



PART 3

UNIT
15

SPRING
second half

NUMBER: CALCULATIONS

SECTION 1 Mental calculations – multiplication

SECTION 2 Mental calculations – division

SECTION 3 Multiplication – written methods

SECTION 4 Division – written methods

SECTION 5 Brackets

SECTION 6 Money and 'real life' problems

UNIT 15

NUMBER: CALCULATIONS

SUGGESTED TIME

6 hours

TEACHING OBJECTIVES

- Use closely related facts in mental calculations, for example, derive $\times 19$ from $\times 20$, $\times 12$ from $\times 10$ add $\times 2$.
- Partition to multiply mentally, for example, 47×6 .
- Use factors.
- Begin to use brackets.
- Express a quotient as a fraction or as a decimal when dividing whole numbers or when dividing £ and pence.
- Round up or down after division, depending on the context.
- Extend written methods of addition, subtraction, multiplication and division, including $TU \times TU$ and $ThHTU \div U$.
- Use all four operations to solve money or 'real life' word problems.
- Choose appropriate operations and calculation methods.
- Explain working. Check results.

SECTION 1 Mental calculations – multiplication

SECTION 2 Mental calculations – division

SECTION 3 Multiplication – written methods

SECTION 4 Division – written methods

SECTION 5 Brackets

SECTION 6 Money and 'real life' problems

HOMEWORK

- Exercise 4 in Section 1 consolidates mental calculations.
- Problems can be found in the Star Challenges in each section.

Unit **15****Checklist for pupils**UNIT
15**Mental calculations - multiplication**

You will:

- revise multiplying two-digit numbers by single-digit numbers in your head
- use these methods to solve problems

Mental calculations - division

You will:

- revise ways of dividing two-digit numbers by single-digit numbers in your head
- learn different ways of dealing with remainders
- solve problems

Multiplication - written methods

You will:

- solve problems

Division - written methods

You will:

- revise written methods of division
- solve problems

Brackets

You will:

- do calculations involving brackets
- choose the appropriate method for doing calculations

Money and 'real life' problems

You will:

- solve a range of problems and puzzles
- choose the appropriate calculation
- choose the appropriate method (mental, written or calculator)

UNIT 15

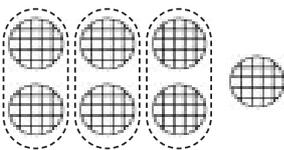
SECTIONS 1 AND 2 : MENTAL CALCULATIONS – MULTIPLICATION MENTAL CALCULATIONS – DIVISION

DIRECT TEACHING POINTS

- These two sections can support mental work throughout the unit.
- Consolidate all mental calculation strategies. You should refer to the *Framework for teaching mathematics from Reception to Year 6*, Section 6.
- Pupils are expected to recall and use multiplication facts and to multiply a two-digit number by a single-digit number mentally. Model this process by partitioning the two-digit number.
- Exercises 1, 2 and 3 provide practice of essential skills. You might use these as the basis of mental – oral sessions.
- Practise mental calculations in context. This is typical of real life situations and is also reflected in test questions. Star Challenge 2 provides practice examples.
- Pupils are expected to recall and use division facts and to divide a two-digit number by a single-digit number mentally.
- Concentrate on mental calculations in context. Exercise 1 and Star Challenge 4 provide examples.
- Teach remainders in the context of particular problems.

Share 7 pizzas among 3 people. How much does each person get?

Give your answer as a mixed number (whole number and fraction).

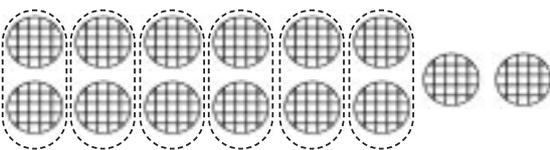


Each person gets 2 whole pizzas plus $\frac{1}{3}$ of a pizza.

Answer: $2\frac{1}{3}$

Share 14 pizzas among 3 people. How much does each person get?

Give your answer as a mixed number (whole number and fraction).



Each person gets 4 whole pizzas plus $2 \times \frac{1}{3}$ of a pizza.

Answer: $4\frac{2}{3}$

Each of the pizzas left over is divided into 3.

Each person gets $\frac{1}{3}$ of each of them.

Pupils need to use appropriate means of dealing with remainders – fractions, decimals or rounding. Consolidate simple decimal – fraction equivalents



division remainder fraction
decimal rounding
multiplication factor

Mental calculations - multiplication

1

Using related number facts

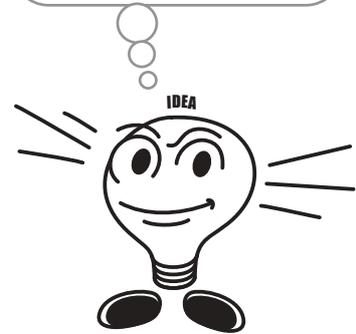


- | | |
|----------------------------|---------------------------|
| 1 $16 \times 20 =$ | 4 $63 \times 20 =$ |
| 2 $32 \times 30 =$ | 5 $15 \times 30 =$ |
| 3 $41 \times 40 =$ | 6 $8 \times 40 =$ |
| 7 $19 \times 17 =$ | 10 $22 \times 29 =$ |
| 8 $15 \times 19 =$ | 11 $34 \times 19 =$ |
| 9 $31 \times 21 =$ | 12 $37 \times 9 =$ |
| 13 $7 \times 50 =$ | 16 $15 \times 11 =$ |
| 14 $25 \times 50 =$ | 17 $50 \times 13 =$ |
| 15 $24 \times 12 =$ | 18 $13 \times 9 =$ |
| 19 $19 \times 18 =$ | |
| 20 $17 \times 200 =$ | |
| 21 $99 \times 5 =$ | |

Example

Work out 20×14 in your head.

$2 \times 14 = 28,$
 so $20 \times 14 = 280.$



2

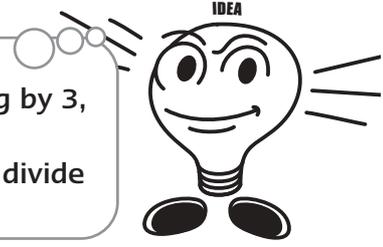
Using simple factors



Example

Work out 13×6 .

Since $6 = 3 \times 2$,
 multiplying by 6 is the same as multiplying by 3,
 then multiplying the answer by 2.
 To divide by 6, you could divide by 2, then divide
 the answer by 3.



- | | | |
|-------------------------|-------------------------|-------------------------|
| 1 $12 \times 6 =$ | 3 $12 \times 9 =$ | 5 $240 \div 20 =$ |
| 2 $15 \times 8 =$ | 4 $84 \div 14 =$ | 6 $135 \div 9 =$ |

Mental calculations - multiplication

3

Mental multiplication mixture



1 $18 \times 2 = \dots\dots\dots$ 7 $17 \times 5 = \dots\dots\dots$ 13 $15 \times 9 = \dots\dots\dots$

2 $13 \times 4 = \dots\dots\dots$ 8 $9 \times 40 = \dots\dots\dots$ 14 $41 \times 21 = \dots\dots\dots$

3 $25 \times 5 = \dots\dots\dots$ 9 $19 \times 22 = \dots\dots\dots$ 15 $36 \times 7 = \dots\dots\dots$

4 $26 \times 5 = \dots\dots\dots$ 10 $23 \times 200 = \dots\dots\dots$ 16 $45 \times 3 = \dots\dots\dots$

5 $72 \times 50 = \dots\dots\dots$ 11 $25 \times 30 = \dots\dots\dots$ 17 $72 \times 4 = \dots\dots\dots$

6 $14 \times 6 = \dots\dots\dots$ 12 $9 \times 6 = \dots\dots\dots$ 18 $12 \times 16 = \dots\dots\dots$

STAR CHALLENGE

1

One-star mental challenge



14-15 correct 1 star

Work out in your head:

1 $47 \times 2 = \dots\dots\dots$ 6 $19 \times 7 = \dots\dots\dots$ 11 $270 \div 9 = \dots\dots\dots$

2 $23 \times 4 = \dots\dots\dots$ 7 $31 \times 8 = \dots\dots\dots$ 12 $150 \div 3 = \dots\dots\dots$

3 $75 \times 3 = \dots\dots\dots$ 8 $64 \times 9 = \dots\dots\dots$ 13 $34 \times 200 = \dots\dots\dots$

4 $24 \times 50 = \dots\dots\dots$ 9 $36 \times 4 = \dots\dots\dots$ 14 $360 \div 6 = \dots\dots\dots$

5 $12 \times 25 = \dots\dots\dots$ 10 $15 \times 50 = \dots\dots\dots$ 15 $15 \times 25 = \dots\dots\dots$

Mental calculations - multiplication



2

Two-star mental challenge



All correct 2 stars
5-6 correct 1 star

Write down the calculation you need to do.
Work out the answer:

- 1 Brian pays £19 a month into a Savings Account.
How much will he have put in during a year?

.....

- 2 Eggs are packed in trays of 12.
Mary sells 35 trays of eggs to the supermarket.
How many eggs does she sell?

.....

- 3 I collect eggs that my hens lay.
The boxes I use hold 6 eggs.
Yesterday, I collected 162 eggs.
How many boxes did I fill?

.....

- 4 I buy 9 boxes of pencils.
There are 24 pencils in each box.
How many pencils do I get?

.....

- 5 A box of ping-pong balls has 15 balls in it.
I buy 11 boxes.
How many ping-pong balls do I get?

.....

- 6 Zip is 93 Earth years old.
His crewmate, Zap, is five years more than twice Zip's age.
How old is Zap?

.....

- 7 Jamie has 46 picture cards.
Robbie has four times as many.
How many cards does Robbie have?

.....

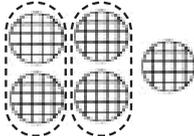
Mental calculations - division

1 Sharing problems



Work out how much each person gets when you share:

1 5 pizzas between 2 people

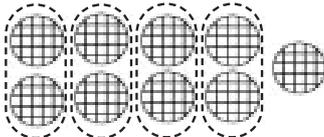


The pizza left over is divided into 2.

Answer:

Each person gets of it

2 9 pizzas among 4 people

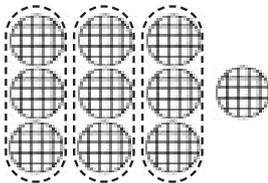


The pizza left over is divided into 4.

Answer:

Each person gets of it

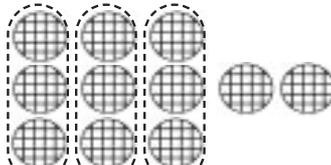
3 10 pizzas among 3 people



Answer:

Work out how much each person gets when you share:

4 11 pizzas among 3 people



Answer:

5 7 pizzas among 4 people



Answer:

2 Dividing whole numbers with fraction answers



Work out each division.

Give each answer as a mixed number (whole number and fraction).

1 $5 \div 2 = \dots\dots\dots$

6 $21 \div 2 = \dots\dots\dots$

11 $23 \div 7 = \dots\dots\dots$

2 $9 \div 2 = \dots\dots\dots$

7 $7 \div 4 = \dots\dots\dots$

12 $20 \div 9 = \dots\dots\dots$

3 $10 \div 3 = \dots\dots\dots$

8 $14 \div 3 = \dots\dots\dots$

13 $22 \div 3 = \dots\dots\dots$

4 $13 \div 4 = \dots\dots\dots$

9 $8 \div 5 = \dots\dots\dots$

14 $20 \div 7 = \dots\dots\dots$

5 $16 \div 5 = \dots\dots\dots$

10 $17 \div 5 = \dots\dots\dots$

15 $24 \div 5 = \dots\dots\dots$

Mental calculations - division

3

Common equivalent fractions and decimals



Write in the decimal equivalent of each fraction:

- | | | |
|-------------------------|--------------------------|-------------------------|
| 1 $\frac{1}{2} =$ | 4 $\frac{1}{10} =$ | 7 $\frac{1}{5} =$ |
| 2 $\frac{1}{4} =$ | 5 $\frac{3}{10} =$ | 8 $\frac{2}{5} =$ |
| 3 $\frac{3}{4} =$ | 6 $\frac{7}{10} =$ | 9 $\frac{4}{5} =$ |

Example

Write $2\frac{3}{5}$ in decimal form.

$\frac{3}{5} = 0.6$ so $2\frac{3}{5} = 2.6$

Write these numbers in decimal form:

- | | | |
|---------------------------|---------------------------|---------------------------|
| 10 $2\frac{1}{2} =$ | 11 $1\frac{3}{4} =$ | 12 $3\frac{4}{5} =$ |
|---------------------------|---------------------------|---------------------------|

4

Dividing whole numbers with decimal answers

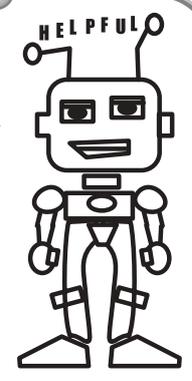


Example

$$17 \div 5 =$$

$$\begin{array}{r} 3.4 \\ 5 \overline{)17.20} \end{array}$$

Put a 0 after the decimal point of the whole number you are dividing.



Work out each division.
 Give your answer as a decimal.

- | | | |
|-----------------------|------------------------|-------------------------|
| 1 $9 \div 4 =$ | 5 $17 \div 4 =$ | 9 $11 \div 4 =$ |
| 2 $13 \div 2 =$ | 6 $23 \div 10 =$ | 10 $17 \div 10 =$ |
| 3 $11 \div 5 =$ | 7 $7 \div 2 =$ | 11 $15 \div 4 =$ |
| 4 $23 \div 5 =$ | 8 $25 \div 4 =$ | 12 $18 \div 5 =$ |

Mental calculations - division

STAR CHALLENGE
3

Division challenges



11-12 correct 2 stars
8-10 correct 1 star

Work out each division, giving each answer as a mixed number.

1 $11 \div 2 = \dots\dots\dots$

5 $15 \div 7 = \dots\dots\dots$

2 $15 \div 4 = \dots\dots\dots$

6 $37 \div 10 = \dots\dots\dots$

3 $13 \div 10 = \dots\dots\dots$

7 $11 \div 8 = \dots\dots\dots$

4 $13 \div 6 = \dots\dots\dots$

8 $25 \div 3 = \dots\dots\dots$

Give each answer as a decimal.

9 $9 \div 2 = \dots\dots\dots$

11 $11 \div 4 = \dots\dots\dots$

10 $21 \div 10 = \dots\dots\dots$

12 $13 \div 5 = \dots\dots\dots$

Practice
makes you
better.



STAR CHALLENGE
4

Problems



All correct 1 star

Write down the calculation you need to do.
Work out the answer.

- 1 Share £75 equally between Mary and Paul.
How much do they each get?

- 2 Divide £34 by 5.

- 3 Four cinema tickets cost £21.
What is the price of each ticket?

- 4 Six friends go ice-skating.
The cost for all six is £39.
What is the cost for one of them?

- 5 Five tins of dog food last three days.
How much is eaten each day?

UNIT 15

SECTION 3: MULTIPLICATION - WRITTEN METHODS SECTION 4: DIVISION - WRITTEN METHODS

DIRECT TEACHING POINTS

- Consolidate written methods of multiplication. This follows on from Unit 10.
- You will need to guide pupils to the grid or a compact method of multiplication as appropriate. Exercises 1, 2 and 3 provide practice examples for whatever method is chosen.

88×6

x	80	8	
6	480	48	

$88 \times 6 = 528$

253	Step 1	Step 2	Step 3
$\times 4$			
1012	253	253	253
21	$\times 4$	$\times 4$	$\times 4$
	2	12	1012
	1	21	21

24×36

x	20	4		
30	600	120	720	← row sum
6	120	24	144	← row sum
			864	← answer

- The Star Challenge provides a range of problems.
- Consolidate mental methods, for example:

1 Discuss ways of dividing each of these amounts by 2:

£2.40	£6.00	£5.00	
	£4.50	£6.30	£8.42
£1.50	£3.60	£7.10	
	£1.64	£3.22	£7.56

2 Discuss ways of dividing each of these amounts by 4:

£2.40	£6.00	£5.00	
	£4.60	£6.40	£5.28

3 Discuss ways of dividing each of these amounts by 3:

£3.60	£6.00	£4.50	
	£3.24	£6.15	£2.10

- Consolidate written methods of division. This section follows on from Unit 10. You will need to guide pupils to 'chunking' or a compact method as appropriate.
- Exercises 1, 2 and 3 provide a range of mental, written and calculator examples.
- For most exercises pupils will need to use an exercise book, rather than answer on the sheets.



divide division quotient
multiply multiplication product

Multiplication - written methods**1****TU × U**

1 36×4

2 68×5

3 27×5

4 49×7

2**HTU × U**

1 247×8

3 752×5

5 639×3

7 192×7

2 351×4

4 804×6

6 837×6

8 639×5

3**TU × TU**

1 53×46

2 83×28

3 67×36

4 79×57

Multiplication - written methods



5

Multiplication problems



All correct 2 stars
3 correct 1 star

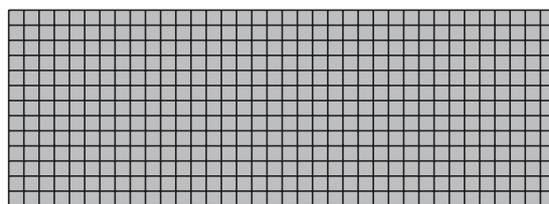
Write down the calculation you need to do, then work out the answer.

- 1 Work out the cost of four TV sets at £576 each.

- 2 A package holiday to the Costa del Sol costs £364 for one person for a week. How much will it cost for three people to go there for a week?

- 3 Mary is taking her three children on holiday. The cost for Mary is £450. The cost for each child is £235. Work out the total cost of the holiday.

- 4 Calculate how many tiles are needed to cover this floor:



37 tiles

86 tiles

Division - written methods

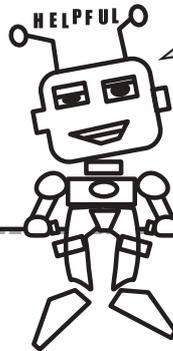
1 Sensible answers to mental problems



Example

8 cakes fit into a cake box.
 Mel has 19 cakes.
 How many cake boxes will Mel need?

 There are two 8s in 19 and three over,
 so Mel will need three boxes.



You need a box for the remainder.

Work out each answer in your head:

- 1 An egg box holds 6 eggs.
 Stella collected 26 eggs.
 How many egg boxes are needed to take all the eggs?
- 2 An egg box holds 6 eggs.
 Carl collected 58 eggs.
 How many egg boxes does Carl need for these eggs?
- 3 A taxi can take up to 5 people.
 Twenty-two people need to be taken to the station.
- 4 There are 7 players in a basketball team.
 Thirty children want to play basketball.
 How many complete teams can be made?
- 5 A box holds 10 ping-pong balls.
 I have 72 ping-pong balls.
 How many boxes can I fill?

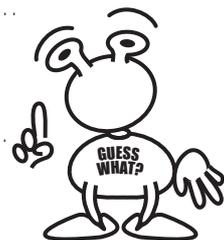
2 Review of division



- 1 $147 \div 5$ 2 $214 \div 8$ 3 $473 \div 9$

Chunking method?
 Standard written method?
 You decide.

- 4 Share 97 sweets among 7 children.
- 5 How many 9s are there in 376?
- 6 Ellen bought 6 pairs of jeans.
 They were all the same price. She paid £162.
 What did one pair of jeans cost?
- 7 8 ping-pong balls are packed in one box.
 How many boxes could you fill with 300 ping-pong balls?
 How many would you have left over?



Division – written methods

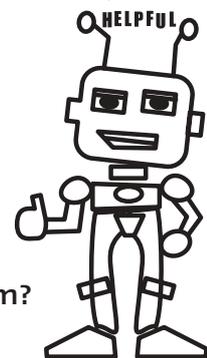
3

Problems



- 1 An egg tray holds 36 eggs.
Today our hens laid 276 eggs.
How many egg trays are needed to take all the eggs?
- 2 A return train ticket to London costs £39.80.
Dad has saved £250.
How many tickets to London could he buy?
- 3 193 pupils are going on a trip to Alton Towers.
A coach will take 53 pupils.
How many coaches will be needed?
- 4 266 children want to play basketball.
There are 7 players in a basketball team.
How many teams will there be, if all children are put in a team?
- 5 Seventeen children are going on a school ski trip.
The total cost for all seventeen children is £10 965.
Each child pays the same amount.
How much does each child pay?

In your head? On paper? With a calculator? You decide for each question.



STAR CHALLENGE

6

Mental challenges



Work out each answer in your head:

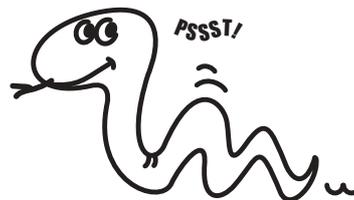
10–12 correct 1 star

- | | | | | | |
|---|------------------|---|------------------|---|-------------------|
| 1 | $£4.80 \div 2 =$ | 4 | $£9.20 \div 2 =$ | 7 | $£1.23 \div 3 =$ |
| 2 | $£8.20 \div 4 =$ | 5 | $£4.40 \div 4 =$ | 8 | $£10.50 \div 2 =$ |
| 3 | $£6.30 \div 3 =$ | 6 | $£0.72 \div 3 =$ | | |
- 9 4 packets of sugar cost £1.24.
What is the cost of one packet of sugar?
 - 10 The cost for 3 children to go skating is £8.70.
What is the cost for one child?
 - 11 Share £26 equally among four children.
 - 12 Four birthday cakes cost £30.
What is the cost of one birthday cake?

Division – written methods**Choose the method**

All correct 1 star

In your head? On paper?
With a calculator? You decide
for each question.



- 1 Peter goes to the fairground.
His favourite ride is *The Demon's Ride* at £2.35 each trip.
He has saved up £11.85.
How many goes could he have on *The Demon's Ride*?
- 2 Femi's uncle owns *The Demon's Ride*.
He lets Femi have six rides for £7.50.
How much is that for one ride?
- 3 Uncle Billy is a guard on the railway.
Last week he travelled from London to Holyhead and back four times.
He worked out that he had travelled 2144 miles altogether.
Calculate the distance from London to Holyhead.
- 4 Mayur is saving up to take his family to Paris for a special celebration.
It will cost £278 for each person.
He has saved £1750.
How many of the family can he take to Paris for this amount?
- 5 Jenny makes cakes for parties.
She has made 270 cakes.
16 cakes go in each cake box.
How many cake boxes will she need?

UNIT 15

SECTION 5: BRACKETS

DIRECT TEACHING POINTS

- Teach the use of brackets to show the order of operations in calculations.

Work out $3 + (4 \times 2)$

$$(4 \times 2) = 8$$

$$3 + 8 = 11, \text{ so } 3 + (4 \times 2) = 11$$

Always work out the
brackets first,

$(a - 3) \times 2 = 14$. What is a ?

$$7 \times 2 = 14,$$

$$10 - 3 = 7,$$

$$\text{so } a = 10.$$

- Exercise 1 provides essential practice. Exercise 2 and Star Challenge 2 are more difficult.
- In Star Challenge 1, discuss what is an appropriate method of calculation – mental, written or calculator.



bracket order of operations

Brackets

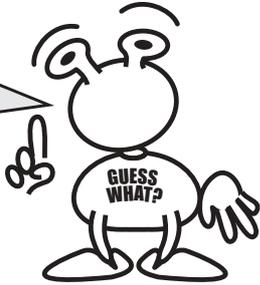
1 Using brackets



Example

Work out $3 + (4 \times 2)$
 $(4 \times 2) = 8$
 $3 + 8 = 11$, so $3 + (4 \times 2) = 11$

Always work out the brackets first.



Work out the value of each expression in your head:

- | | | |
|---|---|--|
| 1 $2 + (3 \times 10) = \dots\dots\dots$ | 4 $(2 \times 3) + 10 = \dots\dots\dots$ | 7 $4 + (20 \div 4) = \dots\dots\dots$ |
| 2 $(2 + 3) \times 10 = \dots\dots\dots$ | 5 $(5 \times 4) - 2 = \dots\dots\dots$ | 8 $(4 + 20) \div 4 = \dots\dots\dots$ |
| 3 $2 \times (3 + 10) = \dots\dots\dots$ | 6 $5 \times (4 - 2) = \dots\dots\dots$ | 9 $(100 \div 50) \times 2 = \dots\dots\dots$ |

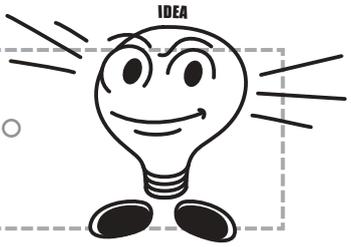
2 Brackets and letters



Example

$(a - 3) \times 2 = 14$. What is a ?

$7 \times 2 = 14$,
 $10 - 3 = 7$,
 so $a = 10$.



Work out the value of each letter.

- | | | |
|----------------------------|----------------------------|----------------------------|
| 1 $(3 \times 10) + b = 35$ | 4 $(e + 1) \div 2 = 3$ | 7 $6 + (h \div 3) = 13$ |
| $b = \dots\dots\dots$ | $e = \dots\dots\dots$ | $h = \dots\dots\dots$ |
| 2 $3 \times (10 + c) = 36$ | 5 $(f \times 3) - 10 = 11$ | 8 $(5 + i) \times 5 = 100$ |
| $c = \dots\dots\dots$ | $f = \dots\dots\dots$ | $i = \dots\dots\dots$ |
| 3 $(25 \div d) + 3 = 8$ | 6 $g \times (15 - 4) = 55$ | 9 $(100 \div j) + 25 = 75$ |
| $d = \dots\dots\dots$ | $g = \dots\dots\dots$ | $j = \dots\dots\dots$ |

Brackets



8

What's my sign?



9-10 correct 2 stars

7-8 correct 1 star

Complete each sentence.

Fill in each with +, -, × or ÷ to make a true number sentence:

$$1 \quad 423 \quad \square \quad 3 \quad = \quad 1269$$

$$2 \quad 858 \quad \square \quad 6 \quad = \quad 143$$

$$3 \quad 143 \quad \square \quad 159 \quad = \quad 302$$

$$4 \quad (240 \quad \square \quad 3) \quad - \quad 20 \quad = \quad 60$$

$$5 \quad 47 \quad \square \quad (5 \quad - \quad 2) \quad = \quad 141$$

$$6 \quad (141 \quad \square \quad 1) \quad \square \quad 10 \quad = \quad 130$$

$$7 \quad (75 \quad \square \quad 23) \quad \square \quad 18 \quad = \quad 70$$

$$8 \quad (17 \quad \square \quad 5) \quad \square \quad 10 \quad = \quad 75$$

$$9 \quad (2 \quad \square \quad 11) \quad \square \quad 2 \quad = \quad 20$$

$$10 \quad (500 \quad \square \quad 5) \quad \square \quad 5 \quad = \quad 95$$

UNIT 15

SECTION 6: MONEY AND 'REAL LIFE' PROBLEMS

DIRECT TEACHING POINTS

- Make sure that pupils attempt a set of mixed questions. This forces them to decide firstly on the calculation needed, and secondly on the appropriate means of calculation – mental, written or calculator. You need to discuss these choices.
- The exercises provide problems for pupils to attempt.



money cost amount change

Money and 'real life' problems

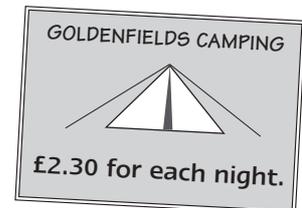
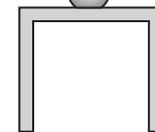
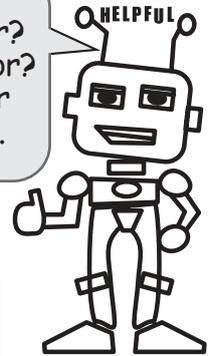
1

In the real world

Write down the calculation you need to do.
Work out the answer.

- 1 Stan had £3.49 in his pocket.
His lunch cost £1.72.
How much did Stan have left?
- 2 Caris has a table which is 87 cm high.
She puts a table lamp on top.
The lamp is 45 cm tall.
How high is the top of the lamp from the floor?
- 3 How much does it cost to camp at Goldenfields for three nights?
- 4 Sam camps for four nights.
How much change does Sam get from £10?
- 5 Rashid, Earl and Jenny go to a football match.
The cost for each of them is £9.50.
What is the total cost for all three of them?
- 6 John is sponsored for £4 each lap.
He does 23 laps.
How much money does he raise?
- 7 Ann is sponsored for £6.20 each lap.
She does 8 laps. How much money does she raise?
- 8 Frank is sponsored for £12.25 each lap.
He does 17 laps. How much money does he raise?
- 9 Emma wants to raise £100.
She is sponsored for £7.50 for each lap.
What is the least number of whole laps she must do?
- 10 Shirin, Adi and Mona go on holiday together.
The total cost of the holiday is £1683.27.
They all pay the same amount.
What is the cost for one of them?

In your head? On paper?
With a calculator?
You decide for each question.



**Money and 'real life'
problems****Money problems**

7-8 correct 2 stars
5-6 correct 1 star

Write down the calculation or calculations you need to do.
Work out the answer:

- 1 Amy buys four bags of crisps.
She gives the shopkeeper a £2 coin.
She gets 80p change.
What is the cost of one bag of crisps?
- 2 Dave wins £15 000 on the Lottery.
Dave gives half of the money to his mother.
He spends £3850 on a car.
How much does he have left?
- 3 Simon's aunts give him money for his birthday.
The amounts he is given are £5, £6.50, £7.75 and £12.50.
What is the total amount he is given?
- 4 Simon's grandmother says she will give him four times the amount he has in his Savings Account.
Simon has £23.64 in his account.
How much will his grandmother give him?
- 5 Seth goes to the fairground.
His favourite ride is the *Switchback of Fear*.
It costs £1.40 to go on this ride.
Seth has £8.90 left.
How many times could he go on the *Switchback of Fear* with this money?
- 6 Kris pays £2.95 to go swimming.
He went swimming four times this week.
He also bought £1.60 worth of sweets.
What was the total cost?
- 7 On Saturday, Cerys bought three CDs.
Each CD cost £12.50.
She paid £2.80 in bus fares.
At the start of the day she had £45.
How much did she have left after paying for the CDs and the bus fares?
- 8 Hassan divided £37.50 into five equal parts.
Hassan had two of these parts.
Adi had the rest.
How much did Adi get?

Money and 'real life' problems

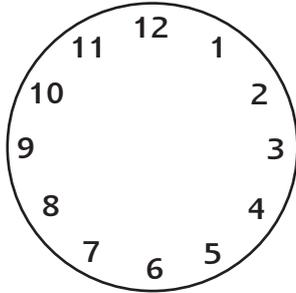
STAR CHALLENGE

10

Clock sums

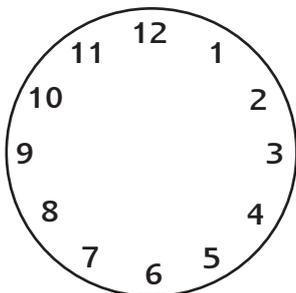
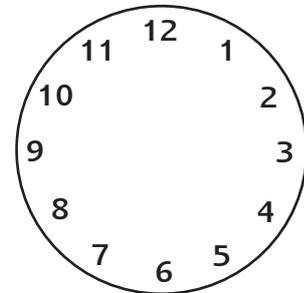


All correct 2 stars
3 correct 1 star



- 1 Work out the sum of the numbers on this clock face.
- 2 Cut the clock face into TWO parts, so that the sum of the figures on each part is the same.

- 3 Cut the clock face into THREE parts, so that the sum of the figures on each part is the same.



- 4 Cut the clock face into SIX parts, so that the sum of the figures on each part is the same.

STAR CHALLENGE

11

Every which way you turn



11 correct 2 stars
9-10 correct 1 star

Find the missing digits that make all of these correct:

$$\begin{array}{r}
 \boxed{4} \boxed{0} \boxed{0} \\
 \hline
 \boxed{} \boxed{}
 \end{array}
 -
 \begin{array}{r}
 \boxed{4} \boxed{9} \\
 \hline
 \boxed{} \boxed{}
 \end{array}
 =
 \begin{array}{r}
 \boxed{} \boxed{} \boxed{} \\
 \hline
 \boxed{} \boxed{}
 \end{array}$$

$$\begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{1} \boxed{6}
 \end{array}
 \div
 \begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{1} \boxed{6}
 \end{array}
 =
 \begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{} \boxed{}
 \end{array}$$

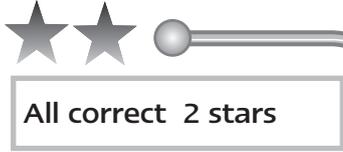
$$\begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{1} \boxed{6}
 \end{array}
 \times
 \begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{6} \boxed{}
 \end{array}
 =
 \begin{array}{r}
 \boxed{} \boxed{7} \boxed{5} \\
 \hline
 \boxed{} \boxed{}
 \end{array}$$

$$\begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{1} \boxed{6}
 \end{array}
 +
 \begin{array}{r}
 \boxed{6} \boxed{} \\
 \hline
 \boxed{} \boxed{}
 \end{array}
 =
 \begin{array}{r}
 \boxed{} \boxed{} \\
 \hline
 \boxed{} \boxed{}
 \end{array}$$

Money and 'real life' problems



Number jigsaw



You will need *centimetre squared paper*.

Here are eight jigsaw pieces:

7	4
3	2

7	3
2	4

5	4
9	7

7	6
8	5

8	6
6	2

3	9
1	6

1	5
9	2

1	6
5	4

Copy the jigsaw pieces onto centimetre squared paper. Cut them out.
Place the pieces in the table.

The numbers in each row must add up to total on the right of the row,
and the numbers in each column must add up to the total at the bottom.

								39
								37
								43
								38
24	14	19	26	15	17	24	18	

Unit 15 Answers

15

Section 1

Mental calculations - multiplication

1 Using related number facts

1	320	7	323	13	350	19	342
2	960	8	285	14	1250	20	3400
3	1640	9	651	15	288	21	495
4	1260	10	638	16	165		
5	450	11	646	17	650		
6	320	12	333	18	117		

2 Using simple factors

1	72	3	108	5	12
2	120	4	6	6	15

3 Mental multiplication mixture

1	36	6	84	11	750	16	135
2	52	7	85	12	54	17	288
3	125	8	360	13	135	18	192
4	130	9	418	14	861		
5	3600	10	4600	15	252		

Section 2

Mental calculations - division

1 Sharing problems

1	$2\frac{1}{2}$	2	$2\frac{1}{4}$	3	$3\frac{1}{3}$	4	$3\frac{2}{3}$	5	$1\frac{3}{4}$
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2 Dividing whole numbers with fraction answers

1	$2\frac{1}{2}$	4	$3\frac{1}{4}$	7	$1\frac{3}{4}$	10	$3\frac{2}{5}$	13	$7\frac{1}{3}$
2	$4\frac{1}{2}$	5	$3\frac{1}{5}$	8	$4\frac{2}{3}$	11	$3\frac{2}{7}$	14	$2\frac{6}{7}$
3	$3\frac{1}{3}$	6	$10\frac{1}{2}$	9	$1\frac{3}{5}$	12	$2\frac{2}{9}$	15	$4\frac{4}{5}$

Unit 15 Answers

Mental calculations - division *continued*

3 Common equivalent fractions and decimals

1	0.5	4	0.1	7	0.2	10	2.5
2	0.25	5	0.3	8	0.4	11	1.75
3	0.75	6	0.7	9	0.8	12	3.8

4 Dividing whole numbers with decimal answers

1	2.25	4	4.6	7	3.5	10	1.7
2	6.5	5	4.25	8	6.25	11	3.75
3	2.2	6	2.3	9	2.75	12	3.6

Section 3

Multiplication -
written methods

1 TU × U

1	144	2	340	3	135	4	343
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2 HTU × U

1	1976	3	3760	5	1917	7	1344
2	1404	4	4824	6	5022	8	3195

3 TU × TU

1	2438	2	2324	3	2412	4	4503
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Section 4

Division - written methods

1 Sensible answers to mental problems

1	5	2	10	3	5	4	4	5	7
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2 Review of division

1	29 rem 2	3	52 rem 5	5	41	7	37; 4
2	26 rem 6	4	13 rem 6	6	£27		

Unit 15 Answers

Section 4

Division - written methods *continued*

3 Problems

- | | | | | | |
|---|---|---|----|---|------|
| 1 | 8 | 3 | 4 | 5 | £645 |
| 2 | 6 | 4 | 38 | | |

Section 5

Brackets

1 Using brackets

- | | | | | | |
|---|----|---|----|---|---|
| 1 | 32 | 4 | 16 | 7 | 9 |
| 2 | 50 | 5 | 18 | 8 | 6 |
| 3 | 26 | 6 | 10 | 9 | 4 |

2 Brackets and letters

- | | | | | | |
|---|---------|---|---------|---|----------|
| 1 | $b = 5$ | 4 | $e = 5$ | 7 | $h = 21$ |
| 2 | $c = 2$ | 5 | $f = 7$ | 8 | $i = 15$ |
| 3 | $d = 5$ | 6 | $g = 5$ | 9 | $j = 2$ |

Section 6

Money and 'real life' problems

1 In the real world

- | | | | |
|---|----------------------------|----|---|
| 1 | $£3.49 - £1.72 = £1.77$ | 6 | $£4 \times 23 = £92$ |
| 2 | $87 + 45 = 132 \text{ cm}$ | 7 | $£6.20 \times 8 = £49.60$ |
| 3 | $£2.30 \times 3 = £6.90$ | 8 | $£12.25 \times 17 = £208.25$ |
| 4 | $£10 - £9.20 = £0.80$ | 9 | $100 \div 7.50 = 13 \text{ rem } 2$
14 complete laps |
| 5 | $£9.50 \times 3 = £28.50$ | 10 | $£1683.27 \div 3 = £561.09$ |

Unit 15 Answers

Star Challenge answers



1

One-star mental challenge

14–15 correct 1 star

1	94	5	300	9	144	13	6800
2	92	6	133	10	750	14	60
3	225	7	248	11	30	15	375
4	1200	8	576	12	50		



2

Two-star mental challenge

All correct 2 stars
5–6 correct 1 star

1	£228	3	27	5	165	7	184
2	420	4	216	6	191		



3

Division challenges

11–12 correct 2 stars
8–10 correct 1 star

1	$5\frac{1}{2}$	4	$2\frac{1}{6}$	7	$1\frac{3}{8}$	10	2.1
2	$3\frac{3}{4}$	5	$2\frac{1}{7}$	8	$8\frac{1}{3}$	11	2.75
3	$1\frac{3}{10}$	6	$3\frac{7}{10}$	9	4.5	12	2.6



4

Problems

All correct 1 star

1	£37.50	2	£6.80	3	£5.25	4	£6.50	5	$1\frac{2}{3}$ tins
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5

Multiplication problems

All correct 2 stars
3 correct 1 star

1	(a) 4×576	(b) £2304	3	(a) $3 \times 235 + 450$	(b) £1155
2	(a) 3×364	(b) £1092	4	(a) 37×86	(b) 3182



6

Mental challenges

10–12 correct 1 star

1	£2.40	4	£4.60	7	£0.41	10	£2.90
2	£2.05	5	£1.10	8	£5.25	11	£6.50
3	£2.10	6	£0.24	9	31p	12	£7.50



7

Choose the method

All correct 1 star

1	5	2	£1.25	3	268 miles	4	6	5	17
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Unit 15 Answers

Star Challenge answers *continued*

8 What's my sign?

9-10 correct 2 stars
7-8 correct 1 star

$$\begin{array}{cccccc} 1 & \times & 3 & + & 5 & \times & 7 & - & + & 9 & \times & - \\ 2 & \div & 4 & \div & 6 & - & - & 8 & \times & - & 10 & \div & - \end{array}$$



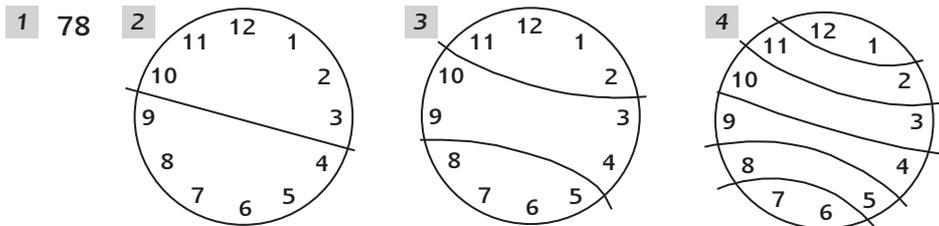
9 Money problems

7-8 correct 2 stars
5-6 correct 1 star

- 1 (a) £2 - 80p; £1.20 ÷ 4 or (£2 - 80p) ÷ 4 (b) 30p
 2 (a) 15 000 ÷ 2; 7500 - 3850 or (15 000 ÷ 2) - 3850 (b) £3650
 3 (a) 5 + 6.60 + 7.75 + 12.50 (b) £31.75
 4 (a) 23.64 × 4 (b) £94.56
 5 (a) 8.90 ÷ 1.40 (b) 6
 6 (a) (4 × 2.95) + 1.60 (b) £13.40
 7 (a) 3 × 12.50; 37.50 + 2.80 = 40.30; or 45 - (3 × 12.50) - 2.80 (b) £4.70
 8 (a) 37.50 ÷ 5; 7.5 × 3 (b) £22.50



10 Clock sums

All correct 2 stars
3 correct 1 star

11 Every which way you turn

11 correct 2 stars
9-10 correct 1 star

$$\begin{array}{r} 400 \\ \div \\ 25 \\ \hline 16 \end{array} \times \begin{array}{r} 49 \\ + \\ 11 \\ \hline 60 \end{array} = \begin{array}{r} 351 \\ - \\ 275 \\ \hline 76 \end{array}$$



12 Number jigsaw

All correct 2 stars

7	4	3	9	1	6	5	4
3	2	1	6	5	4	9	7
8	6	7	6	7	3	1	5
6	2	8	5	2	4	9	2

