frac{35}{100}$ d) $27\frac{9}{100}$

e) $\frac{97}{100}$ f) $11\frac{47}{100}$ g) $38\frac{2}{100}$ h) $\frac{5}{100}$

5 Write these as decimals.

a) 9 tenths b) 3 tenths c) 45 hundredths d) 19 hundredths

e) 8 tenths f) 7 hundredths g) 87 hundredths h) 61 hundredths

6 Write the value of the digit 7 in each number. Choose from 70, 7 or $\frac{7}{10}$ or $\frac{7}{100}$.

a) 87.45 b) 13.7 c) 72.12 d) 90.74

e) 36.27 f) 47.19 g) 1.87 h) 89.07

Try this

Find pairs of numbers that have 1.8 as their halfway position.

1.5 1.8 2.1

Can the pair of numbers be whole numbers?

5

Activities

- Look at page 4 and go through the introduction with the class. Write further decimal numbers on the board and ask the class to read them aloud together on your signal, e.g. 36.4, 28.35, 59.59, 45.05, 0.87, 63.1, 70.76.
- Take each of the numbers above in turn and ask pupils to give the place value of each digit as you point to them in random order.
- Ask pupils to give the mixed number or common fraction that is equivalent to each decimal number on the board.

Answers

1 Check chart.

2 a) 0.1 b) 0.25 c) 0.38 d) 0.64
e) 0.83 f) 12.14 g) 12.3 h) 12.48
i) 12.71 j) 12.96 k) 47.2 l) 47.44
m) 47. 59 n) 47.75 o) 47.91

3 a) zero point one b) zero point two five
c) zero point three eight d) zero point six four
e) zero point eight three f) twelve point one four
g) twelve point three h) twelve point four eight
i) twelve point seven one j) twelve point nine six
k) forty-seven point two l) forty-seven point four four
m) forty-seven point five nine
n) forty-seven point seven five
o) forty-seven point nine one

4 a) 9.7 b) 12.1 c) 15.35 d) 27.09
e) 0.97 f) 11.47 g) 38.02 h) 0.05

5 a) 0.9 b) 0.3 c) 0.45 d) 0.19
e) 0.8 f) 0.07 g) 0.87 h) 0.61

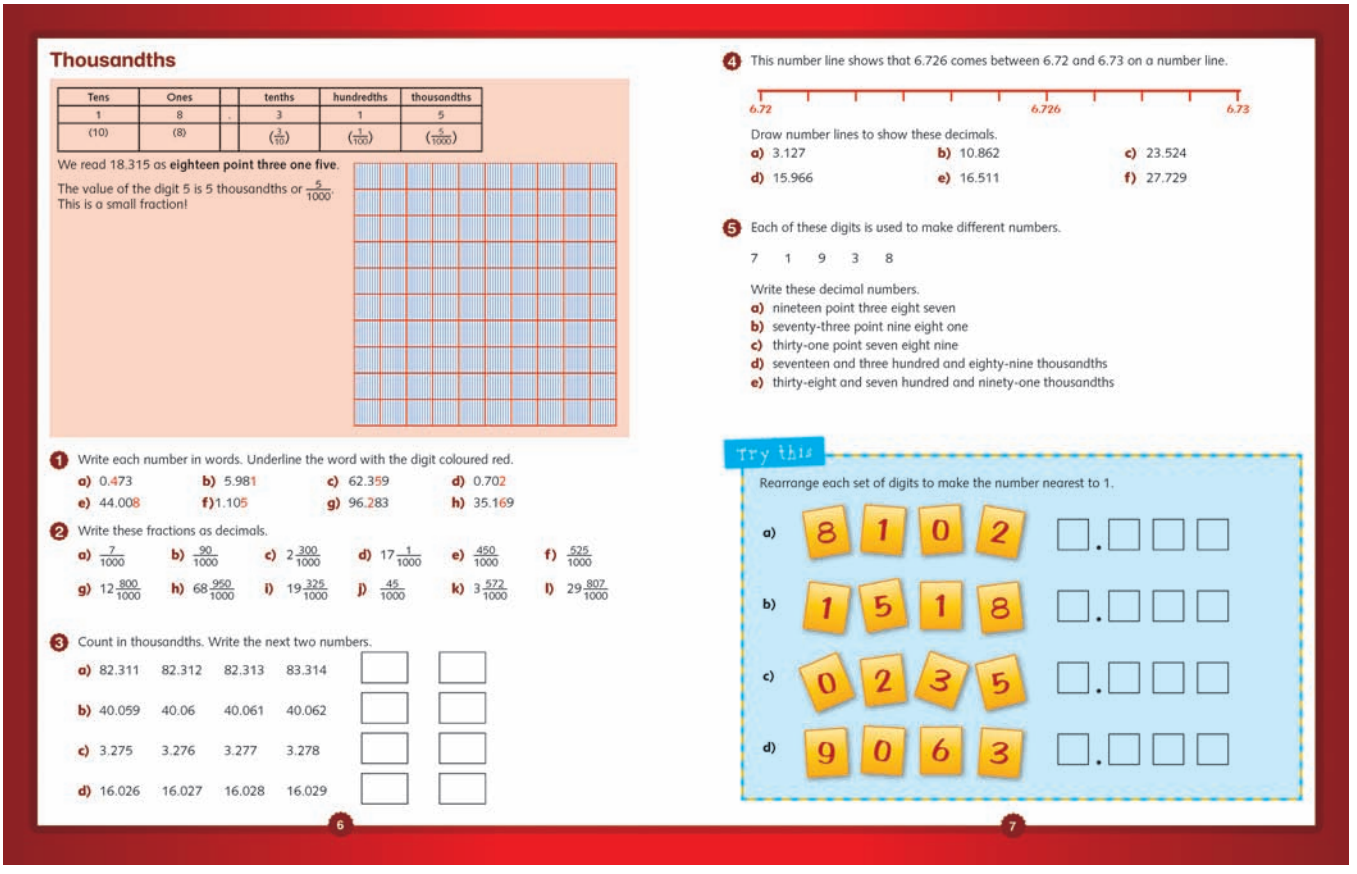
6 a) 7 b) $\frac{7}{10}$ c) 70 d) $\frac{7}{10}$
e) $\frac{7}{100}$ f) 7 g) $\frac{7}{100}$ h) $\frac{7}{100}$

Try this

Check that 1.8 is halfway between the two numbers.

Lesson 2 **Thousandths**

Pupil's Book pages 6 and 7 **Oral and mental starter: Steps (e.g. steps of 0.2)**



Thousandths

Tens	Ones		tenths	hundredths	thousandths
1	8	.	3	1	5
(10)	(8)		$(\frac{3}{10})$	$(\frac{1}{100})$	$(\frac{5}{1000})$

We read 18.315 as **eighteen point three one five.**

The value of the digit 5 is 5 thousandths or $\frac{5}{1000}$.
This is a small fraction!

1 Write each number in words. Underline the word with the digit coloured red.

a) 0.473 b) 5.981 c) 62.359 d) 0.702
e) 44.008 f) 1.105 g) 96.283 h) 35.169

2 Write these fractions as decimals.

a) $\frac{7}{1000}$ b) $\frac{90}{1000}$ c) $2\frac{300}{1000}$ d) $17\frac{1}{1000}$ e) $\frac{450}{1000}$ f) $\frac{525}{1000}$
g) $12\frac{800}{1000}$ h) $68\frac{950}{1000}$ i) $19\frac{325}{1000}$ j) $\frac{45}{1000}$ k) $3\frac{572}{1000}$ l) $29\frac{807}{1000}$

3 Count in thousandths. Write the next two numbers.

a) 82.311 82.312 82.313 83.314 ☐ ☐
b) 40.059 40.06 40.061 40.062 ☐ ☐
c) 3.275 3.276 3.277 3.278 ☐ ☐
d) 16.026 16.027 16.028 16.029 ☐ ☐

6

4 This number line shows that 6.726 comes between 6.72 and 6.73 on a number line.

6.72 6.726 6.73

Draw number lines to show these decimals.

a) 3.127 b) 10.862 c) 23.524
d) 15.966 e) 16.511 f) 27.729

5 Each of these digits is used to make different numbers.

7 1 9 3 8

Write these decimal numbers.

a) nineteen point three eight seven
b) seventy-three point nine eight one
c) thirty-one point seven eight nine
d) seventeen and three hundred and eighty-nine thousandths
e) thirty-eight and seven hundred and ninety-one thousandths

Try this

Rearrange each set of digits to make the number nearest to 1.

a) 8 1 0 2 ☐.☐☐☐
b) 1 5 1 8 ☐.☐☐☐
c) 0 2 3 5 ☐.☐☐☐
d) 9 0 6 3 ☐.☐☐☐

7

Activities

- Look at page 6 and go through the introduction with the class. Stress that thousandths are very small fractions and give an example such as the size of 1 mm compared with 1 m.
- Write further decimal numbers on the board and ask the class to read them aloud together on your signal, e.g. 3.428, 25.605, 0.059, 43.005, 0.872, 63.12, 70.444.
- Take each of the numbers above in turn and ask pupils to give the place value of each digit as you point to them in random order.
- Ask pupils to give the mixed number or common fraction that is equivalent to each decimal number on the board.

Answers

1 a) zero point four seven three b) five point nine eight one
c) sixty-two point three five nine d) zero point seven zero two
e) forty-four point zero zero eight f) one point one zero five
g) ninety-six point two eight three h) thirty-five point one six nine

2 a) 0.007 b) 0.09 c) 2.3 d) 17.001
e) 0.45 f) 0.525 g) 12.8 h) 68.95
i) 19.325 j) 0.045 k) 3.572 l) 29.807

3 a) 82.315, 82.316 b) 40.063, 40.064
c) 3.279, 3.28 d) 16.03, 16.031

4 Check that decimals are shown correctly on number lines.

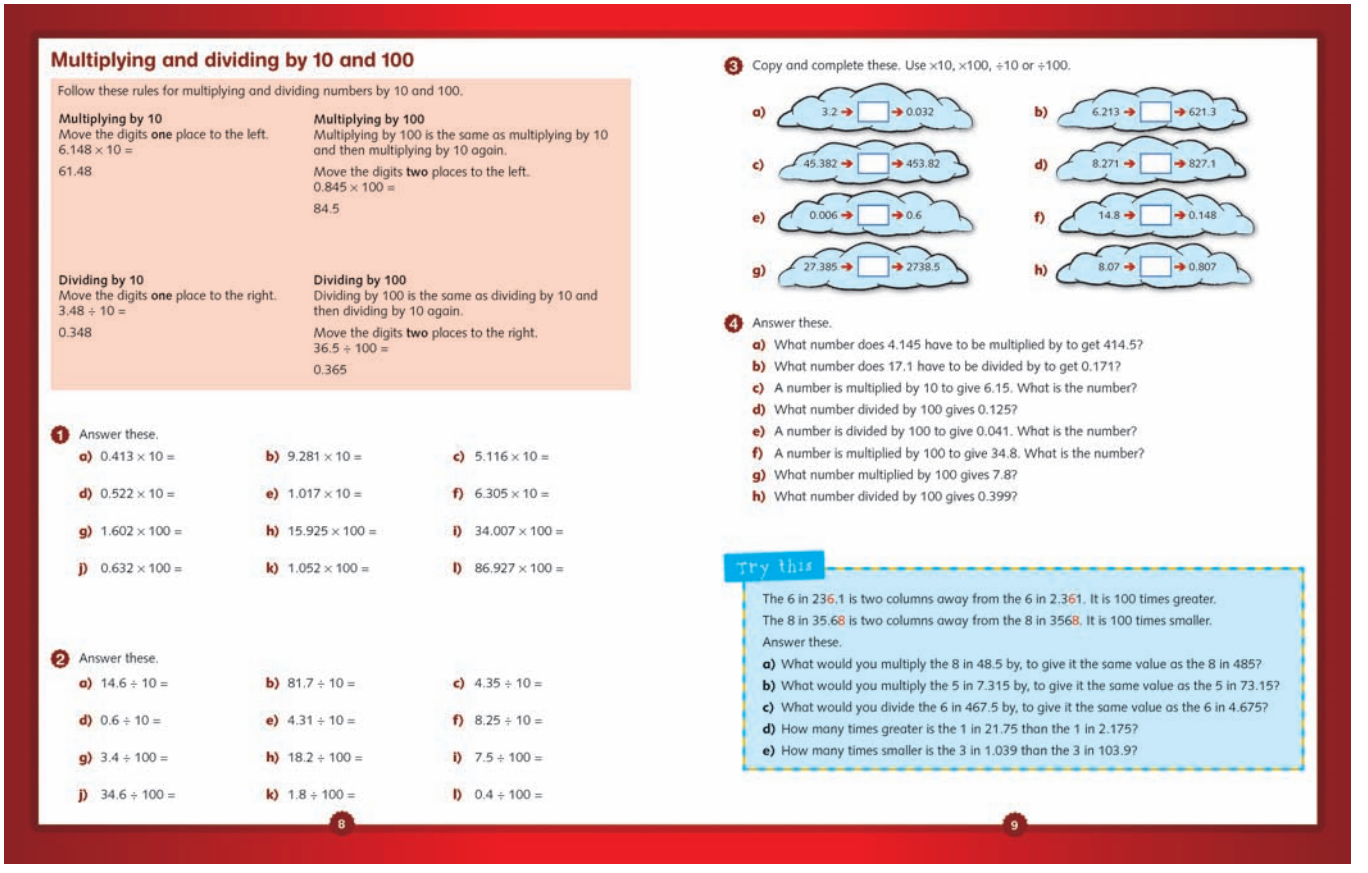
5 a) 19.387 b) 73.981 c) 31.789
d) 17.389 e) 38.791

Try this

a) 1.028
b) 1.158
c) 0.532
d) 0.963

Lesson 3 **Multiplying and dividing by 10 and 100**

Pupil's Book pages 8 and 9 **Oral and mental starter: What's the order?**



Multiplying and dividing by 10 and 100

Follow these rules for multiplying and dividing numbers by 10 and 100.

Multiplying by 10
Move the digits **one** place to the left.
6.148 × 10 =
61.48

Multiplying by 100
Multiplying by 100 is the same as multiplying by 10 and then multiplying by 10 again.
Move the digits **two** places to the left.
0.845 × 100 =
84.5

Dividing by 10
Move the digits **one** place to the right.
3.48 ÷ 10 =
0.348

Dividing by 100
Dividing by 100 is the same as dividing by 10 and then dividing by 10 again.
Move the digits **two** places to the right.
36.5 ÷ 100 =
0.365

1 Answer these.
a) 0.413 × 10 = b) 9.281 × 10 = c) 5.116 × 10 =
d) 0.522 × 10 = e) 1.017 × 10 = f) 6.305 × 10 =
g) 1.602 × 100 = h) 15.925 × 100 = i) 34.007 × 100 =
j) 0.632 × 100 = k) 1.052 × 100 = l) 86.927 × 100 =

2 Answer these.
a) 14.6 ÷ 10 = b) 81.7 ÷ 10 = c) 4.35 ÷ 10 =
d) 0.6 ÷ 10 = e) 4.31 ÷ 10 = f) 8.25 ÷ 10 =
g) 3.4 ÷ 100 = h) 18.2 ÷ 100 = i) 7.5 ÷ 100 =
j) 34.6 ÷ 100 = k) 1.8 ÷ 100 = l) 0.4 ÷ 100 =

8

3 Copy and complete these. Use ×10, ×100, ÷10 or ÷100.
a) 3.2 → □ → 0.032 b) 6.213 → □ → 621.3
c) 45.382 → □ → 453.82 d) 8.271 → □ → 827.1
e) 0.006 → □ → 0.6 f) 14.8 → □ → 0.148
g) 27.385 → □ → 2738.5 h) 8.07 → □ → 0.807

4 Answer these.
a) What number does 4.145 have to be multiplied by to get 414.5?
b) What number does 17.1 have to be divided by to get 0.171?
c) A number is multiplied by 10 to give 6.15. What is the number?
d) What number divided by 100 gives 0.125?
e) A number is divided by 100 to give 0.041. What is the number?
f) A number is multiplied by 100 to give 34.8. What is the number?
g) What number multiplied by 100 gives 7.8?
h) What number divided by 100 gives 0.399?

Try this

The 6 in 236.1 is two columns away from the 6 in 2.361. It is 100 times greater.
The 8 in 35.68 is two columns away from the 8 in 3568. It is 100 times smaller.
Answer these.
a) What would you multiply the 8 in 48.5 by, to give it the same value as the 8 in 485?
b) What would you multiply the 5 in 7.315 by, to give it the same value as the 5 in 73.15?
c) What would you divide the 6 in 467.5 by, to give it the same value as the 6 in 4.675?
d) How many times greater is the 1 in 21.75 than the 1 in 2.175?
e) How many times smaller is the 3 in 1.039 than the 3 in 103.9?

9

Activities

- Write numbers such as 7, 15, 32, 50 on the board in a horizontal line. Ask the class to multiply each number by 10 and record each multiple below the appropriate number so that the 0 is directly below the units. Ask the class to multiply the original numbers by 100, record below the multiples of 10, aligning the digits in columns. Ask, 'What happens when we multiply a number by 10? What about multiplying by 100?' Establish the way in which the digits are moved to the left and the empty columns filled with zeros.
- Look at page 8 and go through the introduction with the class. Work through further examples of multiplying and dividing decimals by 10 and by 100 with the class, recording on the board in the same way as those in the introduction, e.g. 4.6 ÷ 10, 1.235 × 100, 7 ÷ 100, 12.007 × 10.

Where appropriate point out that zeros on the end of decimals have no relevance to their value.

Answers

1 a) 4.13 b) 92.81 c) 51.16 d) 5.22
e) 10.17 f) 63.05 g) 160.2 h) 1592.5
i) 3400.7 j) 63.2 k) 105.2 l) 8692.7

2 a) 1.46 b) 8.17 c) 0.435 d) 0.06
e) 0.431 f) 0.825 g) 0.034 h) 0.182
i) 0.075 j) 0.346 k) 0.018 l) 0.004

3 a) ÷ 100 b) × 100 c) × 10 d) × 100
e) × 100 f) ÷ 100 g) × 100 h) ÷ 10

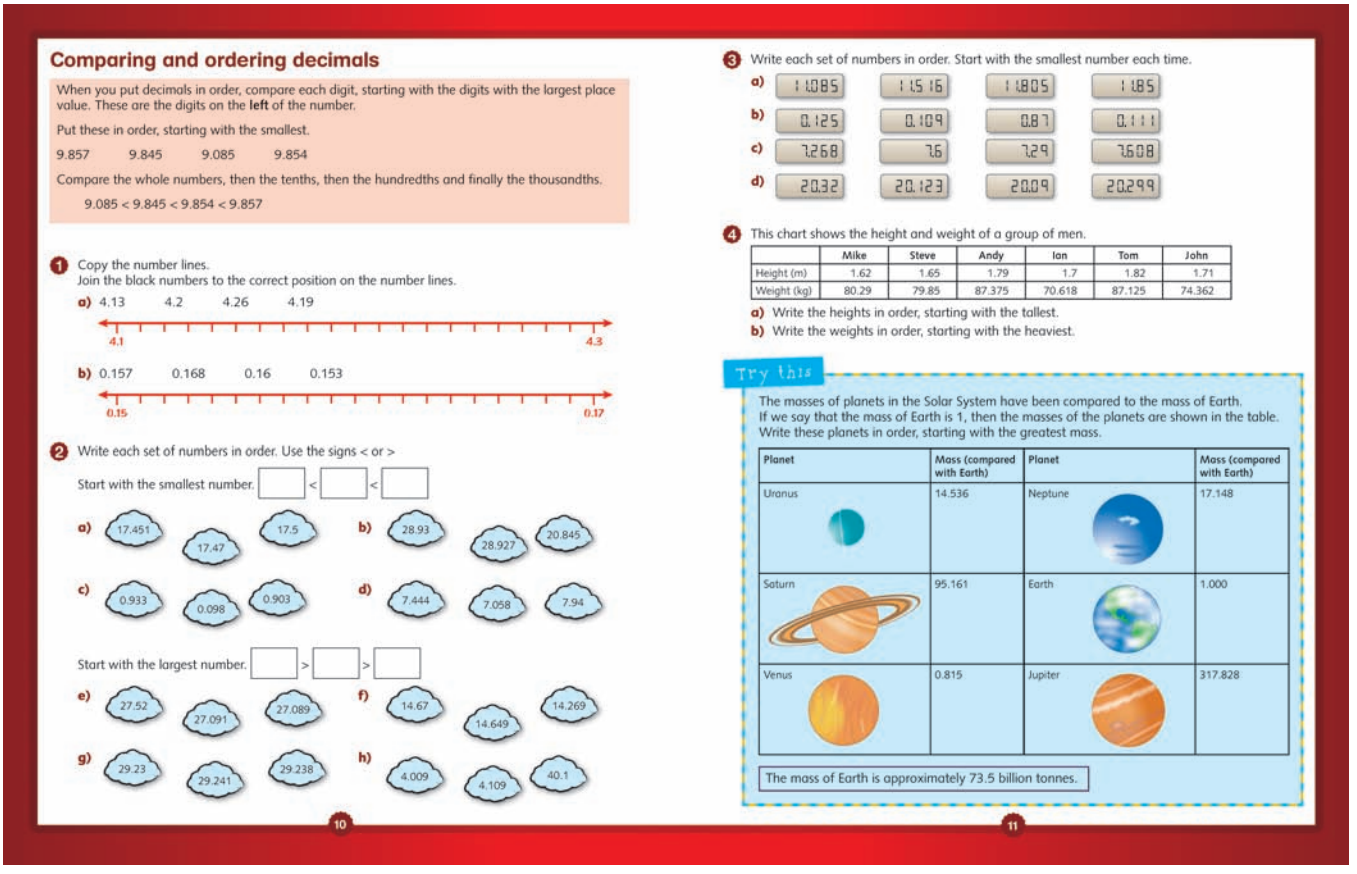
4 a) 100 b) 100 c) 0.615 d) 12.5
e) 4.1 f) 0.348 g) 0.078 h) 39.9

Try this

a) 10 b) 10 c) 100 d) 10 d) 10 e) 100

Lesson 4 **Comparing and ordering decimals**

Pupil's Book pages 10 and 11 **Oral and mental starter: Hands up (include decimal numbers)**



Comparing and ordering decimals

When you put decimals in order, compare each digit, starting with the digits with the largest place value. These are the digits on the **left** of the number.

Put these in order, starting with the smallest.

9.857 9.845 9.085 9.854

Compare the whole numbers, then the tenths, then the hundredths and finally the thousandths.

9.085 < 9.845 < 9.854 < 9.857

1 Copy the number lines.
Join the black numbers to the correct position on the number lines.

a) 4.13 4.2 4.26 4.19

4.1 4.3

b) 0.157 0.168 0.16 0.153

0.15 0.17

2 Write each set of numbers in order. Use the signs < or >

Start with the smallest number. ☐ < ☐ < ☐

a) 17.451 17.47 17.5

b) 28.93 28.927 20.845

c) 0.933 0.098 0.903

d) 7.444 7.058 7.94

Start with the largest number. ☐ > ☐ > ☐

e) 27.52 27.091 27.089

f) 14.67 14.649 14.269

g) 29.23 29.241 29.238

h) 4.009 4.109 40.1

10

3 Write each set of numbers in order. Start with the smallest number each time.

a) 11.085 11.516 11.805 11.85

b) 0.125 0.109 0.87 0.111

c) 7.268 7.6 7.29 7.608

d) 20.32 20.123 20.09 20.299

4 This chart shows the height and weight of a group of men.

	Mike	Steve	Andy	Ian	Tom	John
Height (m)	1.62	1.65	1.79	1.7	1.82	1.71
Weight (kg)	80.29	79.85	87.375	70.618	87.125	74.362

a) Write the heights in order, starting with the tallest.
b) Write the weights in order, starting with the heaviest.

Try this

The masses of planets in the Solar System have been compared to the mass of Earth.
If we say that the mass of Earth is 1, then the masses of the planets are shown in the table.
Write these planets in order, starting with the greatest mass.

Planet	Mass (compared with Earth)	Planet	Mass (compared with Earth)
Uranus	14.536	Neptune	17.148
Saturn	95.161	Earth	1.000
Venus	0.815	Jupiter	317.828

The mass of Earth is approximately 73.5 billion tonnes.

11

Activities

- Look at page 10 and go through the introduction with the class. Ask pupils to give the place value of each digit in each of the numbers. Write a number such as 0.579 on the board and ask the class to read it aloud together. Ask, 'Which digit has the largest value? Why? Which has the smallest value? Why?' Repeat with a number such as 2.368.
- Write a set of decimal numbers such as 3.25, 3.007, 3.209, 3.098 on the board and ask pupils to say which is the smallest, and then the next smallest, the next smallest and then the largest. Each time ask them to explain their choice.
- Write the numbers out again, starting with the smallest, using < signs between them. Ask the class to read the whole statement aloud together. Repeat, starting with the largest number and using > signs.

Answers

1 Check that each number is in the correct place on the number line.

2 a) 17.451 < 17.47 < 17.5
b) 20.845 < 28.297 < 28.93
c) 0.098 < 0.903 < 0.933
d) 7.058 < 7.444 < 7.94
e) 27.52 > 27.091 > 27.089
f) 14.67 > 14.649 > 14.269
g) 29.241 > 29.238 > 29.23
h) 40.1 > 4.109 > 4.009

3 a) 11.085, 11.516, 11.805, 11.85
b) 0.109, 0.111, 0.125, 0.87
c) 7.268, 7.29, 7.6, 7.608
d) 20.09, 20.123, 20.299, 20.32

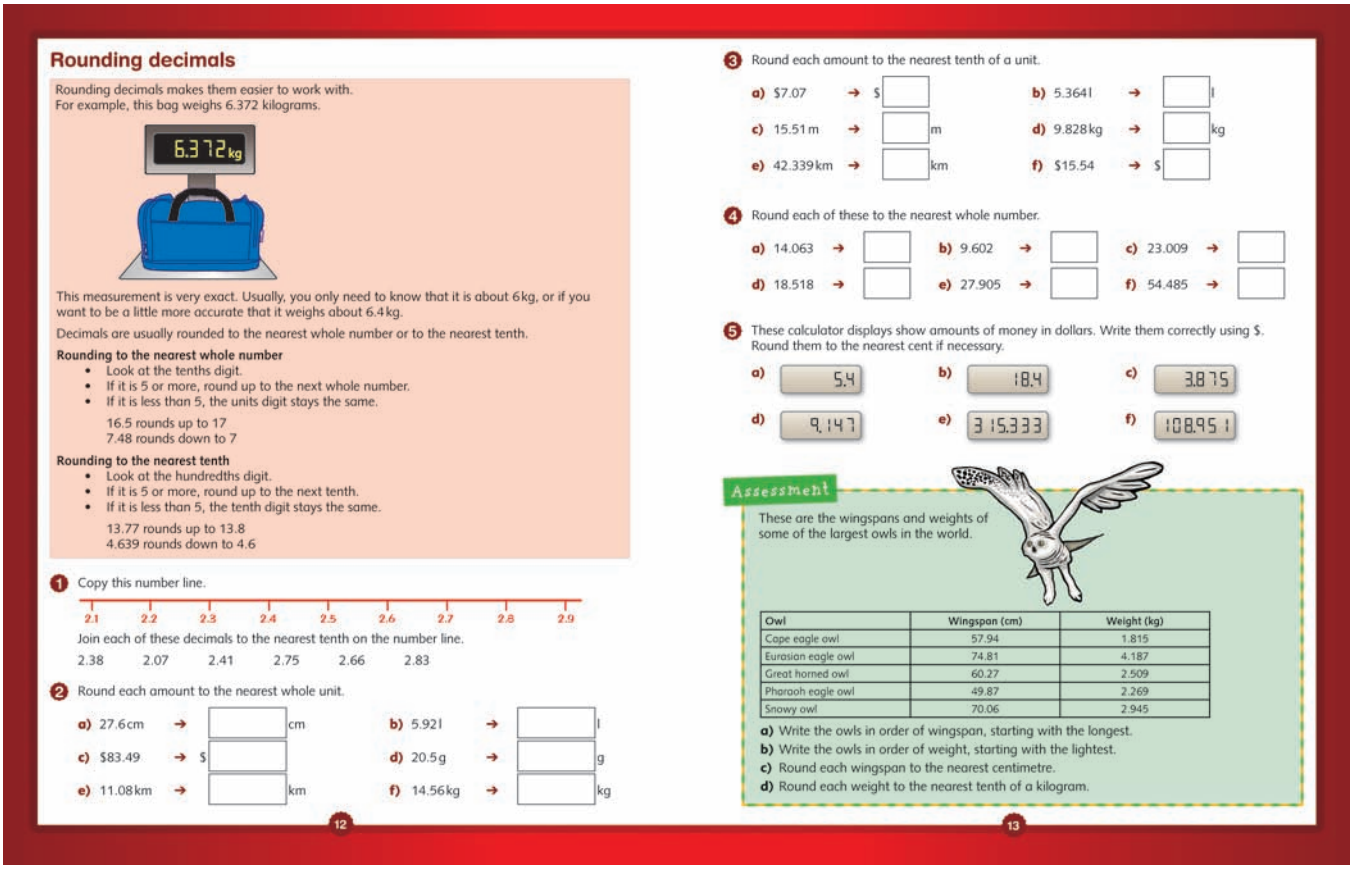
4 a) 1.82 m, 1.79 m, 1.71 m, 1.7 m, 1.65 m, 1.62 m
b) 87.375 kg, 87.125 kg, 80.29 kg, 79.85 kg, 74.362 kg, 70.168 kg

Try this

Jupiter 317.828, Saturn 95.161, Neptune 17.148, Uranus 14.536, Earth 1, Venus 0.815

Lesson 5 **Rounding decimals**

Pupil's Book pages 12 and 13 **Oral and mental starter: Equal parts (including decimals)**



Rounding decimals

Rounding decimals makes them easier to work with.
For example, this bag weighs 6.372 kilograms.

This measurement is very exact. Usually, you only need to know that it is about 6 kg, or if you want to be a little more accurate that it weighs about 6.4 kg.

Decimals are usually rounded to the nearest whole number or to the nearest tenth.

Rounding to the nearest whole number

- Look at the tenths digit.
- If it is 5 or more, round up to the next whole number.
- If it is less than 5, the units digit stays the same.

16.5 rounds up to 17
7.48 rounds down to 7

Rounding to the nearest tenth

- Look at the hundredths digit.
- If it is 5 or more, round up to the next tenth.
- If it is less than 5, the tenth digit stays the same.

13.77 rounds up to 13.8
4.639 rounds down to 4.6

1 Copy this number line.

2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9

Join each of these decimals to the nearest tenth on the number line.

2.38 2.07 2.41 2.75 2.66 2.83

2 Round each amount to the nearest whole unit.

a) 27.6 cm → ☐ cm
b) 5.92 l → ☐ l
c) $83.49 → $☐
d) 20.5 g → ☐ g
e) 11.08 km → ☐ km
f) 14.56 kg → ☐ kg

12

3 Round each amount to the nearest tenth of a unit.

a) $7.07 → $☐
b) 5.364 l → ☐ l
c) 15.51 m → ☐ m
d) 9.828 kg → ☐ kg
e) 42.339 km → ☐ km
f) $15.54 → $☐

4 Round each of these to the nearest whole number.

a) 14.063 → ☐
b) 9.602 → ☐
c) 23.009 → ☐
d) 18.518 → ☐
e) 27.905 → ☐
f) 54.485 → ☐

5 These calculator displays show amounts of money in dollars. Write them correctly using $. Round them to the nearest cent if necessary.

a) 5.4
b) 18.4
c) 3.875
d) 9.147
e) 315.333
f) 108.951

Assessment

These are the wingspans and weights of some of the largest owls in the world.

Owl	Wingspan (cm)	Weight (kg)
Cape eagle owl	57.94	1.815
Eurasian eagle owl	74.81	4.187
Great horned owl	60.27	2.509
Pharaoh eagle owl	49.87	2.269
Snowy owl	70.06	2.945

a) Write the owls in order of wingspan, starting with the longest.
b) Write the owls in order of weight, starting with the lightest.
c) Round each wingspan to the nearest centimetre.
d) Round each weight to the nearest tenth of a kilogram.

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Activities

- Write numbers such as 368, 17 652, 2 809 327 on the board and ask the class to round each one to the nearest 10. Record the approximation next to or below each number. Ask a volunteer to explain the rule for rounding up or down. Repeat, asking pupils to round each original number to the nearest hundred.
- Look at page 12 and go through the introduction with the class. Stress that rounding decimals to the nearest whole number or tenth follows the same process as rounding whole numbers.

Answers

1 Check decimals are joined to these tenths:
2.38 → 2.4, 2.07 → 2.1, 2.41 → 2.4, 2.75 → 2.8, 2.66 → 2.7, 2.83 → 2.8

2 a) 28 cm b) 6 l c) $83
d) 21 g e) 11 km f) 15 kg

3 a) $7.10 b) 5.4 l c) 15.5 m
d) 9.8 kg e) 42.3 km f) $15.50

4 a) 14 b) 10 c) 23 d) 19 e) 28 f) 54

5 a) $5.40 b) $18.40 c) $3.88
d) $9.15 e) $315.33 f) $108.95

Assessment

a) 74.81 cm, 70.06 cm, 60.27 cm, 57.94 cm, 49.87 cm
b) 1.815 kg, 2.269 kg, 2.509 kg, 2.945 kg, 4.187 kg
c) 58 cm, 75 cm, 60 cm, 50 cm, 70 cm
d) 1.8 kg, 4.2 kg, 2.5 kg, 2.3 kg, 2.9 kg