

Unit 5: Multiplication and division (2)

Lesson 1: Comparing multiplication and division statements (I)

→ pages 6–8

- $5 \times 10 < 6 \times 10$
Aki has the least number of biscuits.
 - $3 \times 5 < 4 \times 5$ (or $4 \times 5 > 3 \times 5$)
Amelia has the most cherries.
- $4 \times 4 < 8 \times 4$ (or $8 \times 4 > 4 \times 4$)
The ladybirds have the most spots in total.
- $20 \div 5 > 20 \div 10$ (or $20 \div 10 < 20 \div 5$)
Jamie makes the most towers.
- a) < e) <
 - b) > f) <
 - c) = g) >
 - d) >
- a) 0, 1, 2, 3 or 4
 - b) 4
 - c) 1 or 2 or 3
 - d) The left-hand number must be smaller than the right-hand number.
- Max is not correct. Mugs must hold more as you only fill 3, whereas the same size bottle can fill 5 glasses.

Reflect

If you divide 12 by the circle you get a smaller answer than if you divide 12 by the square, so the circle must be greater. Some children may notice that the first expression can provide further refinement. For example, if the circle is 8, the square must be less than 5. If the circle is 1, the square must be less than $\frac{5}{8}$.

Lesson 2: Related multiplication calculations

→ pages 9–11

- $2 \times 3 = 6$
There are 6 pins.
 - $2 \times 30 = 60$
There are 60 pins.
- $3 \times 2 = 6$
Player 1's score is 6.
 - $3 \times 20 = 60$
Player 2's score is 60.
- $3 \times 5 \times 1 = 15$ or $5 \times 3 \times 1 = 15$ (multiplied in any sequence – commutative law)
Jamie has 15 pence.

b) $3 \times 5 \times 10 = 150$ or $5 \times 3 \times 10 = 150$ (multiplied in any sequence – commutative law)
Richard has 150 pence.

- $6 \times 4 = 24$
 - $6 \times 40 = 240$
- 24; 240
 - 45; 450
 - 360; 240; 270; 150
 - 80; 160; 0; 220
- Answers will vary; for example: I know it will be 350, as 50 is 10 times bigger than 5 so my answer will be 10 times bigger.
Jottings may show $5 \times 7 = 35$
 $50 \times 7 = 350$

Reflect

Answers will vary; for example: I can work out 4×80 by multiplying the answer to 4×8 by 10, to get 320.

Lesson 3: Related multiplication and division calculations

→ pages 12–14

- 3 There are 3 cherries on each plate.
 - 30 There are 30 cherries on each plate.
- 8 b) 80
- $6 \times 4 = 24$; $4 \times 6 = 24$; $24 \div 6 = 4$; $24 \div 4 = 6$
 - $60 \times 4 = 240$; $4 \times 60 = 240$; $40 \times 6 = 240$
or $6 \times 40 = 240$
 $240 \div 4 = 60$; $240 \div 60 = 4$; $240 \div 40 = 6$
or $240 \div 6 = 40$
- | | | |
|------|-------|-------|
| a) 8 | b) 70 | c) 20 |
| 80 | 70 | 8 |
| 9 | 70 | 11 |
| 90 | 90 | 200 |
- Answers will vary; for example:
 $240 \div 20 = 12$ 12 pencils
 $240 \div 30 = 8$ 8 rubbers
 $240 \div 40 = 6$ 6 rulers
Allow correct combinations; for example: $\times 20 = 40$ and $5 \times 40 = 200$ so Jess could buy 2 pencils and 5 rulers.

Reflect

Answers will vary; for example: $80 \times 3 = 240$; $8 \times 30 = 240$;
 $24 \div 3 = 8$; $240 \div 30 = 8$.

Lesson 4: Comparing multiplication and division statements (2)

→ pages 15–17

- $6 \times 20 < 7 \times 20$
There are more mints in total in the bags.
- a) $4 \times 30 < 5 \times 30$
b) $1 \times 80 = 2 \times 40$
- a) $240 \div 3 > 240 \div 4$ or $240 \div 4 < 240 \div 3$
A box contains more sweets.
Answers will vary; for example: The same number of sweets is shared out in each case. There are fewer boxes than bags so more sweets must go in a box than go in a bag.
b) Each child receives 30 marbles. Each adult receives 30 marbles.
Both receive the same. Although there are more adults, there are also more marbles for them to share.
- a) $<$ d) $>$
b) $>$ e) $>$
c) $>$ f) $>$
- Answers may vary but: $\heartsuit < \spadesuit$, $\heartsuit < \circ$
Assuming divisions have whole number answers there are two possible solutions:
 $\heartsuit = 6$, $\triangle = 4$, $\circ = 7$, $\spadesuit = 8$, $\heartsuit = 5$
 $\heartsuit = 4$, $\triangle = 8$, $\circ = 7$, $\spadesuit = 6$, $\heartsuit = 5$

Reflect

Left-hand box must have a number greater than 3.
Right-hand box must have a number less than 4.

Reasons will vary; for example: Multiplying by a bigger number makes things bigger, and so does dividing by a smaller number.

Lesson 5: Multiplying a 2-digit number by a 1-digit number (I)

→ pages 18–20

- 2×3 ones = 6 ones
 $2 \times 3 = 6$
 2×4 tens = 8 tens
 $2 \times 40 = 80$
 $6 + 80 = 86$
 $2 \times 43 = 86$
There are 86 pencils in total.

- 4×2 1s = 8 1s
 $4 \times 2 = 8$
 4×2 10s = 8 10s
 $4 \times 20 = 80$
 $8 + 80 = 88$
 $4 \times 22 = 88$
There are 88 in total.
- a) 3×2 1s = 6 1s
 $3 \times 2 = 6$
 3×3 10s = 9 10s
 $3 \times 30 = 90$
 $6 + 90 = 96$
So, $32 \times 3 = 96$
b) 4×2 1s = 8 1s
 $4 \times 2 = 8$
 4×2 10s = 8 10s
 $4 \times 20 = 80$
 $8 + 80 = 88$
So, $22 \times 4 = 88$
- a) $14 \times 2 = 28$
b) $3 \times 33 = 99$
- a) $2 \times 20 = 40$
 $2 \times 3 = 6$
 $40 + 6 = 46$
b) $23 \times 2 = 46$
 $32 \times 3 = 96$
 $2 \times 43 = 86$

Reflect

Children should explain how they do 3×13 step by step; for example:

First I would work out $3 \times 10 = 30$.
Then I would work out $3 \times 3 = 9$.
Finally I would add $30 + 9 = 39$.
So $3 \times 13 = 39$.

Lesson 6: Multiplying a 2-digit number by a 1-digit number (2)

→ pages 21–23

- a) $3 \times 4 = 12$
 $3 \times 20 = 60$
 $60 + 12 = 72$
 $3 \times 24 = 72$
b) $5 \times 3 = 15$
 $5 \times 10 = 50$
 $50 + 15 = 65$
 $5 \times 13 = 65$
c) Children may draw 2 tens and 8 ones in two of the rows of the place value grid.
 $2 \times 8 = 16$
 $2 \times 20 = 40$
 $40 + 16 = 56$
 $2 \times 28 = 56$
- a) $3 \times 5 = 15$
 $3 \times 30 = 90$
 $90 + 15 = 105$
 $35 \times 3 = 105$
b) $4 \times 5 = 20$
 $4 \times 20 = 80$
 $80 + 20 = 100$
 $4 \times 25 = 100$
Allow variation; for example: $5 \times 3 = 15$.
- a) $3 \times 26 = 78$
b) $6 \times 14 = 84$
- There are 165 litres of paint in total.
- a) $3 \times 17 = 51$
b) $2 \times 49 = 98$
- a) $56 \times 3 \rightarrow 168$
 $26 \times 8 \rightarrow 208$
 $37 \times 5 \rightarrow 185$

Reflect

The numbers are different but the answers are the same.

Lesson 7: Multiplying a 2-digit number by a 1-digit number (3)

→ pages 24–26

$$\begin{array}{r} 1. \text{ a) } 15 \quad (5 \times 3) \quad \text{b) } 28 \quad (7 \times 4) \\ + 60 \quad (20 \times 3) \quad + 40 \quad (10 \times 4) \\ \hline 75 \quad \quad \quad 68 \end{array}$$

$$\begin{array}{r} 2. \text{ a) } 18 \quad (6 \times 3) \quad \text{b) } 16 \quad (8 \times 2) \\ + 30 \quad (10 \times 3) \quad + 80 \quad (40 \times 2) \\ \hline 48 \quad \quad \quad 96 \end{array}$$

$$\begin{array}{r} 3. \text{ a) } 14 \quad \quad \quad \text{b) } 19 \\ \times 5 \quad \quad \quad \times 4 \\ \hline 20 \quad (4 \times 5) \quad 36 \quad (9 \times 4) \\ 50 \quad (10 \times 5) \quad 40 \quad (10 \times 4) \\ \hline 70 \quad \quad \quad 76 \end{array}$$

$$\begin{array}{r} 4. \text{ a) } 12 \quad \quad \quad \text{b) } 21 \\ \times 4 \quad \quad \quad \times 4 \\ \hline 8 \quad (2 \times 4) \quad 4 \quad (1 \times 4) \\ 40 \quad (10 \times 4) \quad 80 \quad (20 \times 4) \\ \hline 48 \quad \quad \quad 84 \end{array}$$

5. Jamie should have remembered that when you multiply by 1 the number doesn't change, so $26 \times 1 = 26$.

$$\begin{array}{r} 6. \text{ a) } 35 \quad \quad \quad \text{b) } 18 \\ \times 3 \quad \quad \quad \times 6 \\ \hline 15 \quad 5 \times 3 \quad 48 \quad 8 \times 6 \\ 90 \quad 30 \times 3 \quad 60 \quad 10 \times 6 \\ \hline 105 \quad \quad \quad 108 \end{array}$$

$$\begin{array}{r} 7. \quad 55 \\ \times 3 \\ \hline 15 \\ 150 \\ \hline 165 \end{array}$$

♥ = 0

(Multiplying the 10s will give an answer that is a multiple of 10.)

● = 5

(This is the only digit which, when multiplied by 3, has an answer ending in the digit.)

$3 \times 5 = 15$, so $\triangle = 1$

Reflect

Children should show correct method for 23×5 .

$$\begin{array}{r} 23 \\ \times 5 \\ \hline 15 \quad 3 \times 5 \\ 100 \quad 20 \times 5 \\ \hline 115 \end{array}$$

Lesson 8: Dividing a 2-digit number by a 1-digit number (1)

→ pages 27–29

1. $2 \text{ tens} \div 2 = 1 \text{ ten}$
 $20 \div 2 = 10$
 $8 \text{ ones} \div 2 = 4 \text{ ones}$
 $8 \div 2 = 4$
 $10 + 4 = 14$
 $28 \div 2 = 14$
 Each basket has 14 apples.

2. a) $6 \text{ tens} \div 3 = 2 \text{ tens}$
 $60 \div 3 = 20$
 $9 \text{ ones} \div 3 = 3$
 $9 \div 3 = 3$
 $20 + 3 = 23$ So, $69 \div 3 = 23$
 b) $8 \text{ tens} \div 4 = 2 \text{ tens}$
 $80 \div 4 = 20$
 $8 \text{ ones} \div 4 = 2 \text{ ones}$
 $8 \div 4 = 2$
 $20 + 2 = 22$ So, $84 \div 4 = 22$

3. 85 can be partitioned into 50 and 35.
 $5 \text{ tens} \div 5 = 1 \text{ ten}$
 $50 \div 5 = 10$
 $35 \text{ ones} \div 5 = 7 \text{ ones}$
 $35 \div 5 = 7$
 $10 + 7 = 17$
 $85 \div 5 = 17$

4. a) $96 \div 3 = 32$
 96 (whole), 90 and 6 (parts) in part-whole model.
 $90 \div 3 = 30$ $6 \div 3 = 2$
 b) $86 \div 2 = 43$
 86 (whole), 80 and 6 (parts) in part-whole model.
 $80 \div 2 = 40$ $6 \div 2 = 3$

5. $36 \div 3 = 12$
 $63 \div 3 = 21$
 $69 \div 3 = 23$
 $96 \div 3 = 32$

Reflect

To work out $84 \div 4$, first I would work out $80 \div 4 = 20$. Then I would work out $4 \div 4 = 1$. Finally, I would work out $20 + 1 = 21$.

Lesson 9: Dividing a 2-digit number by a 1-digit number (2)

→ pages 30–32

1. a) $30 \div 3 = 10$
 $15 \div 3 = 5$
 $10 + 5 = 15$ (or $5 + 10$)
 $45 \div 3 = 15$

- b) $20 \div 2 = 10$
 $14 \div 2 = 7$
 $10 + 7 = 17$
 $34 \div 2 = 17$
 c) $50 \div 5 = 10$
 $15 \div 5 = 3$
 $10 + 3 = 13$ (or $3 + 10$)
 $65 \div 5 = 13$

2. $60 \div 3 = 20$ $30 \div 3 = 10$
 $18 \div 3 = 6$ $30 \div 3 = 10$
 $20 + 6 = 26$ $18 \div 3 = 6$
 $78 \div 3 = 26$ $10 + 10 + 6 = 26$
 $78 \div 3 = 26$

3. a) $72 \div 2 = 36$
 72 (whole), 60 and 12 (parts) in part-whole model (parts may vary).
 b) $72 \div 3 = 24$
 72 (whole), 60 and 12 (parts) in part-whole model (parts may vary).
 c) $85 \div 5 = 17$
 85 (whole), 50 and 35 (parts) in part-whole model (parts may vary).
 d) $57 \div 3 = 19$
 57 (whole), 30 and 27 (parts) in part-whole model (parts may vary).

4. $84 \div 3 = 28$
 There are enough ice cubes.

5. a) $52 \div 4 = 13$ or $72 \div 4 = 18$
 b) $90 \div 5 = 18$ or $95 \div 5 = 19$
 c) $54 \div 3 = 18$ or $84 \div 3 = 28$

Reflect

Model d) does not help work out $92 \div 4$ because 70 and 22 are not multiples of 4, whereas the parts in all the other part-whole models are.

Lesson 10: Dividing a 2-digit number by a 1-digit number (3)

→ pages 33–35

1. a) $40 \div 2 = 20$
 $5 \div 2 = 2$ remainder 1
 $45 \div 2 = 22$ remainder 1
 22 tins can go on each shelf.
 b) The remainder is 1, so 1 tin cannot be put on the shelf.
 2. a) Answers will vary; for example: because 53 is an odd number and all multiples of four are even.
 b) $40 \div 4 = 10$
 $13 \div 4 = 3$ r 1
 $53 \div 4 = 13$ r 1

3. a) $83 \div 4 = 20$ r 3 c) $83 \div 3 = 27$ r 2
 83 partitioned into 60 and 23.
 b) $83 \div 5 = 16$ r 3 d) $83 \div 8 = 10$ r 3
 83 partitioned into 80 and 3.
 4. $77 \div 5 = 15$ r 2 77 (whole), 50 and 27 (parts) in part-whole model.

5. Ambika's number must be 53.

Reflect

Answers will vary; for example:

- $67 \div 2$ has a remainder, as 67 is odd. 33 r 1
 $67 \div 3$ has a remainder, as 60 can be divided by 3 exactly but $7 \div 3 = 2$ r 1. 22 r 1
 $67 \div 4$ has a remainder, as all multiples of 4 are even. 16 r 3
 $67 \div 5$ has a remainder, as all multiples of 5 have a 5 or 0 in the ones column. 13 r 2

Lesson 11: How many ways?

→ pages 36–38

1. a) Answers should be in the format: letter, number. Ideally they should also be presented systematically. Answers are:
 A1, A2, A3, B1, B2, B3, C1, C2, C3
 b) $3 \times 3 = 9$
 There are 9 ways.
 2. a) $5 \times 2 = 10$ (accept $2 \times 5 = 10$)
 There are 10 ways.
 b) $\triangle, X; \triangle, Y; \triangle, X; \triangle, Y; \triangle, X; \triangle, Y; \triangle, X; \triangle, Y; \triangle, X; \triangle, Y$
 X; $\triangle, Y$
 c) There are 24 ways.
 3. There are 20 ways.
 4. Answers will vary and should show 6 ways; for example: for colours red (R), blue (B) and yellow (Y):
 RB, RY, BR, BY, YR, YB. Some children may choose to use white (W) as a further option, in which case they should find 12 ways (additional ways are WR, RW, WB, BW, WY, YW); in this case, accept any 8 correct answers in the spaces given.

Reflect

To work out the number of ways, I would multiply the number of choices in the first set by the number of choices in the second set.

Lesson 12: Problem solving – mixed problems (I)

→ pages 39–41

- $15 \times 3 = 45$. There are 45 cakes in total.
- $64 \div 4 = 16$. There are 16 items of clothing in each drawer.
- $8 \times 12 = 96$. There is 96 ml of honey in the jar.
 - $96 \div 3 = 32$. There is 32 ml of honey in each bowl.
- $34 \times 3 = 102$. The tower is 102 m tall.
- $26 \times 3 = 39 \times 2 = 78$ 78 in middle row of bar model, 39 in each part of bottom row.
- $50 \div 5 = 10$
 $35 \div 5 = 7$
 $10 + 7 = 17$
 $85 \div 5 = 17$, so each book costs £17.
 $17 \times 2 = 34$
 2 books cost £34.

Reflect

Answers will vary. Children should have written a word problem that can be represented by either $18 \times 4 = 72$ or $72 \div 4 = 18$.

Lesson 13: Problem solving – mixed problems (2)

→ pages 42–44

- $4 \times 3 = 12$
 $6 \times 5 = 30$
 $30 + 12 = 42$ (addition in either order)
 Kate buys 42 ice creams in total.
- There are 21 more pears than apples.
- There are 48 balloons in 6 bags.
 - Reena needs to buy 10 packs.
- $3 \times 5 + 4 \times 5 = 7 \times 5$
They have 35 rulers altogether.
- $4 \times 3 + 5 \times 3 = 9 \times 3$
 - $8 \times 5 + 4 \times 5 = 12 \times 5$
 - $3 \times 8 + 8 = 4 \times 8$
 - $7 \times 4 - 2 \times 4 = 5 \times 4$
 - $5 \times 2 + 8 = 9 \times 2$
- $96 \text{ pence} - 60 \text{ pence} = 36 \text{ pence}$ for 2 slices of toast.
 $36 \text{ pence} \div 2 = 18 \text{ pence}$ for 1 slice of toast.
 $60 \text{ pence} - 18 \text{ pence} = 42 \text{ pence}$ for 2 eggs.
 $42 \div 2 = 21$
 The cost of an egg is 21 pence.

Reflect

Methods will vary; for example:

$$\begin{aligned}
 5 \times 6 &= 30 \\
 3 \times 6 &= 18 \\
 30 + 18 &= 48 \\
 \text{or } 5 + 3 &= 8 \\
 8 \times 6 &= 48
 \end{aligned}$$

Lesson 14: Problem solving – mixed problems (3)

→ pages 45–47

- $6 \times 4 = 24$
 $24 \div 3 = 8$ (or alternative method)
 Each person receives 8 beads.
 - $24 \div 4 = 6$
 Each person receives 6 beads.
- Missing value is 23.
 $63 - 17 = 46$
 $46 \div 2 = 23$
 So, smaller bar is 23, larger bar is $23 + 17 = 40$.
- Children = 35
 Adults = $35 \times 3 = 105$
 $105 + 35 = 140$ (alternatively, some may just work out 35×4)
 There are 140 people in total at the play.
- Box = $(6 \times 5 \text{ kg}) + 500 \text{ g} = 30 \text{ kg and } 500 \text{ g}$
 Giraffe = $4 \times \text{box}$
 $4 \times 30 \text{ kg} = 120 \text{ kg}$
 $4 \times 500 \text{ g} = 2,000 \text{ g} = 2 \text{ kg}$
 $120 \text{ kg} + 2 \text{ kg} = 122 \text{ kg}$
 So, the baby giraffe weighs 122 kg.
- $10 \times 2 \text{ kg} = 20 \text{ kg}$ $50 \text{ kg} - 20 \text{ kg} = 30 \text{ kg}$
 $30 \div 5 = 6$
 Max buys 6 5 kg sacks.
- $150 - 74 = 76$ $76 \div 2 = 38$
 $38 + 74 = 112$
 Danny's number is 112.
 Isla's number is 38.

Reflect

Children should state what they found easy and what they found challenging. Use this information to assess their understanding and provide same-day intervention as appropriate.



End of unit check

→ pages 48–50

My journal

1. a) $8 \times 15 = 120$. Methods may vary.
b) $87 \div 3 = 29$. Methods may vary.
2. a) 8 6 5 5 7
b) 8 8 5 6 6

Power puzzle

- a) $60 \times 3 = 180$ or $30 \times 60 = 180$
- b) $6 \times 4 + 9 \times 4 = 15 \times 4$ or $9 \times 4 + 6 \times 4 = 15 \times 4$
- c)

32	
× 4	
8	
<u>120</u>	
<u>128</u>	