Answers

Unit 1 Number and Place Value

1A/B The number system and place value: Discover and Explore

	Millions	Hundred thou-sands	Ten thou-sands	Thou-sands	Hund-reds	Tens	Units	.	Tenths	Hund-redths
1			3	9	7	7	5	.	7	1
2	1	6	6	5	6	7	1	.		
3	5	6	2	5	4	2	9	.		
4	6	2	2	7	6	7	8	.		
5		4	1	5	1	5	1	.		
6							9	.	5	8

1C Number properties: Discover

1. 2 × 2 × 3 × 5

2. 2 × 2 × 7

3. 5 × 17

4. 2 × 2 × 13

5. 2 × 2 × 3 × 3

6. 2 × 2 × 2 × 3 × 3

7. 2 × 3 × 3 × 5

8. 2 × 2 × 2 × 2 × 2 × 2

9. 3 × 29

10. 2 × 5 × 5

1C Number properties: Explore

1. 60

2. 55

3. 48

4. 91

5. 114

6. 14

7. 24

8. 153

1D/E Comparing numbers and estimation and rounding: Discover – Accept all accurate answers.

1D/E Comparing numbers and estimation and rounding: Explore

1. **/ 2**.

Number	Rounded to the nearest 10	Rounded to the nearest 100
567	570	600
576	580	600

Number	Rounded to the nearest 10	Rounded to the nearest 100
657	660	700
675	680	700
756	760	800
765	770	800

3. Accept all correct comparisons.

1F Number sequences: Discover – Accept all accurate sequences and observations.

1F Number sequences: Explore – Accept all accurate answers.

1 Review – Accept all accurate answers. There should be 5 facts about each number.

Unit 2 Fractions and Decimals

2A Equivalent fractions: Discover

Fraction	Equivalent fractions
$\frac{2}{3}$	$\frac{4}{6}, \frac{6}{9}, \frac{8}{12}, \frac{10}{15}$
$\frac{3}{5}$	$\frac{6}{10}, \frac{9}{15}$
$\frac{5}{6}$	$\frac{10}{12}$
$\frac{1}{8}$	$\frac{2}{16}$
$\frac{4}{10}$	$\frac{2}{5}$
$\frac{2}{12}$	$\frac{1}{6}$
$\frac{10}{15}$	$\frac{2}{3}, \frac{4}{6}, \frac{6}{9}, \frac{8}{12}$
$\frac{12}{15}$	$\frac{4}{5}, \frac{8}{10}$

2A Equivalent fractions: Explore

1. $\frac{3}{4} = \frac{6}{8}$ so $\frac{3}{4} > \frac{3}{8}$

2. $\frac{2}{5} = \frac{4}{10}$ and $\frac{5}{10} = \frac{1}{2}$ so $\frac{2}{5} < \frac{1}{2}$

3. $\frac{3}{7} = \frac{6}{14}$ so $\frac{8}{14} > \frac{3}{7}$ but $\frac{8}{14} = \frac{4}{7}$ so $\frac{4}{7} > \frac{3}{7}$

4. Using fraction wall $\frac{9}{13} > \frac{4}{9}$

5. $\frac{5}{15} = \frac{10}{30}$ and $\frac{3}{6} = \frac{15}{30}$ so $\frac{5}{15} < \frac{3}{6}$ but $\frac{5}{15} = \frac{1}{3}$ and $\frac{3}{6} = \frac{1}{2}$ so $\frac{1}{3} < \frac{1}{2}$

6. $\frac{3}{8} = \frac{6}{16}$ so $\frac{8}{16} > \frac{3}{8}$ but $\frac{8}{16} = \frac{1}{2}$ so $\frac{1}{2} > \frac{3}{8}$

2B Fractions and decimals: Discover

1.

$\frac{1}{7}$	$\frac{2}{7}$	$\frac{3}{7}$	$\frac{4}{7}$	$\frac{5}{7}$	$\frac{6}{7}$	$\frac{7}{7}$
0.142857	0.2857142	0.4285714	0.5714285	0.7142857	0.8571428	1

2.

$\frac{1}{9}$	$\frac{2}{9}$	$\frac{3}{9}$	$\frac{4}{9}$	$\frac{5}{9}$	$\frac{6}{9}$	$\frac{7}{9}$	$\frac{8}{9}$	$\frac{9}{9}$
0.111111	0.222222	0.333333	0.444444	0.555555	0.66666	0.777777	0.888888	1

3.

$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$	$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$	$\frac{11}{12}$	$\frac{12}{12}$
0.0833	0.166	0.25	0.333	0.416	0.5	0.583	0.666	0.75	0.833	0.916	1

2B Fractions and decimals: Explore

A Accept all accurate answers. Ensure all numbers have two decimal places and are placed in order from smallest to largest.

B

Instruction	Start number					
count on in steps of 0.1	0.4	0.5	0.6	0.7	0.8	0.9
count on in steps of 0.2	0.1	0.3	0.5	0.7	0.9	1.1
count back in steps of $\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{1}{2}$ or $\frac{2}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$
count back in steps of $\frac{1}{2}$	$1\frac{1}{2}$	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	–1
count on in steps of 0.5	2	2.5	3	3.5	4	4.5

2C Addition pairs: Discover

Number	Addition pair to 100	Addition pair to 10	Addition pair to 1
38	38 + 62 = 100	3.8 + 6.2 = 10	0.38 + 0.62 = 1
85	85 + 15 = 100	8.5 + 1.5 = 10	0.85 + 0.15 = 1
41	41 + 59 = 100	4.1 + 5.9 = 10	0.41 + 0.59 = 1
16	16 + 84 = 100	1.6 + 8.4 = 10	0.16 + 0.84 = 1
73	73 + 27 = 100	7.3 + 2.7 = 10	0.73 + 0.27 = 1
24	24 + 76 = 100	2.4 + 7.6 = 10	0.24+ 0.76 = 1
11	11 + 89 = 100	1.1 + 8.9 = 10	0.11 + 0.89 = 1
89	89 + 11 = 100	8.9 + 1.1 = 10	0.89 + 0.11 = 1
54	54 + 46 = 100	5.4 + 4.6 = 10	0.54 + 0.46 = 1
67	67 + 33 = 100	6.7 + 3.3 = 10	0.67 + 0.33 = 1
14	14 + 86 = 100	1.4 + 8.6 = 10	0.14 + 0.86 = 1
51	51 + 49 = 100	5.1 + 4.9 = 10	0.51 + 0.49 = 1
40	40 + 60 = 100	4 + 6 = 10	0.4 + 0.6 = 1
5	5 + 95 = 100	0.5 + 9.5 = 10	0.05 + 0.95 = 1
92	92 + 8 = 100	9.2 + 0.8 = 1	0.92 + 0.08 = 1

2C Addition pairs: Explore – Accept all accurate answers.

2D Mixed numbers and improper fractions: Discover

1. a. $4\frac{1}{2}$
   b. $4\frac{1}{4}$
   c. $3\frac{1}{5}$
   d. $4\frac{3}{5}$
   e. $2\frac{1}{4}$
   f. $1\frac{5}{6}$
   g. $3\frac{1}{8}$
   h. $3\frac{1}{10}$
2. a. $\frac{13}{4}$
   b. $\frac{33}{8}$
   c. $\frac{35}{8}$
   d. $\frac{47}{9}$
   e. $\frac{19}{10}$
   f. $\frac{81}{8}$
   g. $\frac{34}{5}$
   h. $\frac{42}{11}$

2D Mixed numbers and improper fractions: Explore – Accept all accurate answers. Ensure fractions are within range and are expressed correctly as improper fractions and mixed numbers.

2E Ratio and proportion: Discover and Explore

1. a. 1:2
   b. 1:3
   c. 1:4
   d. 1:7
   e. 3:1
   f. 4:1

Check that arrays are drawn correctly.

2. a. $\frac{6}{10}$ 0.6 60%
   b. $\frac{9}{10}$ 0.9 90%
   c. $\frac{1}{10}$ 0.1 10%
   d. $\frac{5}{10}$ 0.5 50%
   e. $\frac{8}{10}$ 0.8 80%
3. a. 0.75 or 75% coloured tiles

   b. 0.125 or 12.5% coloured tiles

2F Percentages: Discover

1. a. $\frac{1}{4}$
   b. $\frac{3}{4}$
   c. $\frac{1}{10}$
   d. $\frac{4}{10}$ or $\frac{2}{5}$
   e. $\frac{2}{10}$ or $\frac{1}{5}$
   f. $\frac{9}{10}$
   g. $\frac{5}{10}$ or $\frac{1}{2}$
   h. $\frac{1}{3}$
   i. $\frac{2}{3}$
   j. $\frac{7}{10}$

Mark (out of 60)	Equivalent %
60	100%
54	90%
45	75%
42	70%
30	50%
24	40%

Mark (out of 60)	Equivalent %
15	25%
12	20%
6	10%
3	5%

2F Percentages: Explore – Accept all accurate answers. There should be 6 different percentages for each number.

2 Review

1. T Shirt $4 Jeans $12 Trainers $16 Socks $1

2. $1 I pay $9.

3. Yes, because 24 ÷ 3 = 8

4. $66 Discount = $22 I pay $44.

5. $32 Discount = $3.20 I pay $28.80.

Unit 3 Mental Calculation

3A/F Mental strategies for addition and subtraction: Discover – Accept all effective strategies.

3A/F Mental strategies for addition and subtraction: Explore – Accept all accurate questions.

3B/E Mental strategies for multiplication and division: Discover – Accept all accurate calculations.

3B/E Mental strategies for multiplication and division: Explore

1.

x	20	40	30	60	90
5	100	200	150	300	450
60	1200	2400	1800	3600	5400
70	1400	2800	2100	4200	6300
10	200	400	300	600	900
50	1000	2000	1500	3000	4500

2.

x	20	40	30	60	90
9	180	360	270	540	810
61	1220	2440	1830	3660	5490
69	1380	2760	2070	4140	6210
11	220	440	330	660	990
49	980	1960	1470	2940	4410

3.

x	16	25	50	30	60
0.4	6.4	10	20	12	24
0.8	12.8	20	40	24	48
0.2	3.2	5	10	6	12
0.5	8	12.5	25	15	30
0.3	4.8	7.5	15	9	18

3C Using known facts to derive new ones: Discover

1. a. 13
b. 26
c. 39
d. 52
e. 65
f. 78
g. 91
h. 104
i. 117
j. 130

(Check reasons are accurate.)

2. a. 19
b. 38
c. 57
d. 76
e. 95
f. 114
g. 133
h. 152
i. 171
j. 190

(Check reasons are accurate.)

3C Using known facts to derive new ones: Explore – Accept all accurate answers.

3D Doubling and halving: Discover – Accept all accurate answers.

3D Doubling and halving: Explore

1. 8 bananas = $3.00
I mango = $0.40
3 tomatoes = $1.05
I pack grapes = $0.62
Total cost = $5.07

2. 2 bananas = $0.75
2 mangos = $0.80
6 tomatoes = $2.10
4 packs grapes = $2.48
Total cost = $6.13

3. 4 bananas = $1.50
4 mangos = $1.60
3 tomatoes = $1.05
4 packs grapes = $2.48
Total cost = $6.63

3 Review – Accept all accurate answers.

Unit 4 Addition and Subtraction

4A Adding and subtracting 3-digit numbers: Discover

175.6 + 28.3 = 203.9
398 + 46 = 444
119.7 – 18.4 = 101.3
965.2 + 425.8 = 1391
210 + 698 = 908
478.6 – 139.8 = 338.8
156 + 999 = 1155
98.6 – 44.5 = 54.1
99.6 – 89.9 = 9.7
56.88 + 98.75 = 155.63

4A Adding and subtracting 3-digit numbers: Explore – Accept all accurate answers.

4B Adding and subtracting money: Discover and Explore

Ensure that working is shown in all the answers.

1. $48.34

2. Yes – we have $23.55

3. $28.81

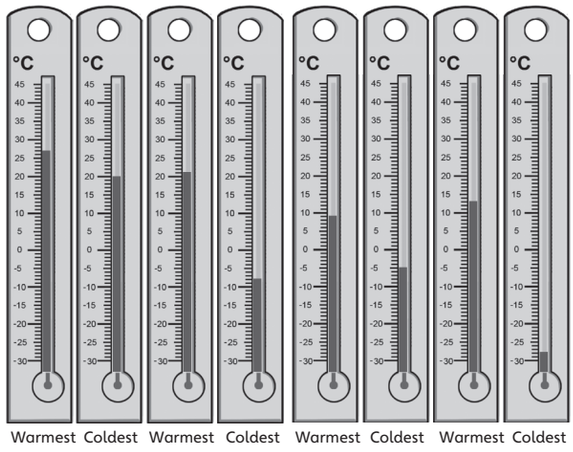
4. $4.34

5. $20.55

6. Raise a total of $138.74. Head pays $11.26.

4C Using negative numbers: Discover and Explore

1. Bangkok Moscow Reykjavik North Pole



2. a. 7
b. 29
c. 14
d. 41
e. 35
f. 49
g. 11
h. 28

4 Review

1. 2.04 m

2. 1.49 m

3. 5.31 m

4. 2.19 m

5. Accept all accurate answers.

6. –22 and +8

7. –5 and +17

8. –3

Unit 5 Multiplication and Division

5A Multiplying by 2-, 3- and 4-digit numbers: Discover and Explore

Ensure that the working is shown.

1. a. 400 × 4 + 80 × 4 + 6 × 4 = 1600 + 320 + 24 = 1944

b. 500 × 6 + 30 × 6 + 2 × 6 = 3000 + 180 + 12 = 3192

c. 800 × 3 + 10 × 3 + 5 × 3 = 2400 + 30 + 15 = 2445

d. 200 × 9 + 60 × 9 + 8 × 9 = 1800 + 540 + 72 = 2412

e. 300 × 5 + 80 × 5 + 1 × 5 = 1500 + 400 + 5 = 1905

f. 600 × 7 + 50 × 7 + 9 × 7 = 4200 + 350 + 63 = 4613

2. a. 9984

b. 13 886

c. 23 328

d. 10 536

3. a. 13 708

b. 8505

c. 22 854

d. 15 466

5B Dividing 3-digit numbers by 2-digit numbers: Discover

Ensure all working is shown.

1. 32

2. 63

3. 58

4. 38

5B Dividing 3-digit numbers by 2-digit numbers: Explore

Ensure working is shown.

1. 819 ÷ 21

2. 884 ÷ 17

3. 945 ÷ 15

4. 923 ÷ 13

5C Division with remainders: Discover

1.	$7\frac{6}{10}$	7.6
2.	$78\frac{1}{2}$	78.5
3.	$14\frac{1}{3}$	14.333
4.	$10\frac{3}{8}$	10.375
5.	$11\frac{1}{2}$	11.5
6.	$25\frac{3}{5}$	25.6
7.	$5\frac{6}{10}$	5.6
8.	$65\frac{2}{5}$	65.4
9.	$12\frac{3}{8}$	12.375
10.	$29\frac{1}{4}$	29.25

5C Division with remainders: Explore

1. 90 cents

2. 90 cents

3. To the nearest 10 cents they cost the same.

4. $1.17

5. $1.30

5D Using the arithmetical laws for multiplication and division: Discover

Order used in calculation should be shown.

1. 1700

2. 2600

3. 1260

4. 900

5. 1600

6. 380

7. 8400

8. 1900

9. 240

10. 2900

11. 3800

12. 840

5D Using the arithmetical laws for multiplication and division: Explore

Working should be shown.

1. 222

2. 430

3. 174

4. 252

5. 328

6. 693

7. 252

8. 208

9. 296

10. 322

11. 296

12. 492

5 Review

1. $110.50

2. $218.40

3. $13.00

4. $25.65

Unit 6 Shapes and Geometry

6A Classifying polygons: Discover and Explore – Accept all accurate answers. There should be 5 sketches and names of polygons and 2 properties for each polygon.

6B Properties of 3D shapes: Discover and Explore – Accept all accurate answers. There should be 6 polyhedra with the numbers of faces, vertices and edges given for each.

6C/D Making 2D representations of 3D shapes and angles in a triangle: Discover – Accept all accurate answers. There should be drawings of two 3D shapes. The plan, front elevation and side elevation should be drawn for each shape.

6C/D Making 2D representations of 3D shapes and angles in a triangle: Explore – Accept all accurate answers. Ensure the angles are labelled correctly as Acute, Obtuse or Right-angled.

6 Review: Other properties may be possible.

Shape	2D or 3D	Property 1	Property 2	Property 3
scalene triangle	2D	3 different lengths	3 different angles	3-sided shape
regular heptagon	2D	7-sided	7 sides equal lengths	7 equal angles
hemisphere	3D	1 edge	2 faces	0 vertices
tetrahedron	3D	4 faces	6 edges	4 vertices
rhombus	2D	4 equal sides	opposite sides parallel	2 lines of symmetry
dodecahedron	3D	12 faces	30 edges	20 vertices
octahedron	3D	8 faces	12 edges	6 vertices
kite	2D	4 sides	1 line of symmetry	no parallel sides
right-angled triangle	2D	3 sides	1 right angle	
parallelogram	2D	4 sides	opposite sides parallel	opposite angles equal
triangular prism	3D	5 faces	6 vertices	9 edges
regular hexagon	2D	6 sides	6 equal angles	all sides equal in length

Unit 7 Position and Movement

7A Reading and plotting coordinates: Discover – Accept all accurate answers. Ensure the coordinates show the correct location.

7A Reading and plotting coordinates: Explore – Accept all accurate answers.

7B Reflections and rotations: Discover – Accept all accurate answers.

7B Reflections and rotations: Explore – Accept all accurate answers.

7 Review – Accept all accurate answers. There should be 5 sentences including the words reflection, rotation and translation and some coordinates should be given.

Unit 8 Length, Mass and Capacity

8A Selecting and using appropriate units of measure: Discover and Explore

Object	Measurement in metric units	Conversion to imperial units
height of Shanghai Tower	632 m	693 yards
length of monitor lizard	160 cm	64 inches
mass of an elephant	2300 kg	5050 pounds
capacity of a large drinking glass	450 ml	0.8 l pint
mass of the heaviest human being	635 kg	1397 pounds

Object	Measurement in metric units	Conversion to imperial units
length of the River Nile	4189 km	2612.5 miles
capacity of a can of fizzy drink	330 ml	0.594 pints
mass of a small cat	2.9 kg	6.38 pounds
distance from London to Dubai	5500 km	3438 miles
height of the smallest adult	55 cm	22 inches

8B Converting units of measure: Discover

1 km = 1000 m

1 m = 100 cm

1 cm = 10 mm

1 l = 100 cl

1 l = 1000 ml

1 cl = 10 ml

1 kg = 1000 g

1 g = 1000 mg

2. a. 8700 m

b. 875 cm

c. 895 mm

d. 555 cl and 5550 ml

e. 84.5 ml

f. 8950 g

g. 9650 mg

h. 5.5 km

i. 9.85 l

j. 6.75 kg

8B Converting units of measure: Explore

1. Accept all sensible answers – this is 1000 km.

2. This is just less than 2 years.

3. 50 grams

4. Check the calculation – number of breaths in a minute × 60 × 24 × 7 × 500 (in ml).

8C Using scales and measuring accurately: Discover and Explore –

Accept all accurate answers.

8 Review

1. 9.9 litres

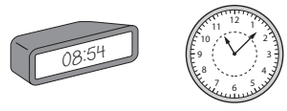
2. 15.5 kg

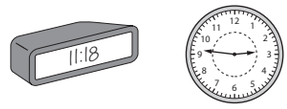
3. 2.5 kg

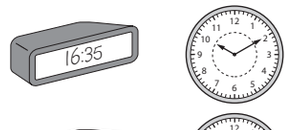
4. Total weight = 5 kg so cost is $15

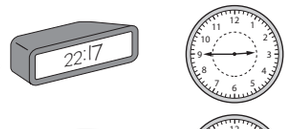
Unit 9 Time

9A Converting between units of time: Discover

1. 

2. 

3. 

4. 

5. 

End times are:

1. 11:07

2. 14:46

3. 22:10

4. 02:45

5. 07:34

9A Converting between units of time: Explore

1. This will depend on when the questions were answered – Accept all accurate answers.

2. 40 years = 2080 weeks

3. Again this will depend on when the question is answered. Currently 2015 – 830 = 1185 years = 118 decades if we round down.

4. 1 000 000 days is 2799.726 years. So it will be the year 4814! It is about 265 days into the year so it will be about 23 September.

5. If you are at school for 7 hours this is 28 800 000 milliseconds

9B Using the 24-hour clock and timetables: Discover – Accept all sensible answers for the ideal timetable for a week including the 5 facts about the timetable.

9B Using the 24-hour clock and timetables: Explore – Accept all sensible answers for the flight timetable using the 24-hour clock.

9C Calculating time intervals including time zones: Discover

1. 15:25

2. 13:30

3. 19:45

4. 14:15

5. 22:25

6. 17:30

7. 21:00

8. 02:00

9C Calculating time intervals including time zones: Explore

1. 03:45 local time

2. 15:40 – 17:40 local time

3. 19:55 – 00:55 local time

4. 19:00 – 18:00 local time

5. 22:35 – 01:35 local time

6. 02:40 – 06:40 local time

7. 12:10 – 02:10 local time

8. 15:55 – 03:55 local time

9. 05:05 – 02:05 local time

9 Review

1. 15:20

2. 20:30

3. 20:14

4. 3600 in an hour; 86 400 in day; 604 800 in a week

Unit 10 Area and Perimeter

10A Area and perimeter of rectilinear shapes: Discover – Accept all accurate answers with an area of 40 square metres.

10A Area and perimeter of rectilinear shapes: Explore – Accept all accurate answers.

10B Estimating areas of irregular shapes by counting squares: Discover – Accept all accurate answers.

10B Estimating areas of irregular shapes by counting squares: Explore – Accept all accurate answers.

10C Calculating areas and perimeters of compound shapes: Discover

A: Perimeter 18 cm Area 15 cm^2

B: Perimeter 26 cm Area 19 cm^2

C: Perimeter 24 cm Area 20 cm^2

D: Perimeter 34 cm Area 36 cm^2

10C Calculating areas and perimeters of compound shapes: Explore – Accept all accurate answers for the net, the surface area and the perimeter.

10 Review – Accept all accurate answers.

Unit 11 Handling Data

11A Handling data: Discover and Explore – Accept all sensible and accurate answers for monthly temperatures in the three countries. Three facts need to be given including a range and mode.

11B Probability: Discover and Explore

Chosen outcome	Equally likely outcomes	Number of possible required outcomes	Probability fraction
picking a Jack, Queen or King from a pack of cards	52 (number of cards)	12 picture cards	$\frac{12}{52} = \frac{3}{13}$
rolling an odd number on a dice	6	3	$\frac{3}{6} = \frac{1}{2}$
rolling a total of 9 on two dice	36 possible scores	4 (3,6; 6,3; 4,5; 5,4)	$\frac{4}{36} = \frac{1}{9}$
rolling an even number on a 10-sided dice	10	5	$\frac{5}{10} = \frac{1}{2}$