

UNIT 10

NUMBER: CALCULATIONS

SUGGESTED TIME **6 hours**

TEACHING OBJECTIVES

- Add several numbers.
- Add/subtract a multiple of 10 or 100 and adjust.
- Use relationship between addition and subtraction.
- Extend written methods to $\text{HTU} \times \text{U}$ and $\text{U.t} \times \text{U}$.
- Develop and refine written methods for division.
- Extend written methods to $\text{HTU} \div \text{U}$ (whole number remainder).
- Use all four operations to solve money or 'real life' word problems.
- Choose appropriate operations and calculation methods.
- Develop calculator skills and use a calculator effectively.
- Round whole numbers and decimals.
- Check by adding in reverse order, including with calculator.

SECTION 1 Mental calculations

SECTION 2 Multiplication

SECTION 3 Division I

SECTION 4 Division II

SECTION 5 Rounding

SECTION 6 Money and 'real life' problems

HOMEWORK

- Section 1, Star Challenges 1 and 2 revise mental addition and subtraction.
- Some pupils will need basic practice exercises in written methods of multiplication and division.
- Consolidate the solving of word problems, from the Star Challenges in Sections 2, 4, 5 and 6.

Unit **10****Checklist for pupils**UNIT
10

Mental calculations

- You will:
- add several numbers in your head
 - add multiples of 10 or 100
 - use the links between addition and subtraction

Multiplication

- You will:
- use a written method of multiplication
 - solve real life problems

Division I and II

- You will:
- use estimation to check answers
 - use a written method of division

Rounding

- You will:
- round decimals to the nearest whole number
 - round numbers to the nearest 10 or 100
 - use a written method of division

Money and 'real life' problems

- You will:
- practise using mental, written and calculator methods
 - use addition, subtraction, multiplication or division to solve word problems
-

UNIT 10

SECTION 1: MENTAL CALCULATIONS

DIRECT TEACHING POINTS

- Revise the range of mental strategies. You will need to refer to Section 6 of the *Framework for teaching mathematics from Reception to Year 6*.
- Consolidate recall of basic number bonds. Use exercises 1 and 2 as the basis of oral work.
- Revise compensation methods, for example, adding and subtracting near multiples of 10 and 100. Exercises 3 and 4 provide practice.
- Exercise 5 reinforces the relationship between addition and subtraction.

For example, $7 + 5 = 12$ $5 + 7 = 12$
 $12 - 7 = 5$ $12 - 5 = 7$

Mental calculations

1 Adding numbers in your head

- | | | | | | | | |
|---|---------------------|---|-------|----|---------------------|---|-------|
| 1 | $4 + 2 + 3 + 6$ | = | ..... | 6 | $8 + 5 + 2 + 5 + 3$ | = | ..... |
| 2 | $8 + 2 + 6 + 4$ | = | ..... | 7 | $9 + 2 + 3 + 3$ | = | ..... |
| 3 | $7 + 1 + 3 + 4$ | = | ..... | 8 | $6 + 6 + 3 + 5$ | = | ..... |
| 4 | $6 + 9 + 2 + 2 + 1$ | = | ..... | 9 | $1 + 7 + 7 + 5$ | = | ..... |
| 5 | $3 + 3 + 3 + 5 + 1$ | = | ..... | 10 | $3 + 5 + 7 + 5 + 5$ | = | ..... |

2 Adding multiples of 10 or 100

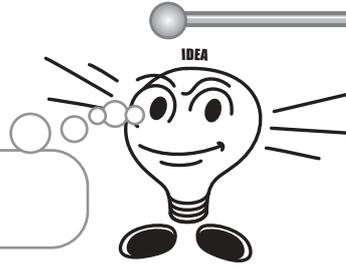


- | | | | | | | | |
|---|---------------------|---|-------|----|---------------------|---|-------|
| 1 | $4 + 2 + 3 + 5$ | = | ..... | 6 | $600 + 200 + 100$ | = | ..... |
| 2 | $40 + 20 + 30 + 50$ | = | ..... | 7 | $80 + 40 + 30 + 10$ | = | ..... |
| 3 | $70 + 20 + 10$ | = | ..... | 8 | $200 + 700 + 400$ | = | ..... |
| 4 | $80 + 30 + 10$ | = | ..... | 9 | $90 + 30 + 10 + 50$ | = | ..... |
| 5 | $50 + 70 + 20$ | = | ..... | 10 | $80 + 70 + 50$ | = | ..... |

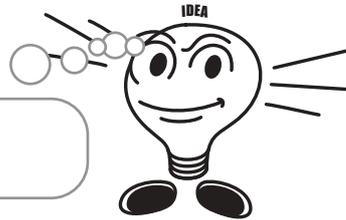
Mental calculations

3

Adding and subtracting 9, 19, 29, ... 11, 21, 31, ...

Example $345 + 29 = ?$ $345 + 30 = 375,$
so $345 + 29 = 374$ 

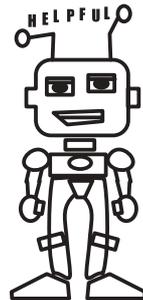
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|---|------------------------------|---|------------------------------|---|------------------------------|
| 1 | $327 + 19 = \dots\dots\dots$ | 4 | $617 + 49 = \dots\dots\dots$ | 7 | $317 + 51 = \dots\dots\dots$ |
| 2 | $543 + 39 = \dots\dots\dots$ | 5 | $468 + 31 = \dots\dots\dots$ | 8 | $513 + 69 = \dots\dots\dots$ |
| 3 | $238 + 41 = \dots\dots\dots$ | 6 | $752 + 39 = \dots\dots\dots$ | 9 | $158 + 19 = \dots\dots\dots$ |

Example $471 - 29 = ?$ $471 - 30 = 441,$
so $471 - 29 = 442$ 

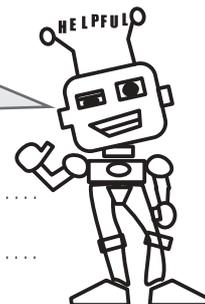
- | | | | | | |
|----|------------------------------|----|------------------------------|----|------------------------------|
| 10 | $255 - 41 = \dots\dots\dots$ | 12 | $593 - 49 = \dots\dots\dots$ | 14 | $266 - 29 = \dots\dots\dots$ |
| 11 | $183 - 29 = \dots\dots\dots$ | 13 | $703 - 51 = \dots\dots\dots$ | 15 | $871 - 39 = \dots\dots\dots$ |

4

Other adjustments when adding or subtracting

Example $268 + 95 = ?$ $268 + 100 = 368,$
so $268 + 95 = 363$ 

- | | | | | | |
|---|-------------------------------|---|-------------------------------|---|-------------------------------|
| 1 | $276 + 98 = \dots\dots\dots$ | 3 | $490 + 296 = \dots\dots\dots$ | 5 | $271 + 499 = \dots\dots\dots$ |
| 2 | $367 + 203 = \dots\dots\dots$ | 4 | $483 + 305 = \dots\dots\dots$ | 6 | $638 + 390 = \dots\dots\dots$ |

Example $579 - 196 = ?$ $579 - 200 = 379,$
so $579 - 196 = 383$ 

- | | | | | | |
|---|-------------------------------|----|-------------------------------|----|-------------------------------|
| 7 | $342 - 99 = \dots\dots\dots$ | 9 | $728 - 295 = \dots\dots\dots$ | 11 | $506 - 297 = \dots\dots\dots$ |
| 8 | $614 - 404 = \dots\dots\dots$ | 10 | $759 - 293 = \dots\dots\dots$ | 12 | $991 - 392 = \dots\dots\dots$ |

Mental calculations



One-star mental challenge



14-16 correct 1 star

1 $4 + 10 + 6 = \dots\dots\dots$ 3 $70 + 20 + 40 + 10 = \dots\dots\dots$

2 $7 + 1 + 9 + 5 = \dots\dots\dots$ 4 $200 + 400 + 300 = \dots\dots\dots$

5 $23 + 39 = \dots\dots\dots$ 7 $240 + 99 = \dots\dots\dots$ 9 $692 + 203 = \dots\dots\dots$

6 $47 - 21 = \dots\dots\dots$ 8 $568 - 97 = \dots\dots\dots$ 10 $457 - 49 = \dots\dots\dots$

11 $625 + 258 = 883$
 $883 - 258 = \dots\dots\dots$ $883 - 625 = \dots\dots\dots$

12 131 721 590

Write down the four number facts that connect these numbers.

.....



Two-star mental challenge



15-16 correct 2 stars
 12-14 correct 1 star

1 $7 + 8 + 9 + 5 = \dots\dots\dots$ 3 $60 + 30 + 50 + 70 = \dots\dots\dots$

2 $13 + 6 + 7 + 14 = \dots\dots\dots$ 4 $800 + 700 + 200 = \dots\dots\dots$

5 $238 + 79 = \dots\dots\dots$ 7 $367 + 298 = \dots\dots\dots$ 9 $598 + 197 = \dots\dots\dots$

6 $562 - 49 = \dots\dots\dots$ 8 $613 - 295 = \dots\dots\dots$ 10 $657 - 39 = \dots\dots\dots$

11 $714 + 273 = 987$
 $987 - 275 = \dots\dots\dots$ $987 - 718 = \dots\dots\dots$

12 64 28 36 92

Write down some number facts that connect these numbers eg. $28 + 36 = 64$.

.....

DIRECT TEACHING POINTS

- Make sure that pupils' recall of multiplication bonds is secure before moving on to written methods of multiplication.
- Pupils need an efficient, accurate written method for multiplication. You must decide which pupils should consolidate the grid method (Unit 6) and who might move on to a compact method. It is better that pupils are secure in the grid method rather than rushed on to a compact method that they do not fully understand. You may need to alter the layout to match that with which pupils are familiar.

$$735 \times 6$$

×	700	30	5	
6	4200	180	30	= 4410

Here is another way of setting out:

735×6	7 3 5	
	× 6	
	3 0	6×5
	1 8 0	6×30
	4 2 0 0	6×700
Adding	4 4 1 0	6×735
	1	

$$253 \times 4$$

2	5	3	
	×	4	
1	0	1	2
2	1		

Step 1
 $4 \times 3 = 12$

Step 2
 $4 \times 50 = 200$

Step 3
 $4 \times 200 = 800$

- For some pupils you will need to model multiplication of decimals using the grid method.
- Remind pupils to use estimates to check calculations – this helps locate the decimal point.
- Star Challenges 3, 4, 5 and 6 provide some simple applications of multiplication. All pupils will need practice at solving word problems in preparation for answering test questions.



multiplication multiply multiple product

Multiplication**1****Multiplication**

1 231×3

4 581×8

7 547×5

2 342×5

5 215×3

8 823×6

3 175×7

6 324×9

9 294×7

Multiplication

2

Multiplying money and measurements

You may be able to work some out in your head.

1 $£3.20 \times 3$

4 $4.6 \text{ m} \times 8$

7 $£7.10 \times 6$

2 $£5.40 \times 3$

5 $5.3 \text{ m} \times 6$

8 $6.2 \text{ m} \times 7$

3 $£3.50 \times 7$

6 $£9.60 \times 5$

9 $4.9 \text{ m} \times 3$

Multiplication



Solving problems



5 correct 2 stars
4 correct 1 star

1 Trendy Sports sells table tennis balls in boxes that each hold 5 balls. The Flashy Sports Shop buys 135 boxes. How many table tennis balls did the shop buy?

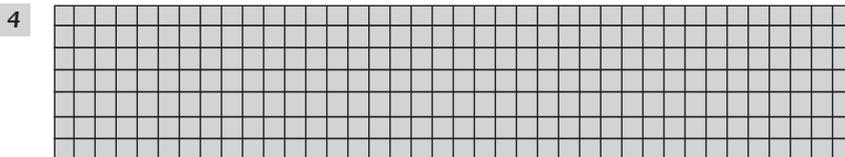
.....

2 The Bulk Sports Factory makes table tennis balls. The balls are packed in boxes of 144. Trendy Sports buys 7 boxes. How many table tennis balls are there in 7 boxes?

.....

3 Melanie sells TVs in her shop. She buys some TVs, costing £357 each. Work out the cost of 5 TVs.

.....



How many tiles are there in this diagram?

5 Vikram wants to measure the length of his lawn. He lays garden canes end to end. Each cane is 1.7 m long. His lawn is 9 canes long.



How long is the lawn in metres?

.....

Multiplication



4

Different totals



14 marks 2 stars
11-13 marks 1 star

- 1 (a) Make multiplication questions using the digits **2, 3, 5** in the boxes. There are six different answers. (6 marks)

$$\square \square \square \times 6 =$$

- (b) What is the largest answer you can get? (1 mark)

.....

- 2 (a) Make six different multiplications using the digits **3, 4, 7**. (6 marks)

$$\square \square \times \square =$$

- (b) What is the smallest answer you can get? (1 mark)

.....

Multiplication



5

'Real life' problems



All correct 1 star

1 A garden cane is 1.3 m long.
My lawn is exactly 6 canes long.
How long is the lawn in metres?

.....

2 My shoe is 0.3 m long.
The garden path is 9 shoe lengths long.
How long is the garden path?

.....

3 My pencil is 9.2 cm long.
My desk is 6 pencil lengths wide.
How wide is the desk in cm?

.....

4 One brick is 8.5 cm long.
7 bricks are placed side by side, with 1 cm of mortar in between.
Work out the distance across the 7 bricks.

.....



6

Arithmetic puzzles



All correct 1 star

1 Work out the missing number.

$$3 \times \dots + 7 = 25$$

2 What are the two missing operations?

$$3 \dots 14 \dots 5 = 37$$

3 Work out the missing digit. $25 \square \times 4 = 1036$

UNIT 10

SECTIONS 3 AND 4: DIVISION I AND II

DIRECT TEACHING POINTS

- Teach the variety of language and notation associated with division. Section 4, exercise 2 and Star Challenge 8 provide practice.
- Consolidate the recall of division facts and the relationship between multiplication and division, for example $45 \div \square = 9$ is equivalent to $9 \times \square = 45$ or $45 \div 9 = \square$.
- Discuss with the pupils which calculations ought to be done mentally and which need a written method. Note that the support sheets do not always serve as pupil answer sheets.
- Encourage pupils to precede any written calculation with an estimate. This can provide a focus for oral work.
- Support pupils in refining their written method of division. This may be 'chunking'. Chunking needs to be efficient; that is, not single multiples but progressing through (say) 10 multiples to a 'chunk' based on an estimate. Some pupils may be comfortable with a standard method. Demonstrate methods appropriate to pupils in your group.

135 ÷ 6

$$\begin{array}{r}
 135 \\
 5 \times 6 \quad \underline{-30} \\
 105 \\
 10 \times 6 \quad \underline{-60} \\
 45 \\
 5 \times 6 \quad \underline{-30} \\
 15 \\
 2 \times 6 \quad \underline{-12} \\
 3
 \end{array}$$

So, $135 \div 6 = 22 \text{ rem } 3$

There are 22 sixes in 135 and 3 leftover.

167 ÷ 7

$$\begin{array}{r}
 167 \\
 10 \times 7 = 70 \quad 20 \times 7 = 140 \quad 30 \times 7 = 210 \\
 20 \times 7 \quad \underline{-140} \\
 27 \\
 3 \times 7 \quad \underline{-21} \\
 6
 \end{array}$$

So, $167 \div 7 = 23 \text{ rem } 6$

167 is between 140 and 210,

so the answer is between 20 and 30.

This makes it quicker to start by taking away a chunk of 20×7 .

207 ÷ 6

$30 \times 6 = 180$ which is less than 207.

$40 \times 6 = 240$ which is more than 207.

So the first digit in the answer is 3 in the tens column. (30)

$$207 - 180 = 27$$

$$27 \div 6 = 4 \text{ rem } 3$$

$$\begin{array}{r}
 34 \text{ rem } 3 \\
 6 \overline{) 207}
 \end{array}$$



divide division remainder share

Division I

1

Division using related multiplication facts

1 $20 \div 5 = \dots\dots\dots$

5 $63 \div 7 = \dots\dots\dots$

9 $72 \div \dots\dots\dots = 9$

2 $35 \div 5 = \dots\dots\dots$

6 $54 \div 9 = \dots\dots\dots$

10 $150 \div 50 = \dots\dots\dots$

3 $28 \div 7 = \dots\dots\dots$

7 $42 \div 7 = \dots\dots\dots$

11 $125 \div 25 = \dots\dots\dots$

4 $27 \div 9 = \dots\dots\dots$

8 $48 \div \dots\dots\dots = 8$

12 $250 \div 25 = \dots\dots\dots$

2

Division



1 $89 \div 7 = ?$

4 $65 \div 3 = ?$

2 $142 \div 5 = ?$

5 $117 \div 6 = ?$

3 $71 \div 4 = ?$

6 $79 \div 7 = ?$

Division I

3

Estimate then work out

Batch A: 1 $93 \div 6$ 2 $162 \div 8$ 3 $259 \div 5$ 4 $324 \div 7$ Batch B: 1 $64 \div 3$ 2 $190 \div 5$ 3 $275 \div 8$ 4 $441 \div 9$ Batch C: 1 $167 \div 8$ 2 $368 \div 6$ 3 $259 \div 7$

STAR CHALLENGE

7

Increasing in difficulty



Complete these division questions.
You should be able to do some of them in your head.

12 correct 1 star

1 $15 \div 3$

4 $31 \div 9$

7 $85 \div 7$

10 $189 \div 8$

2 $22 \div 7$

5 $120 \div 3$

8 $154 \div 10$

11 $351 \div 7$

3 $23 \div 5$

6 $91 \div 4$

9 $237 \div 7$

12 $203 \div 9$

Division II

1

Review of division



Complete these questions. You choose your method.
Show any working out.

1 $74 \div 3$

5 $95 \div 2$

9 $86 \div 3$

2 $275 \div 5$

6 $472 \div 5$

10 $247 \div 6$

3 $362 \div 8$

7 $285 \div 3$

11 $652 \div 5$

4 $547 \div 9$

8 $936 \div 8$

12 $543 \div 4$

Division II

2

You choose which method to use

Share 20 between 4

Divide 20 by 4

$$20 \div 4$$

20 divided by 4

$$\frac{1}{4} \text{ of } 20$$

These all mean
'How many 4s are
there in 20?'



If you work the answer out in your head, write down the answer. Otherwise, show how you worked it out.

1 Divide 24 by 4

5 31 divided by 10

9 $643 \div 7$

2 $13 \div 5$

6 $578 \div 8$

10 How many 8s are there in 256?

3 Share 22 among 3

7 $86 \div 2$

4 $27 \div 3$

8 $245 \div 6$

STAR CHALLENGE

8

You choose the method



7-8 correct 1 star

1 Divide 48 by 4

4 $35 \div 7$

7 $329 \div 8$

2 $37 \div 5$

5 $87 \div 6$

8 How many 9s are there in 431?

3 Share 29 between 3

6 $236 \div 4$

Division II



Word problems



All correct 2 stars
4 correct 1 star

1 Carol bought 6 CDs.
They were all the same price.
She paid £84.
What was the cost of one CD?

.....

2 Sue orders goods for a large supermarket.
She ordered 864 eggs last week.
The eggs came in six identical boxes.
How many eggs were in each box?

.....

3 Earl bought 5 birthday cards.
They were all the same price.
Earl got 5p change from £1.
What was the cost of one birthday card?

.....

4 Dad bought 7 plane tickets.
The total cost was £875.
What was the cost of one ticket?

.....

5 Bill bought 8 identical TVs to sell in his shop.
The total cost was £992.
Work out the cost of one TV.

.....

UNIT 10

SECTION 5: ROUNDING

DIRECT TEACHING POINTS

- You need to explain and demonstrate the ideas of rounding. Many of the exercises in this section can be done orally, but number lines provide a useful support. Use exercise 1 on an OHT.
- Discuss and clarify pupils' understanding of examples such as 'round 546 to the nearest 10' (550) and 'round 546 to the nearest 100' (500). Compare the two answers. What happens if you round 550 to nearest hundred?
- You need to explain the convention 'rounding 5s upwards'.
- Make sure that all pupils try some of the Star Challenges 10, 11, 12 which use different contexts for rounding.

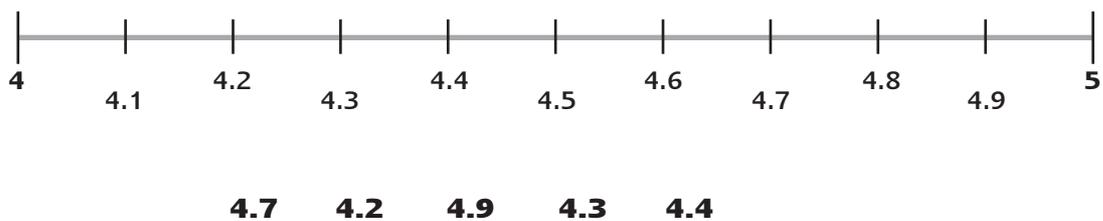
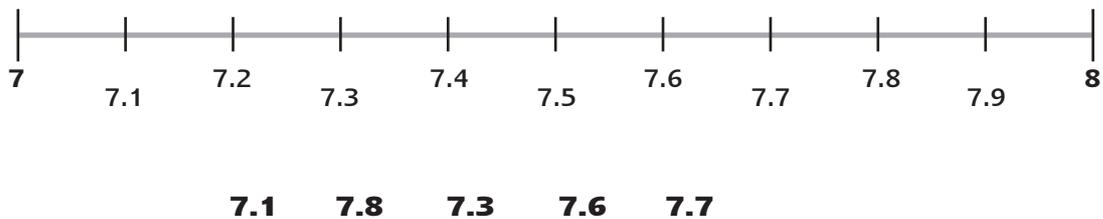
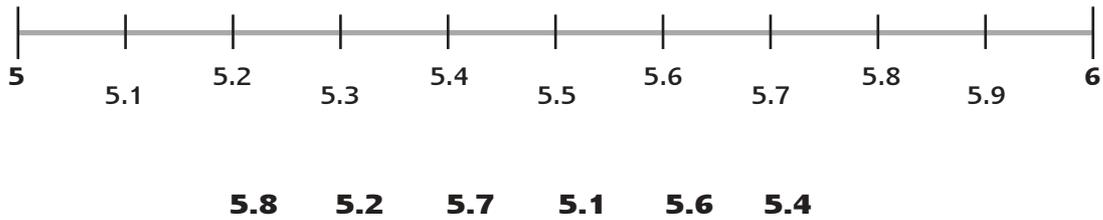
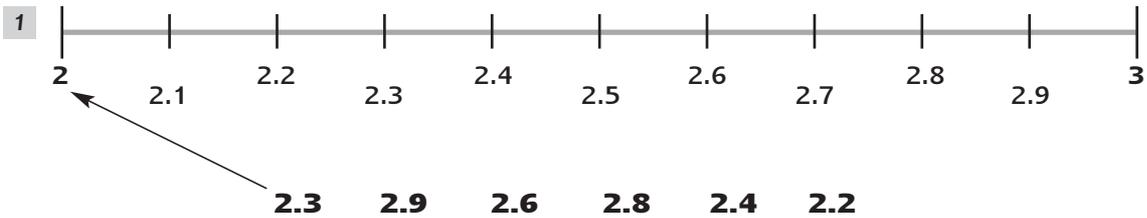


*round to the nearest whole number round to the nearest 10
round to the nearest 100 round to 1 decimal place*

Rounding numbers

1 Rounding diagrams

Complete the diagrams by drawing arrows from each decimal to the nearest whole number on the number lines.



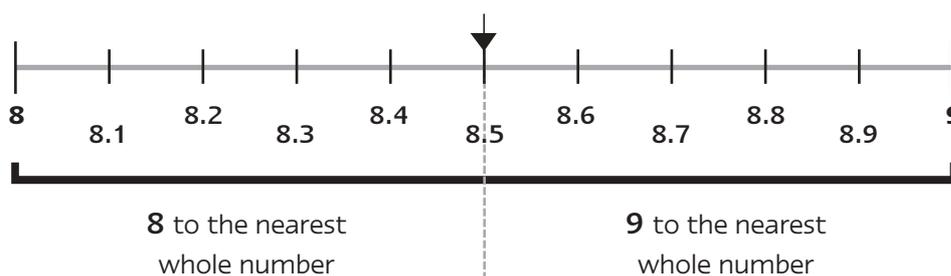
Rounding numbers

2

Rounding rules

Example

Numbers that end in .5 are exactly halfway between two whole numbers. It has been agreed that everyone will round *up* these middle numbers; 8.5 is rounded to 9, and so on.



Round each of these numbers to the nearest whole number.

Batch A

- | | | | | | | | | |
|---|-----|-------|---|------|-------|----|------|-------|
| 1 | 2.5 | ..... | 5 | 9.2 | ..... | 9 | 6.1 | ..... |
| 2 | 5.5 | ..... | 6 | 3.7 | ..... | 10 | 13.2 | ..... |
| 3 | 4.5 | ..... | 7 | 12.3 | ..... | 11 | 12.5 | ..... |
| 4 | 2.7 | ..... | 8 | 10.5 | ..... | 12 | 16.4 | ..... |

Batch B

- | | | | | | | | | |
|---|------|-------|---|--------|-------|----|--------|-------|
| 1 | 4.14 | ..... | 5 | 8.82 | ..... | 9 | 1.7623 | ..... |
| 2 | 6.25 | ..... | 6 | 2.5632 | ..... | 10 | 2.34 | ..... |
| 3 | 7.66 | ..... | 7 | 13.745 | ..... | 11 | 1.49 | ..... |
| 4 | 9.34 | ..... | 8 | 11.68 | ..... | 12 | 13.52 | ..... |

Rounding numbers



Car engine capacities



All correct 1 star

For each car, give the engine capacity to the nearest litre.

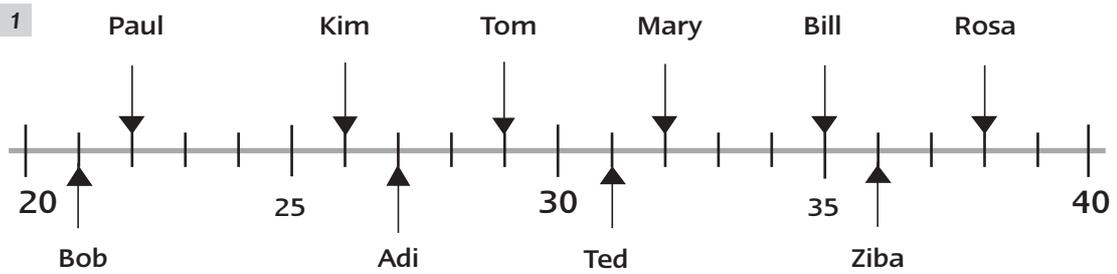
Car	Engine capacity	Capacity to nearest litre
Skoda 1.3 LX	1.3 l	1 litre
Ford Fiesta	1.117 l	..... l
Morgan 1.8 Roadster	1.8 l	..... l
Rover 1.4 GTa	1.4 l	..... l
Morris Ital	1.695 l	..... l
Nissan Sunny	1.809 l	..... l
Opel Senator	2.774 l	..... l
Renault Megane	1.998 l	..... l
Peugeot 1.6 GTi	1.6 l	..... l
Fiat Tipo	1.372 l	..... l
Jaguar XJS3	3.442 l	..... l

Rounding numbers



Rounding to the nearest 10 or 100

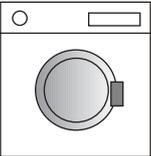
★ ★ ●
 28–29 correct 2 stars
 25–27 correct 1 star



Copy and complete this table:

Name	Adi	Ted	Bob	Ziba	Rosa	Mary	Kim	Paul	Tom	Bill
Age										
Age to nearest 10 years										

- 2 The price of this TV set is £539.
- 
- (a) Is £539 nearer to £500 or to £600?
 - (b) What is the TV's price to the nearest £100?
 - (c) Is £539 nearer to £530 or £540?
 - (d) What is the TV's price to the nearest £10?

- 3 The price of this washing machine is £685.
- 
- (a) What is its price to the nearest £100?
 - (b) What is its price to the nearest £10?

- 4 The price of this CD player is £164.
- 
- (a) What is its price to the nearest £100?
 - (b) What is the price to the nearest £50?
 - (c) What is the price to the nearest £10?

Rounding numbers



12

Football attendance



19-20 correct 2 stars

16-18 correct 1 star

Game	Attendance	Attendance to nearest 100	Attendance to nearest 1000
Millwall v Cambridge	4124	4100	.....
Walsall v Wigan	4769	.....	.....
Peterboro v Northampton	5231	.....	5000
Oxford v Oldham	2807	.....	.....
Bristol R v Colchester	5696	.....	.....
Port Vale v Notts County	3580	3600	.....
Reading v Bury	4155	.....	.....
Stoke v Bristol City	7538	.....	.....
Swindon v Luton	5855	.....	.....
Swansea v Brentford	5540	5500	.....
Bournemouth v Rotherham	3782	.....	.....
Wycombe v Wrexham	5490	.....	.....

UNIT 10

SECTION 6: MONEY AND 'REAL LIFE' PROBLEMS

DIRECT TEACHING POINTS

- Teach pupils how to tackle word problems.
 - pupils need practice in extracting information
 - deciding on an appropriate calculation
 - and then deciding the method of calculation, mental, written or calculator
 - they should interpret the answer in the context of the problem.
- Teach calculator skills, for example,  to cancel an entry, and ensure that pupils use calculators appropriately and efficiently.



how much? how many?

Money and 'real life' problems



1 Dividing with a calculator

Use your calculator to find the answers to these questions.

- 1 $254 \div 5 = ?$
- 2 105 divided by 6 = ?
- 3 $5 \div 8 = ?$
- 4 How many 8s are there in 176?

Check your answers. If you have any wrong, see your teacher.
The most common mistake is entering the numbers in the wrong order.

Now use your calculator to find the answers to these questions.
Give your answers to the nearest whole number.

- 5 $295 \div 13 =$
- 6 $6721 \div 8 =$
- 7 $8953 \div 17 =$
- 8 $6242 \div 34 =$

2 Choosing the correct operation (+, -, ×, ÷)

First write down the calculation you need to do.
Work out the answer.

- 1 Mary had £50 in her Savings Bank.
She drew out £15.
How much was left in the Bank?
- 2 Peter gets £3.50 a week pocket money.
On Friday, he looked after his baby sister.
His mother gave him £2.25, as well as his pocket money.
How much did she give him?
- 3 Sue's mother is twice as old as Sue.
Sue is 28 years old.
How old is her mother?
- 4 Dave earned £750.
He gave £210 to his mother.
How much did he have left?
- 5 Grandmother gave £820 to be shared equally
between four grandchildren.
How much did each one get?

Money and 'real life' problems

3

Choosing the operation and the method



Write down the calculation you need to do.
Work out the calculation by the most suitable method.

- 1 Plok is 165 Earth years old. Zuk is 28 years older than Plok.
How old is Zuk?

- 2 Starship 2001 is the biggest.
There are 48 officers and 764 crew on board.
How many officers and crew are there on board altogether?

- 3 How many more crew members are there than officers on Starship 2001?

- 4 Ruff from the planet Mudd is a crew member on Starship 2001. 198 of the 764 crew members come from Mudd.
How many crew members do not come from Mudd?

Money and 'real life' problems



Starship Challenges



All correct 2 stars
5 correct 1 star

- 1 On Starship 2001, 29 officers and 237 crew members come from the planet Klar.
How many on Starship 2001 come from Klar?
- 2 Apollo is the oldest on board Starship 2001.
Mercury is the youngest. Mercury is 46 Earth years old.
Apollo is 177 years older than Mercury.
How old is Apollo?

Numbers of explorers in the Andromeda Sector in Year 2145:

1756 officers
23 818 crew members
785 trainees

- 3 How many crew members and officers were there altogether in Andromeda in Year 2145?
- 4 How many explorers were there altogether in Andromeda in Year 2145?
- 5 In Spirea there are three times as many trainees as Andromeda.
How many trainees are there in Spirea?
- 6 Half the crew members in Andromeda are more than 100 years old.
How many crew members are more than 100 years old?

Unit 10 Answers

UNIT
10

Section 1

Mental calculations

1 Adding numbers in your head

1	15	6	23
2	20	7	17
3	15	8	20
4	20	9	20
5	15	10	25

2 Adding multiples of 10 or 100

1	14	6	900
2	140	7	160
3	100	8	1300
4	120	9	180
5	140	10	200

3 Adding and subtracting 9, 19, 29, ... 11, 21, 31, ...

1	346	4	666	7	368
2	582	5	499	8	582
3	279	6	791	9	177
10	214	12	544	14	237
11	154	13	652	15	832

4 Other adjustments when adding or subtracting

1	374	3	786	5	770
2	570	4	788	6	1028
7	243	9	433	11	209
8	210	10	466	12	599

Unit 10 Answers

Mental calculations

continued

5 Using related number facts

1 $954 - 273 = 681$

2 $705 - 705 = 286$

3 $143 + 257 = 400$ $400 - 257 = 143$

$400 - 143 = 257$

4 $375 - 249 = 126$ $249 + 126 = 375$

$126 + 249 = 375$

5 $243 + 357 = 600$ $357 + 243 = 600$

$600 - 357 = 243$ $600 - 243 = 357$

6 $20 \times 5 = 100$ $5 \times 20 = 100$

$100 \div 5 = 20$ $100 \div 20 = 5$

Section 2

Multiplication

1 Multiplication

1 693

4 4648

7 2735

2 1710

5 645

8 4938

3 1225

6 2916

9 2058

2 Multiplying money and measurements

1 £9.60

4 36.8 m

7 £42.60

2 £16.20

5 31.8 m

8 43.4 m

3 £24.50

6 £48

9 14.7 m

Unit 10 Answers

UNIT
10

Section 3

Division I

1 Division using related multiplication facts

1 4	5 9	9 8
2 7	6 6	10 3
3 4	7 6	11 5
4 3	8 6	12 10

2 Division

1 12 rem 5	4 21 rem 2
2 28 rem 2	5 19 rem 3
3 17 rem 3	6 11 rem 2

3 Estimate then work out

Batch A:	1 15 rem 3	2 20 rem 2	3 51 rem 4	4 46 rem 2
Batch B:	1 21 rem 1	2 38	3 34 rem 3	4 49
Batch C:	1 20 rem 7	2 61 rem 2	3 37	

Section 4

Division II

1 Review of division

1 24 rem 2	4 60 rem 7	7 95	10 41 rem 1
2 55	5 47 rem 1	8 117	11 130 rem 2
3 45 rem 2	6 94 rem 2	9 28 rem 2	12 135 rem 3

2 You choose which method to use

1 6	5 3 rem 1	9 91 rem 6
2 2 rem 3	6 72 rem 2	10 32
3 7 rem 1	7 43	
4 9	8 40 rem 5	

Unit 10 Answers

Section 5

Rounding numbers

2 Rounding rules

Batch A

1 3	5 9	9 6
2 6	6 4	10 13
3 5	7 12	11 13
4 3	8 11	12 16

Batch B

1 4	5 9	9 2
2 6	6 3	10 2
3 8	7 14	11 1
4 9	8 12	12 14

Section 6

Money and 'real life' problems

1 Dividing with a calculator

1 50.8	3 0.625	5 23	7 527
2 17.5	4 22	6 840	8 184

2 Choosing the correct operation (+, −, ×, ÷)

1 (a) $50 - 15$	(b) £35	4 (a) $750 - 210$	(b) £540
2 (a) $3.50 + 2.25$	(b) £5.75	5 (a) $820 \div 4$	(b) £205
3 (a) 2×28	(b) 56		

3 Choosing the operation and the method

1 (a) $165 + 28$	(b) 193
2 (a) $48 + 764$	(b) 812
3 (a) $764 - 48$	(b) 716
4 (a) $764 - 198$	(b) 566

Unit 10 Answers

Star Challenge answers



One-star mental challenge

14–16 correct 1 star

1 20

3 140

2 22

4 900

5 62

7 339

9 895

6 26

8 471

10 408

11 625 258

12 $131 + 590 = 721$

$590 + 131 = 721$

$721 - 590 = 131$

$721 - 131 = 590$



Two-star mental challenge

15–16 correct 2 stars
12–14 correct 1 star

1 29

3 210

2 40

4 1700

5 317

7 665

9 795

6 513

8 318

10 618

11 712 269

12 Any four of the following number facts:

$28 + 36 = 64$

$64 + 28 = 92$

$36 + 28 = 64$

$28 + 64 = 92$

$64 - 28 = 36$

$92 - 28 = 64$

$64 - 36 = 28$

$92 - 64 = 36$



Solving problems

5 correct 2 stars
4 correct 1 star

1 675

3 £1785

5 15.3 m

2 1008

4 266

Unit 10 Answers

Star Challenge answers

continued



4 Different totals

14 marks	2 stars
11-13 marks	1 star

1 (a)

2 3 5
× 6
1 4 1 0

2 5 3
× 6
1 5 1 8

3 2 5
× 6
1 9 5 0

3 5 2
× 6
2 1 1 2

5 2 3
× 6
3 1 3 8

5 3 2
× 6
3 1 9 2

(b) largest is 3192

2 (a) $34 \times 7 = 238$ $43 \times 7 = 301$ $37 \times 4 = 148$
 $73 \times 4 = 292$ $47 \times 3 = 141$ $74 \times 3 = 222$

(b) smallest is 141



5 'Real life' problems

All correct 1 star

1 7.8 m 2 2.7 m 3 55.2 cm 4 65.5 cm



6 Arithmetic puzzles

All correct 1 star

1 6 2 × and - 3 9



7 Increasing in difficulty

12 correct 1 star

1 5 4 3 rem 4 7 12 rem 1 10 23 rem 5
 2 3 rem 1 5 40 8 15 rem 4 11 50 rem 1
 3 4 rem 3 6 22 rem 3 9 33 rem 6 12 22 rem 5



8 You choose the method

7-8 correct 1 star

1 12 4 5 7 41 rem 1
 2 7 rem 2 5 14 rem 3 8 47 rem 8
 3 9 rem 2 6 59



9 Word problems

All correct	2 stars
4 correct	1 star

1 £14 2 144 3 19p 4 £125 5 £124

Unit 10 Answers

Star Challenge answers *continued*

Car engine capacities

All correct 1 star

Fiesta 1 litre	Morgan 2 l	Rover 1 l	Morris 2 l	Nissan 2 l	Opel 3 l
Renault 2 l	Peugeot 2 l	Fiat 1 l	Jaguar 3 l		



Rounding to the nearest 10 or 100

28–29 correct 2 stars
25–27 correct 1 star

1

Name	Adi	Ted	Bob	Ziba	Rosa	Mary	Kim	Paul	Tom	Bill
Age	27	31	21	36	38	32	26	22	29	35
Age to nearest 10 years	30	30	20	40	40	30	30	20	30	40

2 (a) £500 (b) £500 (c) £540 (d) £540

3 (a) £700 (b) £690

4 (a) £200 (b) £150 (c) £160



Football attendance

19–20 correct 2 stars
16–18 correct 1 star

Nearest 100	Nearest 1000
4100	4000
4800	5000
5200	5000
2800	3000
5700	6000
3600	4000
4200	4000
7500	8000
5900	6000
5500	6000
3800	4000
5500	5000



Starship Challenges

All correct 2 stars
5 correct 1 star

1 $29 + 237 = 266$

4 $1756 + 23\ 818 + 785 = 26\ 359$

2 $46 + 177 = 223$

5 $3 \times 785 = 2355$

3 $1756 + 23\ 818 = 25\ 574$

6 $23\ 818 \div 2 = 11\ 909$

