



# Unit 1 – Numbers to 100

## I Numbers to 20

→ pages 8–11

### Discover

- The mystery number cannot be 15. It cannot be any number less than 15. It could be any of 16, 17, 18, 19 or 20.
  - 15 counters placed on two ten frames. Suggested arrangement is one ten frame complete with 10 counters, the second with 5 counters, but other arrangements would be acceptable.

### Think together

- Missing numbers: 3, 13, 19
- 13
  - 19
  - 20
- |       |       |
|-------|-------|
| a) 12 | d) 18 |
| b) 14 | e) 7  |
| c) 13 | f) 6  |
| g) 10 |       |

h) Children could have written any number bonds to 19, e.g. 10, 9; 11, 8; 12, 7; 13, 6; 14, 5; 15, 4; 16, 3; 17, 2; 18, 1

## 2 Count in 10s

→ pages 12–15

### Discover

- 30
  - 40

### Think together

- 50
  - 60
- 30, 40, 60, 80, 90
- 10 is 1 ten, 20 is 2 tens, 30 is 3 tens, 40 is 4 tens, 50 is 5 tens.
  - 70, 90, 100 is 10 tens.

## 3 Count in 10s and 1s

→ pages 16–19

### Discover

- There are 40 stacked cones.
  - There are 43 cones altogether,  $40 + 3$ .

### Think together

- 32
  - Jo is not correct. There are 26 seashells.  
Jim is not correct. There are 26 seashells.
- 46 pencils; 58 pens; 42 rubbers

## 4 Recognise 10s and 1s

→ pages 20–23

### Discover

- 23
  - 23

### Think together

- 34; Children count 10, 20, 30, 31, 32, 33, 34.
- 64
  - 52
- a), b) and c) are the same in that they all have 4 tens and 2 ones. They are different in that a) is shown in ten frames and b) and c) using interlocking cubes. The cubes in b) and c) are oriented differently.

## 5 Build a number from 10s and 1s

→ pages 24–27

### Discover

- Danny can use five 10s (five rods).
  - Maya can use five 10s and two 1s.

### Think together

- They represent 70, using seven 10s.
  - They represent 72, using seven 10s and two 1s.
- Children explain how they would change their representations of 40 to make 41, then 42, 43, 44 and 45 (by adding 1s).
- 64
  - 87

## 6 Use a place value grid

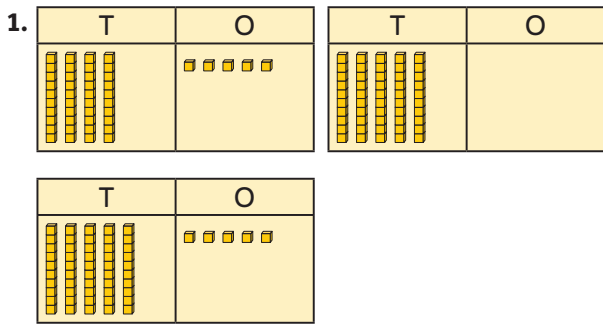
→ pages 28–31

### Discover

- Mr Taylor's number is 32.
  - The value of the 3 is three 10s and the value of the 2 is two 1s.



**Think together**



The 5 in 45 stands for five 1s; the 5 in 50 stands for five 10s and the 5s in 55 stand for five 10s and five 1s.

2. a) 41  
b) 65  
c) 30
3. Children could make these other numbers: 2, 5, 25, 50, 52.

## 7 Partition numbers to 100

→ pages 32–35

**Discover**

1. a) 56 is made up of 5 tens and 6 ones.  
b) The numbers 50 and 6 go in the part-whole model.

**Think together**

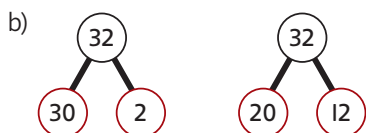
- 1 The numbers 30 and 5 go in the part-whole model.
2. a) 71  
b) 44
3. a) The 4 in the bottom left red circle should be 40.  
b) The numbers are correct but it would be better if the 8 and 50 in the bottom red circles were switched over.  
c) Correct.  
d) 26 should be in the black circle, and 20 in the top red circle.

## 8 Partition numbers flexibly within 100

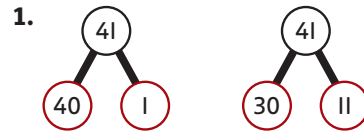
→ pages 36–39

**Discover**

1. a) Izzy has made 32. Kasim has made 32.  
Same: They both have the same total number of counters.  
Different: Izzy has partitioned 32 into 30 and 2 whilst Kasim has partitioned 32 into 20 and 12.



**Think together**



2. The missing numbers are 7 and 17.
3. 75 can be partitioned follows: 70 and 5; 60 and 15; 50 and 25; 40 and 35; 30 and 45; 20 and 55; 10 and 65.

## 9 Write numbers to 100 in expanded form

→ pages 40–43

**Discover**

1. a) triangle = 5; circle = 50  
b) star = 28

**Think together**

1. a) 15  
b) 3  
c) 20
2. a)  $46 = 40 + 6$   
b)  $53 = 50 + 3$   
c)  $61 = 60 + 1$   
d)  $70 + 3 = 73$
3.  $52 = 50 + 2$   
 $52 = 40 + 12$   
 $52 = 30 + 22$   
 $52 = 20 + 32$

## 10 10s on a number line to 100

→ pages 44–47

**Discover**

1. a) No, as Myra's number line goes up in 1s.  
b) Her number line could go up in 10s instead.

**Think together**

1. A = 20, B = 40, C = 60
- 2.
3. a) One number line goes up in 1s to 10, the other goes up in 10s to 100.  
b) Same: It goes up in 10s to 100.  
Different: It is vertical instead of horizontal.



## 11 10s and 1s on a number line to 100

→ pages 48–51

### Discover

- Asha's goes up in 10s. Filip's goes up in 10s and 1s. They both go from 0 to 100 and they are both horizontal.
  - The 4th mark after 30 shows 34.

### Think together

- Children say 73, 74, 75, 76, 77, 78, 79.
- 59
- Children should point to 42, 65 and 89.

## 12 Estimate numbers on a number line

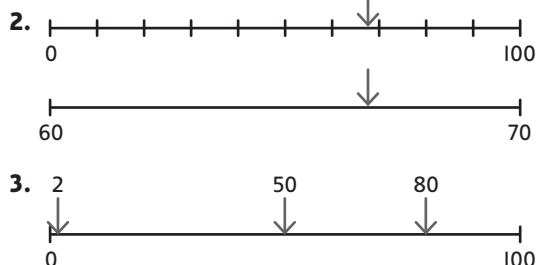
→ pages 52–55

### Discover

- Yes, the teacher is correct. The arrow is pointing to 20.
  - 82 lies between 80 and 90. It is less than half-way between 80 and 90, closer to 80.

### Think together

- 10, 50, 85



## 13 Compare numbers (I)

→ pages 56–59

### Discover

- Matt has 43 cookies. Anna has 50 cookies.
  - Matt has fewest cookies.

### Think together

- 30 is less than 43.
  - 43 is equal to 43.
- Ros has more cubes than Tim.
- Mo has 70 straws, Jan has 40 straws.
  - Children point to 40 and 70 on the number line.
  - Jan has fewer straws than Mo. Mo has more straws than Jan.

## 14 Compare numbers (2)

→ pages 60–63

### Discover

- Beth has more leaves than Asif.
  - $43 < 57$

### Think together

- 75 is greater.
  - $54 < 75$
- 62 is smaller.
- $64 > 26$
  - $57 < 70$
  - $57 > 54$

## 15 Order numbers

→ pages 64–67

### Discover

- Eva's sunflower is tallest (plant C).
  - Dan's sunflower is shortest (plant A).

### Think together

- $67 > 63 > 31$   
 $31 < 63 < 67$
- Children choose suitable numbers, for example,  
 $30 < 35 < 40$   
 $65 > 58 > 55$   
 $100 > 70 > 50 > 0$
- Multiple possible answers between 11 and 79.

## 16 Count in 2s, 5s and 10s

→ pages 68–71

### Discover

- There are 12 children on the bus – children count in 2s: 2, 4, 6, 8, 10, 12
  - There will be 60 fingers in total – children count in 10s: 10, 20, 30, 40, 50, 60

### Think together

- Children count in 5s: 25, 30, 35, 40, 45, 50
  - Children count in 10s: 30, 40, 50
  - Children count in 2s: 8, 10, 12, 14, 16, 18, 20 ...  
46, 48, 50
- 34, 36, **38**, 40, **42**, **44**, **46**
  - 45, 50, 55, **60**, **65**, **70**
  - 100, 90, **80**, 70, **60**, **50**
- 68**, 70, **72**
  - 76**, 78, **80**
  - 65**, 70, **75**
  - 80**, 90, **100**



## 17 Count in 3s

→ pages 72–75

### Discover

- a) Andy used 18 sticks.  
b) Andy needs 12 more sticks.

### Think together

- a) The missing numbers are 3, 6, 9, 12. There are 12 trees.  
b) The missing numbers are 3, 6, 9, 12, 15. There are 15 birds.
- The missing numbers are 15, 18, 21, 24. Steve used 24 blocks altogether.
- Jake's counting: 2, 4, 6, 8, 10, 12, 14.  
Zara's counting: 3, 6, 9, 12, 15, 18, 21.  
Jake and Zara both write 6 and 12.  
Common multiples beyond these will all be multiples of 6, e.g. 18, 24 and 30.

## End of unit check

→ pages 76–77

- B: 32
- A: 4 tens and 5 ones is 45.
- B: 20 and 11 shows 31 not 41.
- C: 60
- D: 20

### Think!

C shows a different number. All the rest show 93, while C shows 39.



# Unit 2 – Addition and subtraction (I)

## I Fact families

→ pages 80–83

### Discover

- a) The number 7 represents apples in the tree.  
 The number 5 represents apples on the ground.  
 The number 12 represents the total number of apples.
- $7 + 5 = 12$                        $12 - 5 = 7$   
 $5 + 7 = 12$                        $12 - 7 = 5$

### Think together

- $3 + 5 = 8$                        $8 - 3 = 5$   
 $5 + 3 = 8$                        $8 - 5 = 3$
- a)  $10 + 6 = 16$  is correct.  
 b)  $16 - 10 = 6$  is correct.
- a) A part-whole model with 7 in the top circle, 3 in the bottom left circle and 4 in the bottom right circle.
- $3 + 4 = 7$                        $7 - 4 = 3$   
 $4 + 3 = 7$                        $7 - 3 = 4$   
 $7 = 4 + 3$                        $4 = 7 - 3$   
 $7 = 3 + 4$                        $3 = 7 - 4$

## 2 Learn number bonds

→ pages 84–87

### Discover

- a) The facts Gita is working out are about adding zero.  
 When you add zero the number does not change.
- b) Zac is adding 1. When you add 1, count to the next number.

### Think together

- $10 + 0 = 10$   
 $9 + 1 = 10$   
 $8 + 2 = 10$   
 $7 + 3 = 10$   
 $6 + 4 = 10$   
 $5 + 5 = 10$   
 $4 + 6 = 10$   
 $3 + 7 = 10$   
 $2 + 8 = 10$   
 $1 + 9 = 10$   
 $0 + 10 = 10$
- $2 + 2 = 4$                        $4 - 2 = 2$   
 $3 + 3 = 6$                        $6 - 3 = 3$   
 $4 + 4 = 8$                        $8 - 4 = 4$
- a) There will be a variety of answers here depending on children's own explanations. Counting on 2 is a good way to add 2.  
 b) Children's recall of facts by heart will vary.

## 3 Add and subtract two multiples of 10

→ pages 88–91

### Discover

- a) Milo has 5 pencils.  
 b) Mr Abbot has 50 pencils.

### Think together

- a) **7** pencils  
    **7** apples  
    4 ones + 3 ones = **7** ones  
    4 tens + 3 tens = **7** tens  
 b)  $4 + 3 = 7$   
     $40 + 30 = 70$
- $2 + 6 = 8$   
 $20 + 60 = 80$
- $50 + 10 = 60$   
 $10 + 50 = 60$   
 $10 = 60 - 50$   
 $60 - 50 = 10$

## 4 Complements to 100 (tens)

→ pages 92–95

### Discover

- a) There are 100 beads in total.  
 b)  $60 + 40 = 100$

### Think together

- a)  $50 + 50 = 100$   
 b) Children make their own number bonds to 100.
- $70 + 30 = 100$
- $10 + 90 = 100$   
 $20 + 80 = 100$   
 $30 + 70 = 100$   
 $40 + 60 = 100$   
 $50 + 50 = 100$   
 $60 + 40 = 100$   
 $70 + 30 = 100$   
 $80 + 20 = 100$   
 $90 + 10 = 100$   
 $100 + 0 = 100$

## 5 Add and subtract 1s

→ pages 96–99

### Discover

- a) There are 34 corn on the cobs on the table.  
    There are 5 corn on the cobs on the barbeque.  
 b) There are 39 corn on the cobs altogether.

**Think together**

- a)  $41 + 6 = 47$   
 b)  $52 + 4 = 56$
- a)  $42 + 5 = 47$        $45 + 2 = 47$   
 b)  $47 - 2 = 45$        $47 - 5 = 42$
- a) 23 eggs are left  
 b)  $18 - 3 = 15$   
     $28 - 3 = 25$   
     $38 - 3 = 35$   
     $48 - 3 = 45$   
 Children should notice the 10s digit going up by 1 each time.

**6 Add by making 10**

→ pages 100–103

**Discover**

- a) Sam has found 7 stars. Eva has found 5 stars.  
 Children show 7 and 5 on ten frames.  
 b) They have found 12 stars altogether.

**Think together**

- $7 + 3 + 3 = 13$
- They have 14 apples altogether.
- a)  $6 + 5 = 11$   
 b)  $8 + 5 = 13$   
 c)  $9 + 5 = 14$   
 d)  $5 + 7 = 12$

**7 Add using a number line**

→ pages 104–107

**Discover**

- a) There are 9 jumpers in the box.  
 There are 4 jumpers on the ground.  
 b) There are 13 jumpers altogether.

**Think together**

- $8 + 5 = 13$
- $7 + 6 = 13$   
 $8 + 3 = 11$   
 $9 + 5 = 14$   
 $6 + 8 = 14$
- They will have the same answer.  $5 + 7 = 12$  and  $7 + 5 = 12$ .

**8 Add three 1-digit numbers**

→ pages 108–111

**Discover**

- a) Kendi is holding up 7 fingers, Malik is holding up 3 fingers, Lily is holding up 5 fingers.  
 b) There are 15 fingers and thumbs altogether.

**Think together**

- a) 8 fingers  
 b) 13 fingers
- $8 + 5 + 6 = 19$
- $5 + 7 + 5 = 17$

**9 Add to the next 10**

→ pages 112–115

**Discover**

- a) There are 23 cups in total.  
 b) 7  
 $23 + 7 = 30$

**Think together**

- $8 + 2 = 10$   
 $28 + 2 = 30$
- $3 + 7 = 10$   
 $33 + 7 = 30$   
 $43 + 7 = 50$   
 $73 + 7 = 80$
- a)  $14 + 6 = 20$   
 b)  $55 + 5 = 60$   
 c)  $86 + 4 = 90$

**10 Add across a 10**

→ pages 116–119

**Discover**

- a) There are 45 chairs stacked.  
 b) There are 52 chairs altogether.

**Think together**

- $27 + 8 = 27 + 3 + 5 = 35$ . There are 35 stars in total.
- $34 + 8 = 34 + 6 + 2 = 42$
- $47 + 6$  and  $49 + 6$  will be greater than 50.



## I1 Subtract across a 10

→ pages 120–123

### Discover

- a) There are 13 pencils.  
b) There are 8 pencils left.

### Think together

- $12 - 2 - 3$ ;  $12 - 5 = 7$
- $14 - 8 = 6$ ;  $14 - 4 - 4 = 6$
- $13 - 7 = 6$ . Dan needs to make another jump of 4.

## I2 Subtract from a 10

→ pages 124–127

### Discover

- a) There are 7 pencils left in the pack.  
b) There will be 27 pens left.  
There will be 47 rubbers left.

### Think together

- $40 - 8 = 32$
- a)  $30 - 5 = 25$   
b)  $30 - 7 = 23$
- $10 - 2 = 8$   
 $50 - 2 = 48$   
 $80 - 2 = 78$

## I3 Subtract a 1-digit number from a 2-digit number – across 10

→ pages 128–131

### Discover

- a) Children show 35 on ten frames.  
b)  $35 - 6 = 29$   
There are 29 children in Class B today.

### Think together

- $24 - 4 - 2 = 18$   
 $24 - 6 = 18$
- a)  $34 - 7 = 34 - 4 - 3 = 27$   
b)  $46 - 7 = 46 - 6 - 1 = 39$   
c)  $55 - 7 = 55 - 5 - 2 = 48$
- Both calculations use the digits 3, 7 and 4, and both involve a subtraction.  
In the first, you start at 37 and jump back 4 to get 33. This does not cross a 10.  
In the second, you start at 34 and jump back 7 to give 27. This calculation crosses a 10.

## End of unit check

→ pages 132–133

- C:  $70 + 20 = 90$  not 100
- C: 13
- B: 80
- D: 4
- A:  $64 - 8$
- A: 26

### Think!

There will be a variety of answers here depending on children's methods.



# Unit 3 – Addition and subtraction (2)

## I 10 more, 10 less

→ pages 136–139

### Discover

- a) Jen has 53 points now.  
b) Tom has 47 points now.

### Think together

- 10 more than 76 is 86.
- a) 23 33 43 **53** **63** **73** **83** **93** **103**  
b) 84 74 **64** **54** **44** 34 **24** **14** **4**
- a) 10 more than 73 is 83.  
b) 10 less than 64 is 54.  
c) 10 more than 58 is 68.  
35 is 10 more than 25.  
10 less than 99 is 89.

## 2 Add and subtract 10s

→ pages 140–143

### Discover

- a) There are 16 toffee apples on the table.  
There are 30 toffee apples on the ground.  
b) There are 46 toffee apples in total.

### Think together

- a)  $25 + 30 = 55$   
b)  $36 + 40 = 76$
- a)  $51 - 20 = 31$   
b)  $76 - 50 = 26$
- a)  $36 + 20 = 56$   
b)  $35 + 20 = 55$   
 $35 + 30 = 65$   
 $35 + 40 = 75$   
 $17 + 60 = 77$   
 $24 + 60 = 84$   
 $31 + 60 = 91$

## 3 Add two 2-digit numbers – add 10s and add 1s

→ pages 144–147

### Discover

- a) Milo and Seth can combine their base 10 equipment.  
b)  $43 + 14 = 57$

### Think together

- a) Children make or draw the numbers.  
b)  $42 + 25 = 67$
- $31 + 26 = 56$   
 $18 + 61 = 79$   
 $44 + 55 = 99$
- a)  $35 + 27 = 62$   
b)  $24 + 18 = 42$   
 $51 + 29 = 80$   
 $47 + 46 = 93$

## 4 Add two 2-digit numbers – add more 10s then more 1s

→ pages 148–151

### Discover

- a) There are 33 parcels in the van.  
b) There are now 35 parcels in the van.

### Think together

- a) Children make or draw 35.  
b)  $35 + 13 = 48$
- $32 + 24 = 56$
- $38 + 25 = 63$   
 $34 + 10 + 8 = 52$   
 $56 + 29 = 85$   
 $47 + 37 = 84$

## 5 Subtract a 2-digit number from a 2-digit number – not across 10

→ pages 152–155

### Discover

- a) There are 15 eggs left.  
b) There are 13 eggs left.

### Think together

- a)  $38 - 10 = 28$   
b)  $38 - 15 = 23$
- a)  $44 - 13 = 31$   
 $44 - 31 = 11$   
b) The starting number is the same. The digits in the second number are the same, just the other way round.
- $64 - 13 = 51$   
 $48 - 35 = 13$





## 6 Subtract a 2-digit number from a 2-digit number – across 10

→ pages 156–159

### Discover

- a) There are 14 strawberries left in Kara's tray.  
 b) There are 9 strawberries left in Kara's tray.

### Think together

- a)  $32 - 10 = 22$   
 b)  $32 - 13 = 19$
- a)  $52 - 15 = 37$   
 b)  $52 - 25 = 27$

Children may come up with multiple answers to this question. One thing that is the same is that both jumps cross a ten. A difference is that for b), children are likely to have to make four jumps instead of three to take into account the extra 10.

- a)  $21 - 7 = 14$   
 $51 - 7 = 44$   
 $31 - 7 = 24$   
 $61 - 7 = 54$   
 $41 - 7 = 34$   
 b)  $51 - 17 = 34$   
 $61 - 17 = 44$   
 $41 - 17 = 24$   
 $21 - 17 = 4$   
 $81 - 17 = 64$

## 7 How many more? How many fewer?

→ pages 160–163

### Discover

- a) There are 2 more children in the back row.  
 b) There are 2 fewer children in the front row.

### Think together

- 11 is 6 more than 5.  
5 is 6 less than 11.
- 7 is 10 less than 17.  
17 is 10 more than 7.
- Any two numbers with a difference of 5.  
From Dexter's number line, the pairs are: 0 and 5;  
1 and 6; 2 and 7; 3 and 8; 4 and 9; 5 and 10; 7 and 12;  
8 and 13; 9 and 14; 10 and 15.

## 8 Subtraction – find the difference

→ pages 164–167

### Discover

- a) John is 13 years older than Sofia.  
 b)  $43 - 30 = 13$

### Think together

- 11 is 9 less than 20.  
20 is 9 more than 11.  
The difference between 11 and 20 is 9.
- $25 - 21 = 4$   
25 is 4 more than 21.  
21 is 4 less than 25.  
The difference between 21 and 25 is 4.
- $35 - 32 = 3$   
 $12 - 9 = 3$   
 $60 - 57 = 3$   
 $65 - 11 = 54$   
 $81 - 79 = 2$

## 9 Compare number sentences

→ pages 168–171

### Discover

- a)  $7 + 1 + 3$ ;  $1 + 2 + 8$ ;  $8 + 3$   
 b)  $8 + 3 = 10 + 1$

### Think together

- a)  $6 + 2 = 5 + 3$   
 b)  $6 + 2 = 4 + 4$
- a)  $4 + 3 > 4 + 2$   
 b)  $8 - 2 > 8 - 3$
- a) 1st box: any number between 0 and 7  
 (smallest number is 0); 2nd box: 0, 1 or 2  
 (smallest number is 0).  
 b)  $5 + 1 = 6 + 0$   
 $8 + 3 = 9 + 2$   
 $9 + 9 = 10 + 8$   
 $39 + 16 = 40 + 15$

## 10 Missing number problems

→ pages 172–175

### Discover

- a) A part-whole model with 45 as the whole and ?  
 and 30 as the parts.  
 b)  $45 - 30 = 15$ .  
 Fred's missing number is 15.

**Think together**

1. a) 4  
b)  $19 - 4 = 15$
2. Star = 20  
Cloud = 1  
Triangle = 5
3. a) Rhombus = 2  
Triangle = 16  
Cloud = 16  
Heart = 2  
b) Circle = 5  
Triangle = 9  
Heart = 7  
The first two columns do not add up to 20.

**11 Mixed addition and subtraction**

→ pages 176–179

**Discover**

1. a) Mr Dean has 87 stickers.  
b) Mr Dean has 42 stickers left.

**Think together**

1.  $45 - 27 = 18$ . 18 pupils have a packed lunch.
2.  $35 + 16 = 51$ . There are 51 stickers altogether.
3. Mrs Bell uses 21 stickers altogether.

**12 Two-step problems**

→ pages 180–183

**Discover**

1. a) There are 61 marbles in Amy's and Kasmin's pots altogether.  
b) There are 25 more marbles in Kat's pot than in Ben's pot.

**Think together**

1.  $17 + 24 = 41$ . There are 41 marbles.
2.  $42 + 15 = 57$ . There are 57 marbles in Maya's pot.
3.  $17 + 19 = 36$   
 $36 - 24 = 12$   
There are now 12 more marbles in Ben's pot than in Amy's pot.

**End of unit check**

→ pages 184–185

1. C: 58
2. C: 47
3. B: 45
4. D:  $52 - 17$
5. D: 28

**Think!**

The part-whole model is the odd one out because the total of the 1s is less than 10; 3 ones plus 2 ones equals 5 ones, 2 tens and 5 tens equals 7 tens, so the answer is 75.

The other questions are also addition, as we know both of the parts and not the whole. However, in those, the total of the 1s is more than 10: 6 ones plus 9 ones is 15 ones and 7 ones plus 8 ones is 15 ones; and 15 ones is greater than 10 ones.

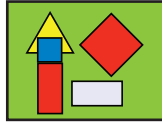
# Unit 4 – Properties of shapes

## I Recognise 2D and 3D shapes

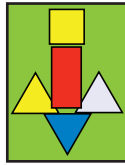
→ pages 188–191

### Discover

1. a) This is Mia's picture.



b) This is Sunil's picture.



### Think together

- There are 7 rectangles in the picture (2 squares and 5 oblongs).
- The 3D shapes are a cylinder, cube, cuboid, triangular prism and a square-based pyramid. The circle can be printed using the cylinder. The square can be printed using the cube, cuboid or square-based pyramid. The oblong can be printed using the cuboid or triangular prism. The triangle can be printed using the triangular prism or square-based pyramid.
- The cube can produce a square. The cuboid can produce a square or an oblong. The square-based pyramid can produce a square or a triangle. The triangular prism can produce a triangle or an oblong. The cone can produce a circle. The cylinder can produce a circle. The sphere cannot be used to produce a 2D shape.

## 2 Count sides on 2D shapes

→ pages 192–195

### Discover

- 5
  - No. Kirsty has enough pens for four of the shapes, but not enough for the hexagon.

### Think together

- Square, oblong, kite, reflex kite
- The shapes have 3 sides, 4 sides, 5 sides and 5 sides respectively.
- From left to right, top to bottom, the number of sides are: 4, 3, 3, 5, 4, 6, 4 and 4.  
There are four quadrilaterals.  
There is one pentagon.  
There is one hexagon.

## 3 Count vertices on 2D shapes

→ pages 196–199

### Discover

- 4 fingers are needed for a square. 5 fingers are needed for a pentagon.
  - You can only make a triangle.

### Think together

- From left to right, top to bottom, the number of vertices on each shape is: 4, 4, 6, 5 and 5.
- From left to right, top to bottom, the number of vertices on each shape is: 6, 6, 6, 6, 5 and 6.
- Shape A: 6 sides, 6 vertices  
Shape B: 4 sides, 4 vertices  
Shape C: 8 sides, 8 vertices  
The number of sides is the same as the number of vertices.

## 4 Draw 2D shapes

→ pages 200–203

### Discover

- Children must draw a shape with four straight sides of the same length and with four right angles, using a ruler and squared paper.
  - Children must draw a shape with three straight sides and three vertices, using a ruler.

### Think together

- A rectangle, four squares by two squares; a square, three squares by three squares.
- The triangles should accurately match those in the **Textbook**.
- The shapes should accurately match those in the **Textbook**.

## 5 Lines of symmetry on shapes

→ pages 204–207

### Discover

- The shape will look like a person when it is unfolded.
  - The shape will look like a heart when it is unfolded.

### Think together

- Circle, star, smiley face, house
- Check the shapes are completed correctly.  
Top row: a square, an isosceles triangle  
Bottom row: a square, an oblong
- From left to right, top to bottom: no, no, yes, yes and no.



## 6 Sort 2D shapes

→ pages 208–211

### Discover

- a) An inverted kite is not a triangle.  
b) A trapezium is not a rectangle.

### Think together

- There is more than one possible answer. Examples would be: 'Polygons with 3 sides', 'Polygons with more than 3 sides' and 'Not polygons'.
- A, D, E and F (same number of sides), C, B
- There is more than one possible way. Examples would be: '4 vertices' and 'Fewer than 4 vertices'.

## 7 Make patterns with 2D shapes

→ pages 212–215

### Discover

- a) C is the correct option to complete the pattern.  
b) The 20th shape must be a circle.

### Think together

- ▲ ▼
- ▲
- - 
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## 8 Count faces on 3D shapes

→ pages 216–219

### Discover

- a) Will needs 6 different colours.  
b) Each face is a rectangle.

### Think together

- The cube has 6 faces; the square-based pyramid has 5 faces; the cuboid has 6 faces.
- Anna will need 1 square face.
  - Anna will need 4 triangular faces.
  - She will need 5 faces in total.
- The sphere has no faces; the cylinder has 2 circular faces; the cone has 1 circular face; the ovoid has no faces; the hemisphere has 1 circular face.

## 9 Count edges on 3D shapes

→ pages 220–223

### Discover

- Hassan needs 12 straws to make a cube.
  - Each cube has 6 square faces and 12 edges, and this fact stays the same. The length of each edge and the size of each face change between the cubes.

### Think together

- 6, 12, 9
- Cube: 12 edges; triangular prism: 9 edges; square-based pyramids: 8 edges
- All 3D shapes with flat faces have more edges than faces. Cylinders and hemispheres do not.

## 10 Count vertices on 3D shapes

→ pages 224–227

### Discover

- Mia needs 4 joining tubes for the triangle-based pyramid.
  - Mia needs 5 joining tubes for the square-based pyramid.

### Think together

- 8, 4, 8
- Pentagon-based pyramid needs 6 joining tubes; hexagon-based pyramid needs 7; triangle-based pyramid needs 4; oblong-based pyramid needs 5.
- Yes, she would have to make a cuboid using  $1 \times 1 \times 8$ ,  $1 \times 2 \times 4$  or  $2 \times 2 \times 2$ .

## 11 Sort 3D shapes

→ pages 228–231

### Discover

- The sphere, square-based pyramid, triangular prisms and cone are in the wrong groups. The sphere, triangular prisms and the cone belong in the 'Other' group as they are not pyramids and they do not have 6 faces.
  - A pentagon-based pyramid could go in both groups as it is a pyramid and has 6 faces.

### Think together

- The sphere, hemisphere, cylinder and triangle-based pyramid all have fewer than 10 edges. The cube, cuboids and pentagonal prism all have more than 10 edges.



2. The order of fewest faces to most faces is C, A and D (same number of sides), E, B. The order would be the same if they were sorted by edges or vertices.
3. There is more than one way to solve this. Examples might be 'curved surfaces', 'flat surfaces', 'number of edges', 'number of faces' or 'number of vertices'.

## 12 Make patterns with 3D shapes

→ pages 232–235

### Discover

1. a) It is a symmetrical pattern with the line of symmetry running down the centre of the blue cuboid.  
b) The cylinder has to be in the centre, with two identical shapes either side and the final two identical shapes at either end.

### Think together

1. In the first pattern, the missing shapes are a cube and a sphere. In the second pattern, the missing shapes are a sphere and a cube.
2. There are various solutions to this problem. Check children's answers to ensure the patterns are symmetrical.
3. There are various solutions to this problem. Check children's answers to ensure they have created both a symmetrical and a repeating pattern.

## End of unit check

→ pages 236–237

1. D: It has 5 sides.
2. B
3. A
4. C
5. D

### Think!

There are various solutions to this problem.