

Mathematics Level 1

Chapter 2 — Number: adding, subtracting and modelling problems · 3 subtopics · 3 CDs

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Adding and subtracting within 20

Mathematics 1 · Level 1 · Chapter 2 — Number · Subtopic 2A. Teaching order: 6th of 15, after 1C.

Owens: VC2M1N04 — “add and subtract numbers within 20, using physical and virtual materials, part-part-whole knowledge to 10 and a variety of calculation strategies”. Quoted verbatim. Source: Victorian Curriculum F–10 Version 2.0, Mathematics (VCAA), Level 1, Number, VC2M1N04, via `maths_1.json` (VCAA export retrieved 2026-07-29).

Achievement standard (extract): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.” Quoted verbatim from the same source.

Elaborations drawn on: VC2M1N04.E01, .E02, .E03, .E04. VC2M1N04.E05 is not used — see the Teacher note.

Linked bank: 336 MCQs keyed to VC2M1N04 — digital asset only, not printed (TOC D12).

All task wording is read aloud by the teacher; responses are a numeral, a drawing, cubes on a ten-frame or a short number sentence (TOC D17). Student-facing text runs from “What we are learning” to “Answers”; the front matter above and the Teacher note at the end are for the teacher.

What we are learning

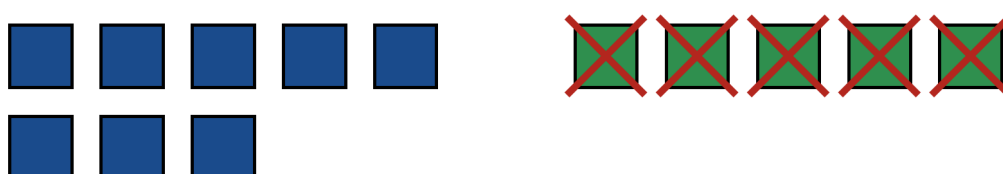
We can add and take away. We work with numbers up to 20.

Add means put together. 8 blocks and 5 more blocks is 13 blocks.



8 blue blocks and 5 green blocks. 13 blocks in all.

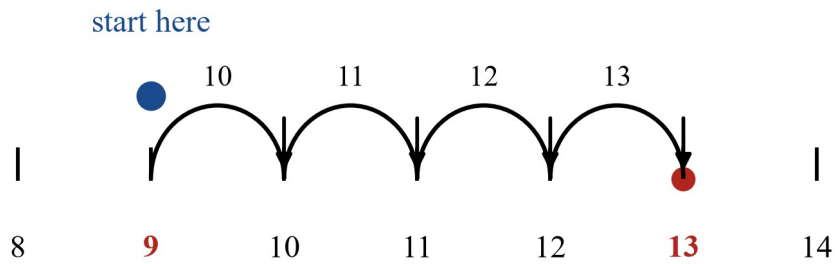
Take away means some are gone. 13 blocks, take away 5, and 8 blocks are left.



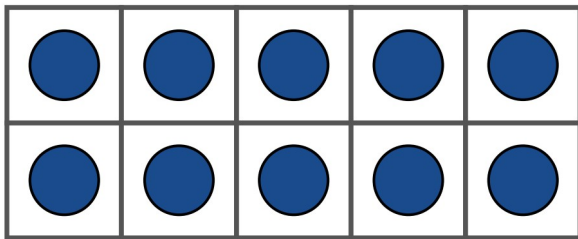
13 blocks. 8 blocks are left. 5 blocks have a red X on them.

New words:

- **count on** — start at one number and count up. To add $9 + 4$, start at 9 and count on: 10, 11, 12, 13.
- **count back** — start at one number and count down. To do $13 - 4$, start at 13 and count back: 12, 11, 10, 9.
- **make ten** — use pairs of numbers that make 10, like 8 and 2. $8 + 5$ is $8 + 2 + 3$. 8 and 2 make 10. 10 and 3 make 13.
- A **ten-frame** is 2 rows of 5 boxes. We put one cube in each box. One ten-frame is full at 10.
- A **sign** tells us what to do. $+$ means add. $-$ means take away. $=$ means the two sides are the same.
- A **number sentence** writes a story with $+$, $-$ and $=$. Here is one: $8 + 5 = 13$.
- **subitise** (say: sub-i-tise) — to see how many without counting. We can subitise 10 on a full ten-frame.
- A **Think Board** has 4 parts: the story, the cubes, the drawing and the number sentence.



A number line. Start at 9 and count on 4: 10, 11, 12, 13.



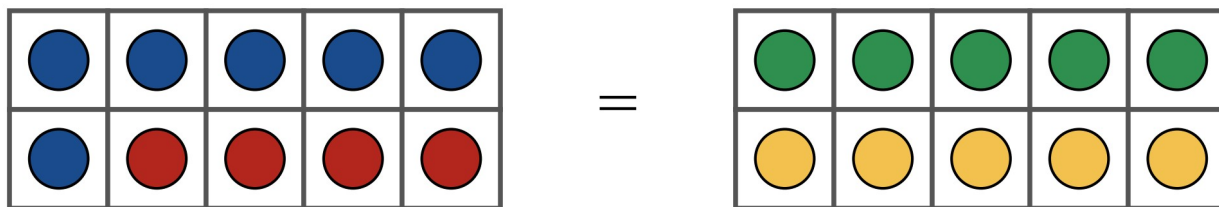
A ten-frame full of cubes: 10 cubes.

the story	the cubes
the drawing	the number sentence

A Think Board with 4 parts: the story, the cubes, the drawing and the number sentence.

The = means the same. Look at this:

$$6 + 4 = 5 + 5$$



A full ten-frame with 6 blue cubes and 4 red cubes. A full ten-frame with 5 green cubes and 5 yellow cubes. Both sides are 10.

Both sides are 10. The = says the two sides are the same. It does not mean “the answer goes here”.

Worked examples

Example 1 — add with ten-frames, make ten

Story: Mia has 9 shells. Zoe gives her 5 more. How many shells in all?

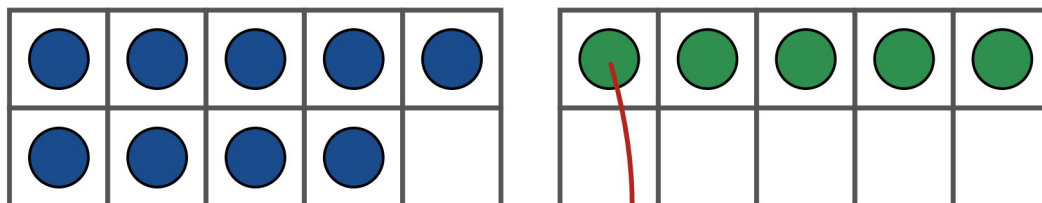
You need: 2 ten-frames and cubes.

What we do

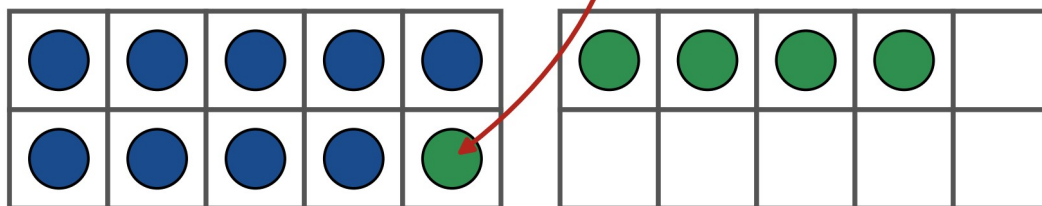
Why

- | | |
|---|-------------------------|
| 1. Put 9 cubes on one ten-frame. | Mia has 9 shells. |
| 2. Put 5 cubes on the next ten-frame. | Zoe gives 5 more. |
| 3. Move 1 cube to fill the first ten-frame. Now it is full. | 9 and 1 make 10. |
| 4. Look at your ten-frames: 10 and 4. | 5 take away 1 leaves 4. |
| 5. Count on from 10: 11, 12, 13, 14. | 10 and 4 is 14. |
| 6. Write the number sentence: $9 + 5 = 9 + 1 + 4 = 10 + 4 = 14$. | We made a ten to add. |

start: 9 and 5



then: 10 and 4



Start: 9 cubes and 5 cubes on two ten-frames. Then: 10 cubes and 4 cubes.

start: 9 and 5 then: 10 and 4



There are 14 shells in all. Check: $9 + 5 = 14$. ✓

Example 2 — take away, count back and use ten-frames

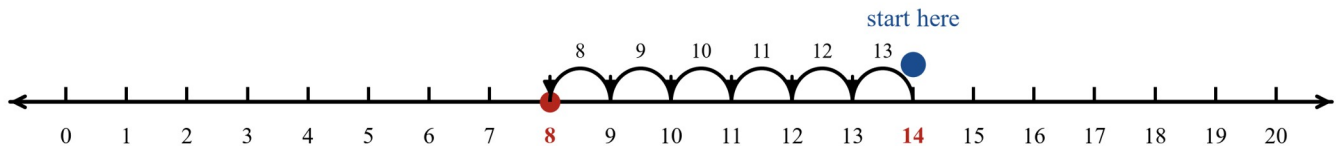
Story: 14 birds are on the grass. 6 fly away. How many birds are left?

You need: cubes, 2 ten-frames and a number line from 0 to 20.

What we do

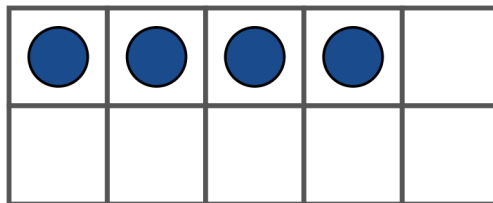
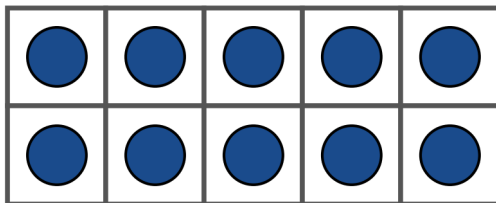
Why

- | | |
|--|------------------------------------|
| 1. Find 14 on the number line. | Start where the story starts. |
| 2. Jump back 6: 13, 12, 11, 10, 9, 8. | 6 birds fly away. |
| 3. We stop at 8. | 14 take away 6 is 8. |
| 4. Check with ten-frames: show 14 as a full ten-frame and 4. Take away 4 to get 10, then take away 2 more. | 6 is 4 and 2. 10 take away 2 is 8. |
| 5. Write the number sentence: $14 - 6 = 8$. | – means take away. |
| 6. Check: $8 + 6 = 14$. ✓ | Add back to check. |

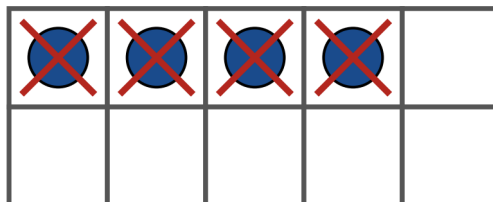
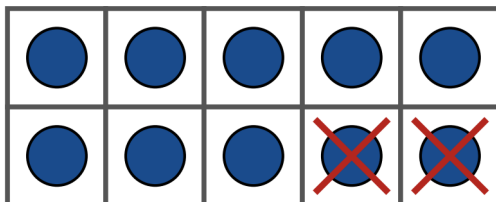


A number line from 0 to 20. Start at 14 and jump back 6: 13, 12, 11, 10, 9, 8.

14 is 10 and 4



take away 6: left with 8



14 cubes: 10 and 4. Take away 6 cubes. 8 cubes are left.

count back 6 from 14

$14 \rightarrow 13 \rightarrow 12 \rightarrow 11 \rightarrow 10 \rightarrow 9 \rightarrow 8$

14 is 10 and 4 take away 6: left with 8



There are 8 birds left. $14 - 6 = 8$. ✓

Now you try

With your teacher

Q1. Make ten to add. Use 2 ten-frames and cubes.

- (a) Show $7 + 6$ on your ten-frames. Move cubes to fill one ten-frame.
- (b) Fill in the boxes: $7 + 6 = 7 + 3 + \square = 10 + \square = \square$

Q2. Count on to add. Start at the big number.

- (a) $9 + 4$ — start at 9, count on 4: 10, 11, $\square$, $\square$
- (b) $8 + 5 = \square$

Q3. Count back to take away. Start at the big number.

- (a) $13 - 4$ — start at 13, count back 4: 12, 11, $\square$, $\square$
- (b) $17 - 5 = \square$

Q4. Use a Think Board.

Story: Ben has 10 eggs. Mia gives him 4 more. How many eggs in all?

the story | the cubes the drawing | the number sentence

the story	the cubes
the drawing	the number sentence

A Think Board with 4 parts: the story, the cubes, the drawing and the number sentence.

- (a) Show the story with cubes.
- (b) Draw the story.
- (c) Write the number sentence: $10 + 4 = \square$

Q5. The $=$ means the two sides are the same. Use cubes to make both sides the same.

- (a) $6 + 4 = 5 + \square$

(b) $8 + 2 = 3 + \square$

Q6. Take away with ten-frames.

(a) Show 12 on your ten-frames. Take away 5. How many are left?

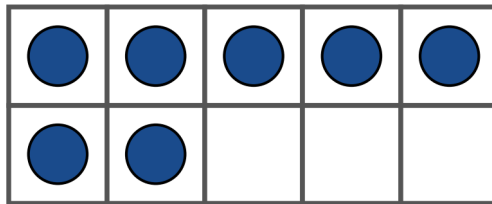
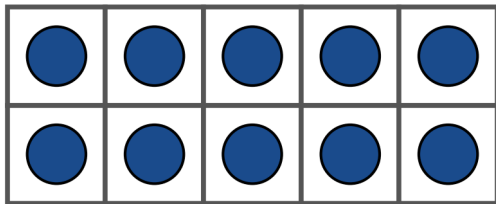
(b) Write the number sentence: $12 - 5 = \square$

On your own

Q7. Look at the ten-frames. Write the number sentence.

(a) 17 birds are on the grass. 3 more birds come. How many birds in all?

● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ○ ○ ○

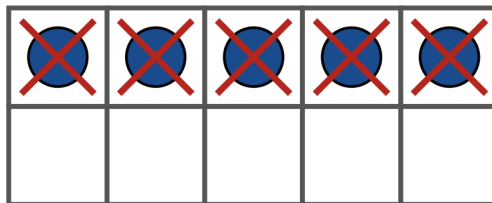
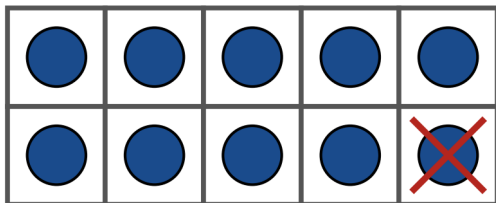


Two ten-frames. One is full and 7 more cubes are on the next ten-frame.

$\square + \square = \square$

(b) 15 ducks are on the pond. 6 go away. How many ducks are left?

● ● ● ● ● × × × × × ● ● ● ● × ○ ○ ○ ○ ○



Two ten-frames with 15 cubes. 6 cubes have a red X on them.

$\square - \square = \square$

Q8. Make ten to add. Fill in the boxes.

(a) $8 + 6 = 8 + \square + \square = 10 + \square = \square$

(b) $9 + 7 = 9 + \square + \square = 10 + \square = \square$

Q9. Work these out. Use any way you like: count on, count back, or make ten.

(a) $7 + 5 = \square$

(b) $15 - 6 = \square$

(c) $9 + 6 = \square$

(d) $17 - 8 = \square$

Q10. The = means the two sides are the same. Fill in the boxes.

(a) $7 + 5 = 10 + \square$

(b) $9 + 4 = \square + 5$

(c) $12 - 2 = \square + 4$

Q11. Use a Think Board.

Story: Zoe has 16 shells. She gives 7 to Noah. How many shells are left?

- (a) Fill in the 4 parts of the Think Board: the story, the cubes, the drawing and the number sentence.
- (b) Write the number sentence: $\square - \square = \square$

Q12. Read each story. Write the number sentence. Then work it out.

- (a) There are 8 apples in a box. Zoe puts in 6 more. How many apples in all?
- (b) Noah has 15 blocks. He gives 7 to Mia. How many blocks are left?

Q13. Is each one true? Write yes or no. If no, fix the number sentence.

- (a) $9 + 6 = 15$
- (b) $14 - 5 = 8$
- (c) $7 + 8 = 15$
- (d) $10 + 6 = 16$

Q14. Make your own story.

- (a) Write a story for $11 - 4 = 7$. Draw it.
 - (b) Mia has 12 blocks. Ben has 8 blocks. How many more blocks does Mia have? Write the number sentence and work it out.
-

Answers

Q1. (b) $7 + 6 = 7 + 3 + 3 = 10 + 3 = 13$

Q2. (a) 10, 11, 12, 13 — so $9 + 4 = 13$. (b) $8 + 5 = 13$

Q3. (a) 12, 11, 10, 9 — so $13 - 4 = 9$. (b) $17 - 5 = 12$

Q4. (c) $10 + 4 = 14$

Q5. (a) $6 + 4 = 5 + 5$. (b) $8 + 2 = 3 + 7$

Q6. (b) $12 - 5 = 7$

Q7. (a) $17 + 3 = 20$. (b) $15 - 6 = 9$

Q8. (a) $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$. (b) $9 + 7 = 9 + 1 + 6 = 10 + 6 = 16$

Q9. (a) 12. (b) 9. (c) 15. (d) 9

Q10. (a) $7 + 5 = 10 + 2$. (b) $9 + 4 = 8 + 5$. (c) $12 - 2 = 6 + 4$

Q11. (b) $16 - 7 = 9$

Q12. (a) $8 + 6 = 14$. (b) $15 - 7 = 8$

Q13. (a) Yes. (b) No — $14 - 5 = 9$. (c) Yes. (d) Yes

Q14. (a) Answers will not all be the same. One story: Noah has 11 shells. He gives 4 to Mia. 7 shells are left. (b) $12 - 8 = 4$. Mia has 4 more blocks.

Teacher note

Curriculum map. This subtopic owns VC2M1N04 in full (TOC §3, §4). The content description is delivered through a materials-based teaching sequence, two worked examples and the practice tasks, not through the elaborations one by one (D11): E01 (drawings, physical and virtual materials, number combinations within 10, collections to 20) → Example 1, Q1, Q4, Q6, Q7; E02 (counting on, counting back, partitioning and combining, part-part-whole to 10) → Example 1 and 2, Q2, Q3, Q8, Q9 — the make-ten chain in Example 1 is the partitioning-and-combining strategy E02 names; E03 (strategies built on part-part-whole to 10 and subitising) → the ten-frame subitising in “What we are learning”, Q1, Q7; E04 (story problems on a Think Board; recognising and using +, − and =; explaining connections between the materials and the numbers) → the New words block, Q4, Q11, and the “the = means the same” thread (Q5, Q10). All task wording is read aloud (D17); recording is a numeral, a drawing, cubes on a ten-frame or a short number sentence.

The equal sign. Per TOC §5 item 7, = is presented here as “the two sides are the same”, with items such as $7 + 5 = 10 + 2$ (Q10a), not only as $7 + 5 = \square$. The misconception that = means “write the answer here” forms at this level; Q5, Q10 and the “What we are learning” block rehearse the balance reading. Keep at least one such item in checkpoint T2.

Symbols, not algorithms (D9). +, − and = are the only operation symbols used, per VC2M1N04 .E04. No vertical algorithm appears anywhere in this subtopic; all calculation is done with materials, counting strategies and number sentences. The minus sign is printed as − (U+2212), never a hyphen (TOC §6).

Number range (D8). Every sum, difference and collection in this section stays within 20; the largest total is 20 (Q7a). Nothing exceeds the CD’s stated range.

E05 exclusion. VC2M1N04 .E05 (addition and subtraction stories told through Aboriginal and Torres Strait Islander dances) is not covered, per CONTENT_POLICY Rule 1 (DJB 2026-08-15): Aboriginal and Torres Strait Islander content is deliberately excluded from ClassBasics books because accuracy cannot be guaranteed. This is an

ACCEPTED exclusion, not a coverage gap: the CD itself is delivered in full through E01–E04 and everyday contexts (D11). This note stands in for the §2A entry TOC.md must carry; TOC.md is read-only from this authoring seat.

Materials. Counters; unifix/centi-cubes or other connecting cubes; ten-frames (two per student for Q1, Q6, Q7); a large number line from 0 to 20 for Example 2 and Q3; Think Board templates (a sheet ruled into the 4 parts named in Q4); whiteboards and markers. Where devices are available, a virtual ten-frame or number-line app may stand in for the physical materials — the CD names “physical and virtual materials”, and the mathematics is unchanged.

Assumed Foundation skills, rehearsed only (D3): counting to 20 and zero (VC2MFN01) in every count-on and count-back step; part-part-whole to 10 (VC2MFN04) in the make-ten work; subitising to 5 (VC2MFN02) extended to full ten-frames; representing practical additive situations (VC2MFN05) in the story problems. These are rehearsed in the opening minutes, not taught as new and not assessed as Foundation outcomes.

Also drawn on (already taught, in the recommended sequence): locating numbers on a number line — 1A (VC2M1N01), used in Example 2 and available for Q3 and Q9.

Level 2 destinations (named only, not taught — D3): VC2M2N04 (one- and two-digit addition and subtraction with number sentences) reuses the +, −, = literacy introduced here; VC2M2A02 and VC2M2A03 (fact recall to 20 and the twos facts) build on the part-part-whole foundations laid in this subtopic (TOC §5).

Assessment. Chapter checkpoint T2 (18 marks across VC2M1N04 + VC2M1N05 + VC2M1N06, 6 per CD): teacher-read, with counters, ten-frames and play money supplied, number sentences using +, −, = recorded (TOC §7). Items should score the strategy and the explanation, not only the answer — this CD’s achievement standard names calculation strategies explicitly.

Data note. Every story in this section uses invented children and everyday objects (shells, birds, eggs, apples, blocks, ducks); no external datum is asserted, so no source line is required beyond the curriculum quotation in the front matter (TOC §6). Child given names are invented, as permitted. All operations stay within 20 (D8); no metric units (D7), no chance language (D6), no clock faces, no fractions.

Vocabulary gate record (DJB 2026-08-18). Student-facing text — everything from “What we are learning” to “Answers” — is at or below the Yr1 ladder ceiling (rank 1), verified with `load_ladder/check_text/tokenize` from `S:\Files\projects\mcq-system\reports\vocab_level_check.py`. Result: CLEAN. Curriculum-exempt words retained per VOCABULARY_LEVEL.md exemption 1, each defined at first use where student-facing: *subtract/subtracting* (heading only, fixed by the TOC section title; the CD’s own word), *example(s)* (verbatim in VC2M1N04.E02 and .E03), *sign* and *symbols* (verbatim in VC2M1N04.E04; *symbols* appears only in this teacher-facing note), *Think Board* (VC2M1N04.E04), *subitise* (VC2M1N04.E03), *ten-frame* (placed at Yr1 by the ladder itself), plus *number sentence*, *count on*, *count back*, *make ten*, all within the ceiling. No general word above Yr1 remains. The front matter and this Teacher note are teacher-facing metadata and are not vocabulary-gated (WORD_LEVEL_POLICY Rule 3). Cross-check with the whole-file build gate (`_pool/vocab_check.py`, ceiling Yr1, `--cds maths_1.json`) confirms: its only flag inside the student-facing region is *examples* in the heading “Worked examples”, an inflection of the curriculum word *example* (VC2M1N04.E02) missed by the gate’s literal-form exemption; all other build-gate flags sit in the teacher-facing front matter and Teacher note.

Modelling additive problems, including simple money transactions

Mathematics 1 · Level 1 · Chapter 2 — Number · Subtopic 2B. Teaching order: 7th of 15, after 2A.

Owens: VC2M1N05 — “use mathematical modelling to solve practical problems involving additive situations, including simple money transactions; represent the situations with diagrams, physical and virtual materials; use calculation strategies to solve the problem”. Quoted verbatim. Source: Victorian Curriculum F–10 Version 2.0, Mathematics (VCAA), Level 1, Number, VC2M1N05, via `maths_1.json` (VCAA export retrieved 2026-07-29).

Achievement standard (extract): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.” Quoted verbatim from the same source.

Elaborations drawn on: VC2M1N05.E01, .E02, .E03 — all three.

Linked bank: 192 MCQs keyed to VC2M1N05 — digital asset only, not printed (TOC D12).

All task wording is read aloud by the teacher; responses are a numeral, a drawing, cubes or play money, or a short number sentence (TOC D17). Student-facing text runs from “What we are learning” to “Answers”; the front matter above and the Teacher note at the end are for the teacher.

What we are learning

A **problem** is a story with a number we do not know. We read the story. We find the number. To **solve** a problem means to find that number.

Some stories join. Some stories take away.

- Join: 3 ducks are on the pond. 2 more ducks come. How many ducks are there now? We join with $+$. $3 + 2 = 5$.
- Take away: 5 ducks are on the pond. 2 ducks go away. How many ducks are left? We take away with $-$. $5 - 2 = 3$.



3 blue blocks and 2 green blocks. 5 blocks in all.



5 blocks. 3 blocks are left. 2 blocks have a red X on them.

Show a story three ways.

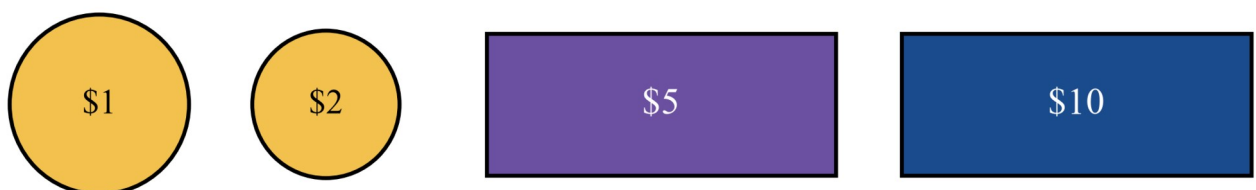
1. With things we touch: cubes and play money.
2. With a diagram. A **diagram** is a picture that shows the maths.
3. With a number sentence: numbers with $+$, $-$ and $=$.

A **Think Board** puts the parts together: the story, the cubes, the drawing and the number sentence. When all the parts say the same thing, we know our answer.

the story	the cubes
the drawing	the number sentence

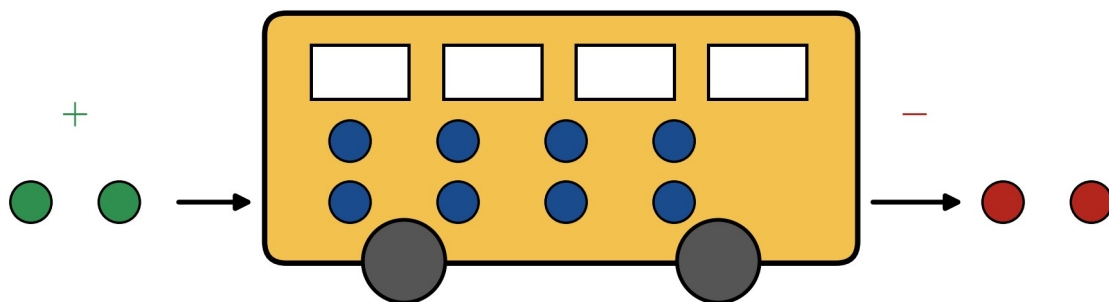
A Think Board with 4 parts: the story, the cubes, the drawing and the number sentence.

Money. We use money to buy things at a shop. We use dollars. A \$1 coin is 1 dollar. A \$2 coin is 2 dollars. A \$5 note is 5 dollars. A \$10 note is 10 dollars. The **price** of a thing is how much it costs.



A \$1 coin, a \$2 coin, a \$5 note and a \$10 note.

Counts that change. 8 children are on the bus. At a stop, some children get on. Some children get off. To **keep track** means to watch the count as it changes.



A bus with 8 children on it. Some children get on. Some children get off.

Example 1 — a join story on a Think Board

You need: cubes and paper.

What we do	Why
1. Read the story. Find the numbers: 8 ducks on the pond, then 5 more ducks come.	“More come” tells us to join.
2. Put out 8 cubes. Put out 5 more cubes.	The cubes stand for the ducks.
3. Draw the ducks: 8 ducks and 5 more ducks.	The drawing shows the story.
4. Write the number sentence: $8 + 5 = \square$	$+$ joins the two groups. $=$ tells how many in all.
5. Count on from 8: 9, 10, 11, 12, 13. So $8 + 5 = 13$.	We counted on 5.
6. Say it in words: “There are 13 ducks on the pond now.”	The cubes, the drawing and the number sentence all say the same thing.



A number line diagram illustrating a sequence of jumps. The number line has tick marks at 7, 8, 9, 10, 11, 12, 13, and 14. A blue dot is placed at 8, with the text "start here" above it. A red dot is placed at 13. Five curved arrows represent jumps of 1 unit each, starting from 8 and ending at 9, 10, 11, 12, and 13. The numbers 9, 10, 11, 12, and 13 are written above their respective arrows.

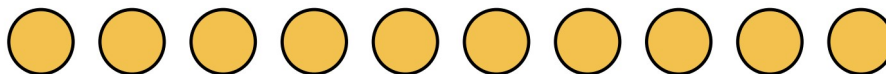
story 8 ducks on the pond. 5 more ducks come. cubes ■■■■■■■■■■ drawing ●●●●●●●●●●
sentence $8 + 5 = 13$

Example 2 — a money story with play money

You need: play money (\$1 coins) and paper.

What we do	Why
1. Show Mia's \$10 with play money: ten \$1 coins.	Ten \$1 coins make \$10.
2. The toy car costs \$4. Count out \$4 to pay: 1, 2, 3, 4.	Mia pays \$4.
3. Take the 4 coins away. Count the coins left: 1, 2, 3, 4, 5, 6.	\$6 is left.
4. Write the number sentence: $10 - 4 = 6$.	$-$ takes away.
5. Check: $6 + 4 = 10$. That is all of Mia's money. Say it in words: "Mia has \$6 left."	The \$6 left and the \$4 for the car make \$10.

start \$10



pay \$4



left \$6



Start with 10 coins. Pay 4 coins. 6 coins are left.

start \$10 •••••••••• pay \$4 •••• left \$6 •••••• sentence $10 - 4 = 6$

Now you try

With your teacher

Q1. 6 frogs are in the pond. 4 more frogs come. How many frogs are there now?

- (a) Use cubes. Show the 6 frogs. Show the 4 more frogs.
- (b) Draw the picture.
- (c) Write the number sentence: $6 + 4 = \square$
- (d) Say the story in words.

Q2. 9 biscuits are on a plate. Sam eats 3 biscuits. How many biscuits are left?

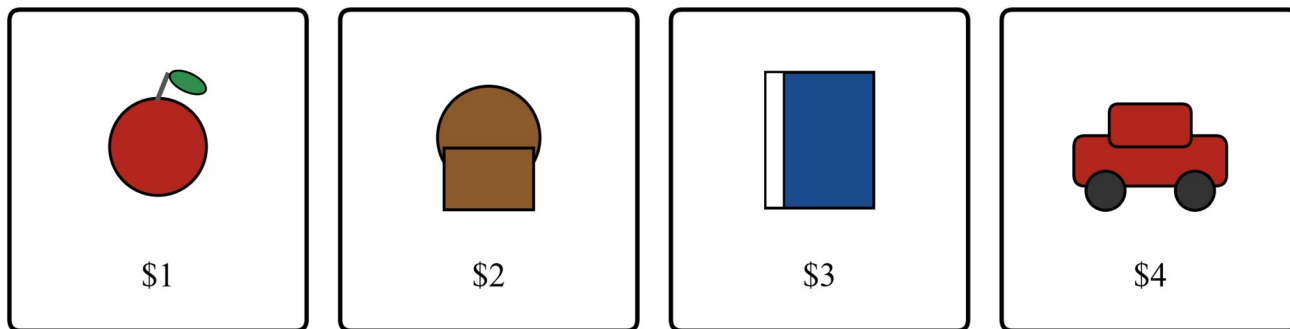
- (a) Use cubes. Show the 9 biscuits. Take away 3.
- (b) Write the number sentence: $9 - 3 = \square$
- (c) Say the story in words.

Q3. Zoe had \$7. She got \$6 for her birthday. How much money does Zoe have now?

- (a) Use play money. Show \$7. Add \$6 more.
- (b) Write the number sentence: $7 + 6 = \square$

Q4. Class shop.

apple \$1 muffin \$2 book \$3 toy car \$4



A shop. An apple is \$1, a muffin is \$2, a book is \$3 and a toy car is \$4.

Ben has \$5. He buys a book. How much money does Ben have left?

- (a) Use play money. Show \$5. Pay \$3.
- (b) Count the money left. Write the number sentence: $5 - 3 = \square$

Q5. 7 children are on the bus. At the stop, 4 children get on. How many children are on the bus now?

- (a) Use cubes for the children. Start with 7. Add 4 more.
- (b) Write the number sentence: $7 + 4 = \square$

Q6. 5 people are in the lift. 2 people get out. How many people are in the lift now?

- (a) Use cubes. Start with 5. Take away 2.
- (b) Write the number sentence: $5 - 2 = \square$

On your own

Q7. 4 red fish and 5 blue fish are in the water. How many fish are there in all?

Draw a picture. Write the number sentence.

Q8. Find the missing number. You can use cubes.

- (a) $6 + \square = 11$
- (b) $10 - \square = 4$
- (c) $8 + \square = 15$

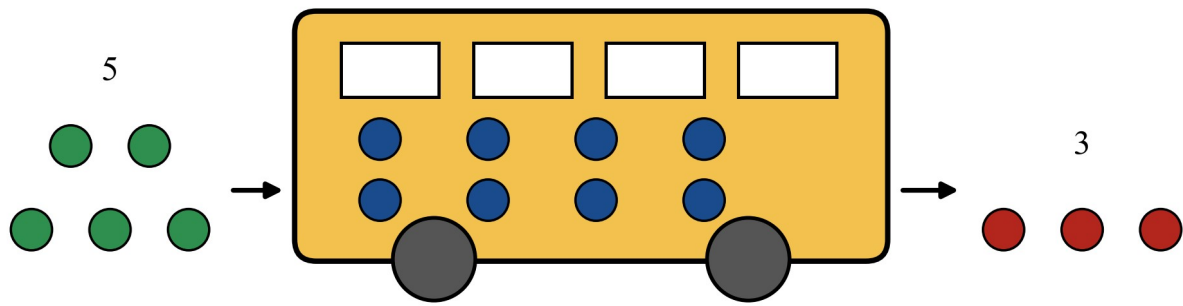
Q9. At the class shop, Tom buys a muffin and a book. Use the prices from Q4. How much does Tom pay in all?

Write the number sentence. Use play money to check.

Q10. Ava has \$10. She buys a ball for \$6. How much money does Ava have left?

Write the number sentence.

Q11. 8 children are on the bus. At the first stop, 5 children get on. At the next stop, 3 children get off. How many children are on the bus now?



A bus with 8 children on it. 5 children get on. 3 children get off.

Write a number sentence for each stop.

Q12. Draw a picture for this number sentence: $7 + 5 = 12$. Then tell the story.

Q13. Make up a story for $10 - 3 = \square$. Draw it. Use cubes to find the answer.

Q14. Noah says $7 + 6 = 12$. Is Noah right?

Use cubes or a drawing. Tell how you know.

Answers

Q1. (c) $6 + 4 = 10$. (d) There are 10 frogs now.

Q2. (b) $9 - 3 = 6$. (c) 6 biscuits are left.

Q3. (b) $7 + 6 = 13$. Zoe has \$13.

Q4. (b) $5 - 3 = 2$. Ben has \$2 left.

Q5. (b) $7 + 4 = 11$. 11 children are on the bus.

Q6. (b) $5 - 2 = 3$. 3 people are in the lift.

Q7. $4 + 5 = 9$.

Q8. (a) 5. (b) 6. (c) 7.

Q9. $2 + 3 = 5$. Tom pays \$5.

Q10. $10 - 6 = 4$. Ava has \$4 left.

Q11. $8 + 5 = 13$, then $13 - 3 = 10$. 10 children are on the bus.

Q12. Answers will not all be the same. Check: the picture shows 7 and 5 more, and 12 in all.

Q13. Answers will not all be the same. Check: the story takes away 3 from 10, and $10 - 3 = 7$.

Q14. No. $7 + 6 = 13$, not 12. Count on from 7: 8, 9, 10, 11, 12, 13.

Teacher note

Curriculum map. This subtopic owns VC2M1N05 in full (TOC §3, §4). The content description is delivered through story, money and tracking contexts built on 2A's calculation work, not through the elaborations one by one (D11): E01 (modelling addition and subtraction stories with materials and a Think Board, explaining the connections between the materials, the diagram and the numbers) → Example 1, Q1, Q2, Q7, Q8, Q12, Q13, Q14; E02 (simple money problems in whole dollar amounts, buying with play money, the birthday-money addition shape) → Example 2, Q3, Q4, Q9, Q10; E03 (keeping track of a changing count — people on a bus, people in a lift) → the “Counts that change” block, Q5, Q6, Q11. The CD's “represent the situations with diagrams, physical and virtual materials” is delivered by the cubes and play money and the drawn picture in every modelled and scaffolded task; where a device is available, a drawing tool or virtual money may stand in, and the mathematics is unchanged. “Use calculation strategies” is delivered by the count-on and count-back strategies taught in 2A; no new calculation is taught here and no written algorithm appears (D9).

Modelling is the point. 2A teaches adding and subtracting; 2B owns the modelling claim — a real story goes into maths and comes back out as an answer in the story's terms (TOC §3: 2B is additive modelling, distinct from 2A's calculation and from 2C's equal-sharing and grouping). Every task therefore asks for the story, the materials or picture, and the number sentence to agree, and Q12–Q14 run the model both ways (sentence → story, and checking someone else's model). Per TOC §7, checkpoint items for this CD score the strategy and the explanation, not only the answer: E01's “explaining the connections” is the reason the Why column and the “say it in words” steps are here.

Think Board. Used in the four-part sense fixed by 2A (story, cubes, drawing, number sentence), which is this book's operational definition of the term VCAA names in VC2M1N05 . E01 without defining (CONTESTED_TERMS Rule 1).

Ranges and money (D8). Every total and every difference in this section stays within 20; the largest total is \$13 (Q3) and 13 (Q11). All money amounts are whole dollars (D8, VC2M1N05 . E02); no cents appear anywhere in this section. VCAA's illustration for E02 (“I had \$14 and was given \$15”) adds past 20; elaborations are illustrations, not requirements (D11), so this section keeps every money story within the book's hard cap. Coin skip counting (5c, 10c, \$2 coins, \$5 and \$10 notes) belongs to 3B (VC2M1A01 . E04) and is not done here.

Currency facts. The coins and notes named are real Australian currency (TOC §6): \$1 and \$2 coins, \$5 and \$10 notes. Source: Royal Australian Mint, *Circulating coins*, retrieved 2026-08-19 — circulating coins are 5c, 10c, 20c, 50c, \$1 and \$2; 1c and 2c coins were withdrawn from circulation in 1992 and appear nowhere in this book. Banknotes: Reserve Bank of Australia, *Banknotes* (rba.gov.au/banknotes), confirmed 2026-08-19 — \$5, \$10, \$20, \$50 and \$100. Class-shop prices (Q4, Q9) are set for the task, not claims about real prices; all other story details are invented, and children’s given names are invented as permitted (TOC §6).

Symbols, not algorithms (D9). +, – and = are the only operation symbols used; they were introduced in 2A (VC2M1N04.E04) and are used here to record the models. The minus sign is printed as – (U+2212), never a hyphen (TOC §6). No vertical algorithm appears. The balance reading of = from 2A is kept: Q8 and Q14 use = with the unknown on either side.

Materials. Cubes (unifix/centi-cubes or other connecting cubes) or counters; play money — \$1 and \$2 coins, \$5 and \$10 notes; Think Board templates (a sheet ruled into the 4 parts named in 2A); paper; whiteboards and markers. Where devices are available, virtual money or a drawing tool may stand in for the physical materials — the CD names “physical and virtual materials” — and the mathematics is unchanged.

Assumed Foundation skills, rehearsed only (D3): representing practical additive situations (VC2MFN05) and part–whole to 10 (VC2MFN04) — rehearsed in the opening join and take-away stories, not taught as new and not assessed as Foundation outcomes.

Also drawn on (already taught, in the recommended sequence): addition and subtraction within 20, count on / count back, +, –, =, number sentences and the Think Board — all from 2A (VC2M1N04), taught immediately before this subtopic (D5). 2B uses them and teaches no new calculation.

Level 2 destinations (named only, not taught — D3): VC2M2N04 (one- and two-digit addition and subtraction with number sentences) extends the modelling and number-sentence work done here. The whole-dollar money work is the first rung of the financial chain described in TOC §5 (money-as-quantity here → consumer arithmetic in 9–10 → FM AoS3).

Assessment. Chapter checkpoint T2 (18 marks across VC2M1N04 + VC2M1N05 + VC2M1N06, 6 per CD): teacher-read, with counters, ten-frames and play money supplied, number sentences using +, –, = recorded (TOC §7).

Data note. Every number in the student-facing tasks is invented for the task; no external datum is asserted beyond the currency facts above, which carry their source lines. No metric units (D7), no chance language (D6), no clock faces, no fractions.

Vocabulary gate record (DJB 2026-08-18). Student-facing text — everything from “What we are learning” to “Answers” — is at or below the Yr1 ladder ceiling (rank 1), verified with `load_ladder/check_text/tokenize` from `S:\Files\projects\mcq-system\reports\vocab_level_check.py`. Result: CLEAN. Curriculum-exempt words retained per `VOCABULARY_LEVEL.md` exemption 1, each defined at first use where student-facing: *modelling*, *additive*, *transactions* (heading only, fixed by the TOC section title; all three verbatim in the VC2M1N05 content description), *problem* and *solve* (content description), *diagram* (content description and VC2M1N05.E01), *example(s)* (verbatim in VC2M1N05.E02 and .E03; student-facing only in the structural heading “Worked examples”), *price/prices* (VC2M1N05.E02), *track* in *keep track* (VC2M1N05.E03), plus *Think Board*, *number sentence* and *count on*, all within the ceiling and already introduced in 2A. No general word above Yr1 remains. The pandoc div fence lines (`::: {custom-style="Source Code"}`) are markup, not prose, and are excluded from the checked text. The children’s names (Mia, Zoe, Ben, Noah, Sam, Ava, Tom) are proper nouns (exemption 3), chosen from the names that passed the 2A gate. The front matter and this Teacher note are teacher-facing metadata and are not vocabulary-gated (WORD_LEVEL_POLICY Rule 3). Cross-check with the whole-file build gate (`_pool/vocab_check.py`, ceiling Yr1, `--cds maths_1.json`) confirms: its only flags inside the student-facing region are *examples* in the heading “Worked examples” and *price* in the first-use definition, inflections of the curriculum words *example* (VC2M1N05.E02/.E03) and *prices* (VC2M1N05.E02) missed by the gate’s literal-form exemption; all other build-gate flags sit in the teacher-facing front matter and Teacher note.

Modelling equal sharing and grouping problems

Mathematics 1 · Level 1 · Chapter 2 — Number · Subtopic 2C. Teaching order: 8th of 15, after 2B, before 4A (TOC D5).

Owens: VC2M1N06 — “use mathematical modelling to solve practical problems involving equal sharing and grouping; represent the situations with diagrams, physical and virtual materials, and use calculation strategies to solve the problem”. Quoted verbatim. Source: Victorian Curriculum F–10 Version 2.0, Mathematics (VCAA), Level 1, Number, VC2M1N06, via maths_1.json (VCAA export retrieved 2026-07-29).

Achievement standard (extract): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.” Quoted verbatim from the same source. This extract is shared with 2A and 2B (TOC §3); 2C delivers the equal sharing and grouping clause.

Elaborations drawn on: VC2M1N06.E01, .E02, .E03 — all three.

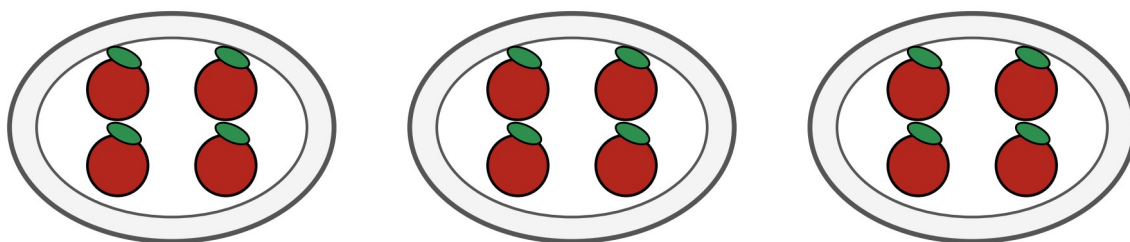
Linked bank: 144 MCQs keyed to VC2M1N06 — digital asset only, not printed (TOC D12).

All task wording is read aloud by the teacher; responses are a numeral, a drawing or a short sentence (TOC D17). Student-facing text runs from “What we are learning” to “Answers”; the front matter above and the Teacher note at the end are for the teacher.

What we are learning

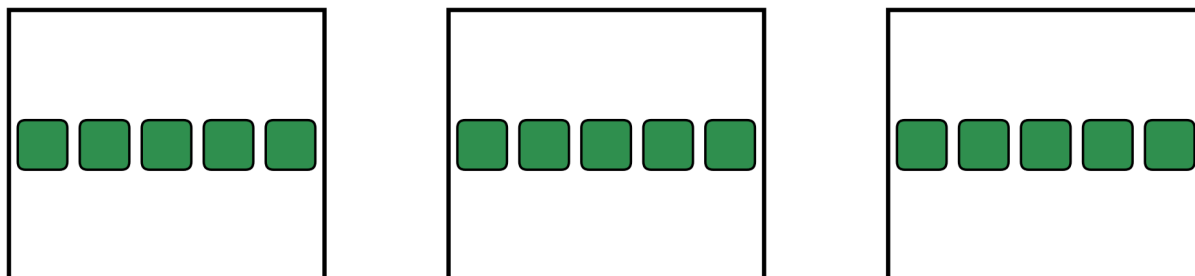
Sometimes we give things out. Sometimes we make groups.

Equal sharing means each one gets the same. 12 strawberries on 3 plates. Each plate gets 4. That is equal.



12 strawberries on 3 plates. Each plate has 4.

Equal groups means each group has the same number. 5 stickers on each page. Each page has 5. That is equal.



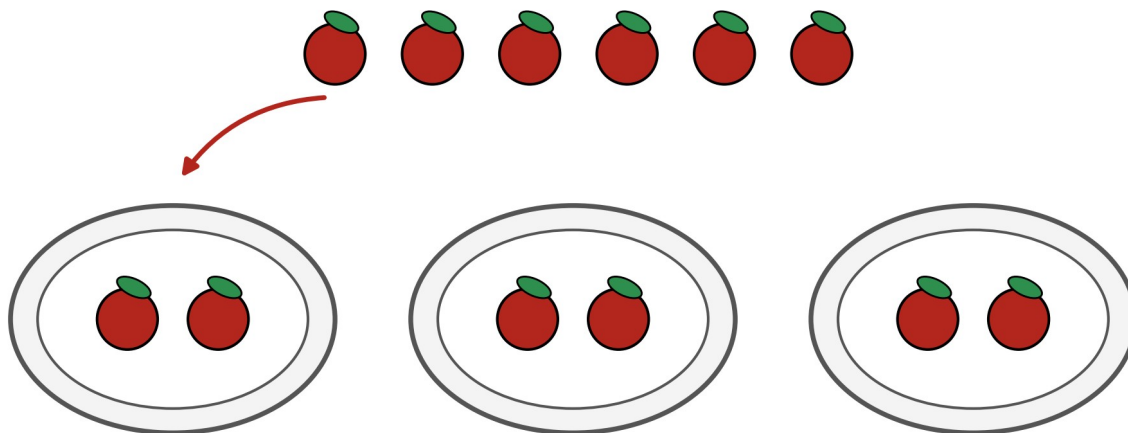
3 pages. 5 stickers on each page. That is equal.

New words:

- **equal** (say: ee-kwul) means the same. Equal sharing is the same on each plate.

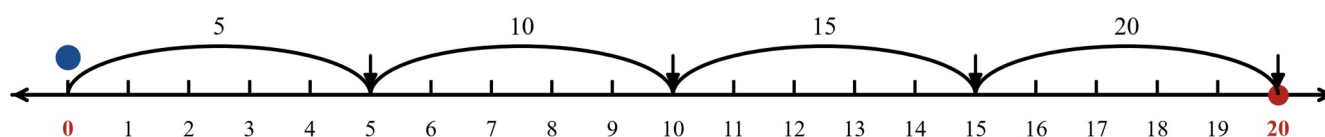
- **sharing** means giving things out so each one gets the same.
- **each** means every one, one at a time. Each plate has 4. That means plate 1 has 4, plate 2 has 4 and plate 3 has 4.
- A **group** is things put together. A group of 5 has 5 things in it.

What is sharing? We can give out one at a time. One for this plate, one for that plate, one for that plate. Round and round. All the things are gone, and each plate has the same.



Give out one at a time. One for each plate, round and round.

How do we count equal groups? We can skip count by 2, by 5 or by 10. We can count them all, one by one. We can draw a picture to show the groups.



A number line from 0 to 20. Count by 5: 5, 10, 15, 20.

Worked examples

Example 1 — equal sharing, with plates and cubes

Question: Ben has 12 strawberries. He puts them on 3 plates. Each plate gets the same. How many strawberries are on each plate?

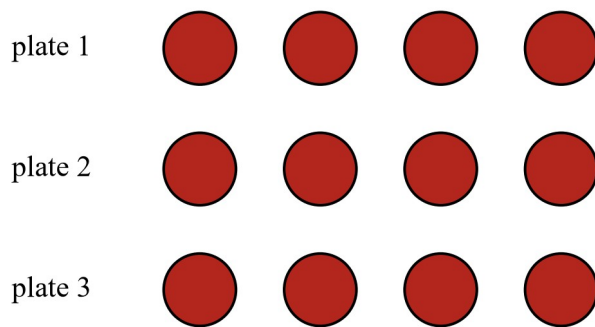
You need: 12 cubes and 3 paper plates.

What we do

Why

1. Put out 3 plates.
 2. Put 1 cube on each plate. Round and round.
 3. Keep going. All 12 cubes are out.
 4. Count 1 plate: 1, 2, 3, 4.
 5. Draw it. Each • is 1 strawberry.
 6. Check: $4 + 4 + 4 = 12$. That is all 12.
- plate 1 • • • • plate 2 • • • • plate 3 • • • •

The strawberries make 3 groups.
One at a time keeps the plates the same.
All 12 strawberries are on the plates.
Each plate has 4 strawberries.
The picture shows what we did.
Each plate gets the same.



Each dot is 1 strawberry. 3 plates with 4 on each plate.

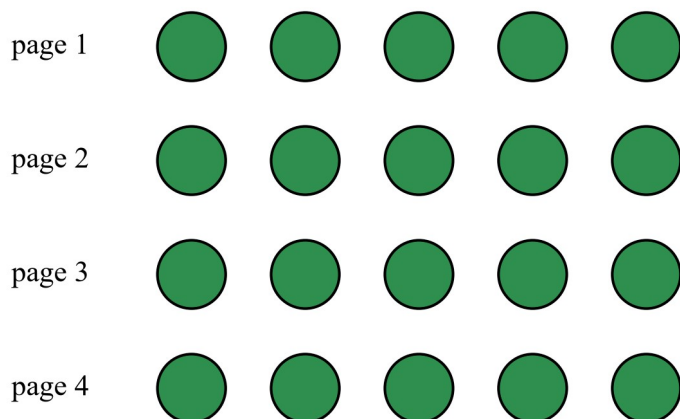
Each plate has 4 strawberries.

Example 2 — equal groups, counting by 5

Question: Mia has 20 stickers. She puts 5 stickers on each page of her book. How many pages does she need?

You need: 20 cubes and paper.

What we do	Why
1. Get 20 cubes.	The cubes are the stickers.
2. Push 5 cubes together. That is 1 group.	1 group of 5 is 1 page.
3. Make more groups of 5. Count by 5: 5, 10, 15, 20.	Skip counting tells us when to stop.
4. Count the groups: 1, 2, 3, 4 groups.	4 groups means 4 pages.
5. Draw the groups. Each row is 1 page.	The picture shows what we did.
6. Check: $5 + 5 + 5 + 5 = 20$. That is all 20.	Each page has 5 stickers.
page 1 ● ● ● ● ● page 2 ● ● ● ● ● page 3 ● ● ● ● ● page 4 ● ● ● ● ●	



Each dot is 1 sticker. 4 pages with 5 on each page.

Mia needs 4 pages.

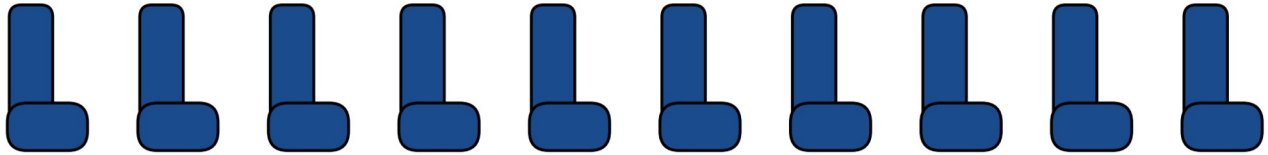
Now you try

With your teacher

Q1. Biscuits on plates. There are 8 biscuits. Put them on 2 plates. Put 1 on each plate, round and round. Draw the plates. How many biscuits are on each plate?

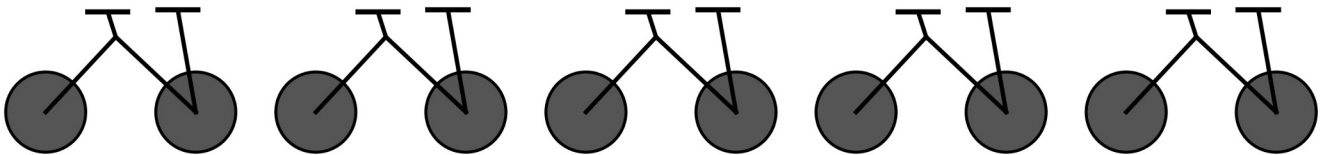
Q2. Grapes in cups. There are 15 grapes. Put them into 3 cups. Use cubes. How many grapes are in each cup?

Q3. Socks in pairs. There are 10 socks. Circle groups of 2. Each group of 2 is a pair. How many pairs are there?



10 socks. Circle groups of 2.

Q4. Bike wheels. There are 5 bikes. Each bike has 2 wheels. Count by 2 as you go: 2, , , , . How many wheels in all?



5 bikes. Each bike has 2 wheels.

Q5. Sorting and sharing coins. There are 10 coins: 6 \$1 coins and 4 \$2 coins.



10 coins: 6 \$1 coins and 4 \$2 coins.

- (a) Make 2 groups: all the \$1 coins together, and all the \$2 coins together.
- (b) Give the \$1 coins to 2 children. Each child gets the same. How many \$1 coins does each child get?
- (c) Give the \$2 coins to 2 children. Each child gets the same. How many \$2 coins does each child get?

Q6. Equal or not? Plate 1 has 2 strawberries. Plate 2 has 3 strawberries. Plate 3 has 4 strawberries.

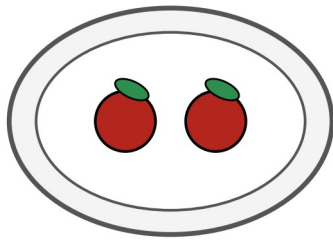


plate 1

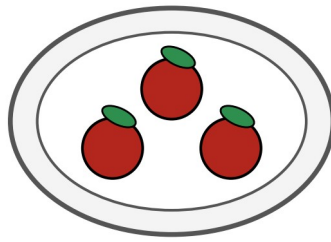


plate 2

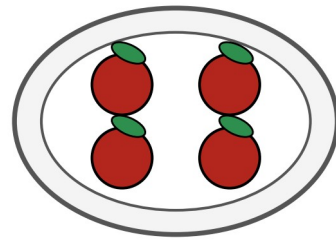


plate 3

Plate 1 has 2 strawberries. Plate 2 has 3 strawberries. Plate 3 has 4 strawberries.

- (a) Are the plates equal?
- (b) Fix it. Draw the plates. How many on each plate?

On your own

Q7. 16 shells are for 4 friends. Each friend gets the same. Draw it. How many shells does each friend get?

Q8. 18 beads go into 2 boxes. Each box gets the same. How many beads are in each box?

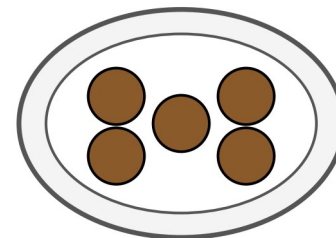
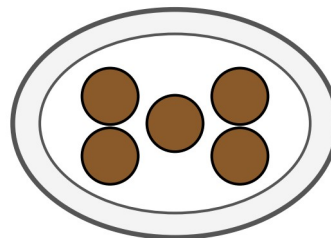
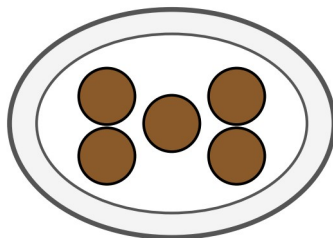
Q9. There are 12 pencils. Put 3 pencils in each cup. How many cups do you need? Draw the groups.

Q10. There are 5 dogs. Each dog has 4 legs. How many legs in all? Draw the dogs and count the legs.

Q11. There are 12 \$2 coins. They are for 4 children. Each child gets the same. How many coins does each child get?

Q12. You have 20 buttons. Make equal groups with all 20 buttons. How many ways can you do it? Draw 2 ways. Tell a friend about them.

Q13. Look at the picture. Tell the story. How many biscuits in all?



3 plates with biscuits. How many biscuits in all?

plate 1 ••••• plate 2 ••••• plate 3 •••••

Q14. Tom puts 10 apples on 2 plates. He puts 6 on one plate and 4 on the other plate.

- (a) Are the plates equal?
- (b) Fix it. How many apples on each plate?

Answers

Q1. 4 biscuits on each plate.

Q2. 5 grapes in each cup.

Q3. 5 pairs.

Q4. 2, 4, 6, 8, 10 — 10 wheels in all.

Q5. (b) 3 \$1 coins each. (c) 2 \$2 coins each.

Q6. (a) No. (b) 3 on each plate. Move 1 strawberry from plate 3 to plate 1.

Q7. 4 shells each.

Q8. 9 beads in each box.

Q9. 4 cups.

Q10. 20 legs. Count: 4, 8, 12, 16, 20.

Q11. 3 coins each.

Q12. Answers will not all be the same. Ways to make equal groups: 10 groups of 2, 5 groups of 4, 4 groups of 5, 2 groups of 10. Check: each group has the same number, and all 20 buttons are used.

Q13. 3 plates, 5 biscuits on each plate. Count by 5: 5, 10, 15 — 15 biscuits in all.

Q14. (a) No. (b) 5 on each plate. Move 1 apple from the plate with 6 to the plate with 4.

Teacher note

Teaching sequence (three short lessons, built on materials — TOC §3 volume calibration). (1) *Sharing by dealing*: counters and paper plates; introduce *equal*, *same*, *each*; students give out one at a time, draw the share and record the number (Example 1; Q1, Q2). (2) *Equal grouping*: counters and cups; ask “how many groups of 5?”; students make equal groups, skip count by 2, 5 and 10 (from 3B, VC2M1A01), draw rows and record the number and the repeated addition (Example 2; Q3, Q4, Q9). (3) *Both problem types, plus coins*: sort play money by denomination and share it equally (Q5, Q11); tell a story from a picture (Q13); judge and fix an unequal share (Q6, Q14). Consolidate with the On-your-own tasks; most responses are drawings and numerals, with talk where marked.

Curriculum map. This subtopic owns VC2M1N06 in full (TOC §3, §4). The content description is delivered through invented class contexts built on materials, not through the elaborations one by one (D11): E01 (repeated equal group situations, materials, a picture, and recording with a number) → Example 2, Q3, Q4, Q9, Q10, Q13 — with sticker pages, socks, bikes, pencils, dogs and plates of biscuits standing in for VCAA’s wheels-on-cars scenario; E02 (equal sharing situations, counting to check the shares are the same) → Example 1, Q1, Q2, Q6, Q7, Q8, Q14 — with plates, cups and boxes standing in for VCAA’s dominoes-between-two-players scenario; E03 (money problems: sort coins by denomination, share equally, count to check) → Q5, Q11 — with class play coins, not VCAA’s moneybox scenario. The CD’s “represent the situations with diagrams, physical and virtual materials” is delivered by the drawing step in both examples and most tasks (diagrams), the “You need” materials lists (physical), and the device option below (virtual); “use calculation strategies” is delivered by dealing one at a time, skip counting by 2, 5 and 10 (from 3B), counting all, and repeated addition with + and = only (D9).

Virtual materials. The CD names physical and virtual materials. Tasks here are device-neutral; where a device is available, any dealing or grouping (Example 1, Q1, Q7, Q9, Q12) may instead be done with objects in a simple drawing app, and the mathematics is unchanged.

Materials. Counters; paper plates; cups; play coins (\$1, \$2); buttons; socks or sock cards for Q3; paper; pencils; whiteboard and markers.

Assumed Foundation skill, rehearsed only: representing practical situations that involve equal sharing and grouping (VC2MFN06) — rehearsed in the opening dealing and grouping steps, not taught as new and not assessed as a Level 1 outcome (D3).

Also drawn on (already taught, in the recommended sequence): skip counting by 2, 5 and 10 — 3B (VC2M1A01), used to count equal groups; + and = and addition within 20 — 2A (VC2M1N04), used in the check steps; equal groups also echo quantifying by equal groups from 1C (VC2M1N03). No new calculation method is taught here; no subtraction is needed in this subtopic.

Level 2 destination (named only, not taught — D3): multiplication and division (VC2M2N05). Equal sharing and grouping is the root of division and is assessed as its own claim (TOC §3, Chapter 2 note). No multiplication or division symbol appears anywhere in the student-facing text (D9).

Assessment. Chapter checkpoint T2 (18 marks across VC2M1N04 + VC2M1N05 + VC2M1N06): teacher-read; counters, ten-frames and play money supplied; number sentences using +, −, = recorded (TOC §7). Within T2, the equal-sharing-and-grouping items score the strategy and the explanation, not only the answer (TOC §7).

Data note. Every collection in this section is an invented class context constructed for the example or task (strawberries, biscuits, grapes, socks, bikes, coins, shells, beads, pencils, dogs, buttons, apples), and the children’s names (Ben, Mia, Tom) are invented, which is fine (TOC §6). Everyday objects are used as generic objects, so no external datum is asserted and no source line is required beyond the curriculum quotation in the front matter (TOC §6). All numbers stay within the Level 1 ranges: totals to 20 and addition within 20 (D8), operation symbols limited to + and = (D9), no fractions (Level 2 VC2M2N03, D3), no metric units (D7), no chance language (D6). No Aboriginal and Torres Strait Islander content is used (CONTENT_POLICY Rule 1, DJB 2026-08-15).

Vocabulary gate record (DJB 2026-08-18). Student-facing text — everything from “What we are learning” to “Answers” — is at or below the Yr1 ladder ceiling (rank 1), verified with `load_ladder/check_text/tokenize` from `S:\Files\projects\mcq-system\reports\vocab_level_check.py` (conservative min-placement lookup; the checker reads its own DB credentials). **Result: CLEAN — zero violations** after the curriculum exemption. The exemption set is every word of the content descriptions and elaborations of all 15 CDs in `maths_1.json` — the book-level `--cds` set (VOCABULARY_LEVEL.md exemption 1; WORD_LEVEL_POLICY Rule 2). Words retained under that exemption although the ladder places them above Yr1: *sharing* (Yr2; verbatim in VC2M1N06), *example/examples* (Yr3; verbatim in VC2M1N06.E02, .E03), *question* (Yr2; verbatim in VC2M1ST01.E01, .E02 and VC2M1ST02.E02, same book-level set). Words swapped during authoring to sit at or below Yr1 (meaning and mathematical content unchanged): *share/shares/shared* → *give (out)*, *put*, or the curriculum word *sharing*; *counters* → *cubes* as the student-facing material (counters remain in the teacher-facing materials list); *onto* → *on*; *sort* → *sorting* (the curriculum’s own word, VC2M1N06.E03); *none* dropped, with “That is all 12/20” carrying the check; the given name *Ruby* (homograph of the common noun placed Yr2) → *Ben*. Two tokens are unplaced on the ladder, which is not a violation: *ee-kwul* (pronunciation guide, same convention as 6B’s “pik-toh-graf”) and *why* (table column header). Pandoc fence markers (`::: {custom-style=...}`) are markup and stripped before checking; the diagram text inside the fences is checked. The front matter and this Teacher note are teacher-facing metadata and are not vocabulary-gated (WORD_LEVEL_POLICY Rule 3).

Checkpoint CP2

Mathematics 1 · Level 1 · Chapter 2 — Number · Checkpoint CP2. Chapter 2's topic checkpoint, row T2 of TOC §7. Run after subtopics 2A, 2B and 2C.

CDs scored: VC2M1N04, VC2M1N05, VC2M1N06 — 6 marks per CD, **18 marks** (TOC §7: each chapter carries one checkpoint, worth 6 marks per CD the chapter owns).

Achievement standard (extract): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.” Quoted verbatim — this one extract is carried in the authority file for all three CDs scored here (TOC §3: 2A, 2B and 2C share one achievement-standard sentence). Source: Victorian Curriculum F–10 Version 2.0, Mathematics (VCAA), Level 1, Number, via `maths_1.json` (VCAA export retrieved 2026-07-29).

Administration (TOC §7, row T2, stated as given): teacher-read; counters, ten-frames and play money supplied; number sentences using $+$, $-$, $=$ recorded. **This is an observed checkpoint:** the model, strategy and reasoning marks are awarded while students work, from what the teacher sees on the desk and hears.

Timing: untimed — there is no time limit, no timed paper and no exam at Level 1 (TOC §7, D17). Run in one short session.

Equipment: counters, ten-frames and play money supplied (TOC §7, row T2), plus paper and pencils. The student-facing text names the counters *cubes*, the student-facing material of 2A–2C.

Calculator: none — there is no calculator anywhere in this book (TOC §7, D17).

Student-facing text runs from “Get ready” to the end of Q7; the mark values are not printed in the student-facing region. The Solutions and Marking guide sections are for the teacher.

Get ready

Words we know:

- A **number sentence** writes a story with numbers and signs: $8 + 5 = 13$. $+$ means add. $-$ means take away. $=$ means the two sides are the same.
- A **ten-frame** is 2 rows of 5 boxes. We put one cube in each box.
- The **price** of a thing is how much it costs.
- **Equal** means the same.

Your teacher reads each question. You can use the things on your desk. You can draw. You can write number sentences. Take your time.

On your desk: cubes, 2 ten-frames, play money (\$1 coins, \$2 coins, \$5 notes and \$10 notes), paper and a pencil.

Adding and taking away

Q1. Use your ten-frames and cubes.

$$7 + 6 = \square$$

- (a) Show $7 + 6$ on your ten-frames. Move cubes to help you find the answer.
- (b) Write the number sentence.

Q2. 15 ducks are on the pond. 7 ducks go away. How many ducks are left?

- (a) Show the story. Use cubes or a drawing.
- (b) Write the number sentence.

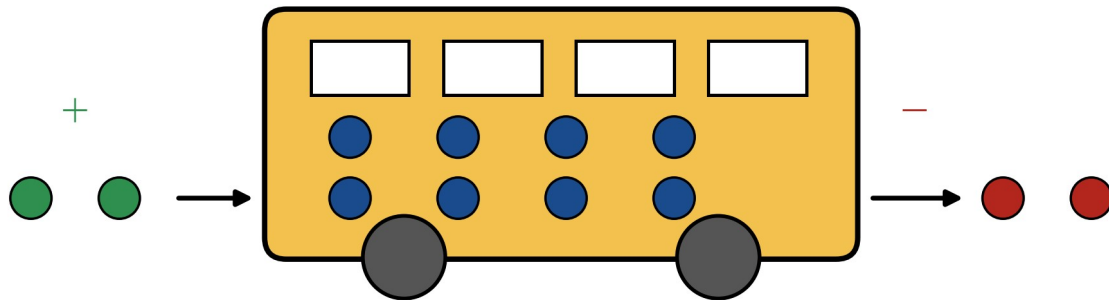
Q3. The $=$ means the two sides are the same.

$$8 + 5 = 10 + \square$$

- Find the number for the box.
- Show or tell how you know both sides are the same.

Stories and money

Q4. 9 children are on the bus. At the stop, 5 more children get on. How many children are on the bus now?

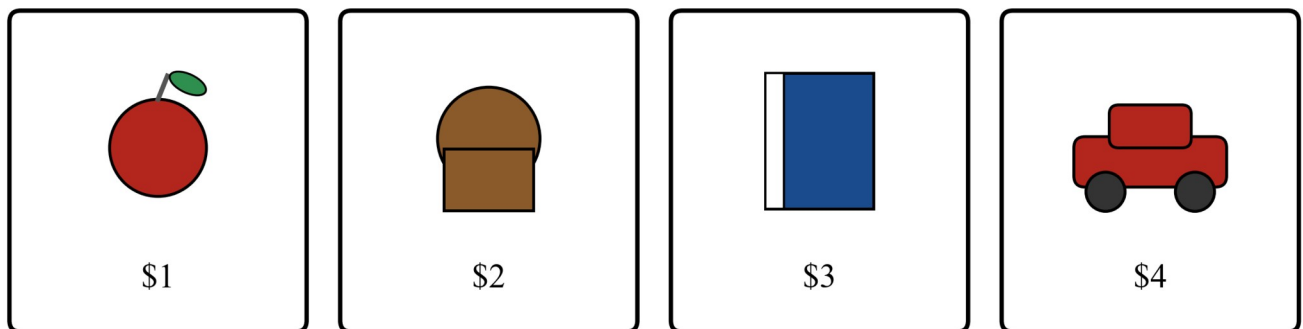


A bus with 8 children on it. Some children get on. Some children get off.

- Show the story with cubes or a drawing.
- Find the answer. Show or tell how you worked it out.
- Write the number sentence.

Q5. At the class shop:

apple \$1 muffin \$2 book \$3 toy car \$4



A shop. An apple is \$1, a muffin is \$2, a book is \$3 and a toy car is \$4.

Tom has \$10. He buys a toy car. How much money does Tom have left?

- Use play money. Show \$10. Pay for the toy car.
- How much money is left? Show or tell how you know.
- Write the number sentence.

Sharing and groups

Q6. There are 15 grapes. Put them into 3 cups. Each cup gets the same. How many grapes are in each cup?

- (a) Give out the grapes one at a time. Use cubes. Draw the 3 cups.
- (b) How many grapes are in each cup?
- (c) Check the cups are the same. Show or tell how you checked.

Q7. There are 3 toy cars. Each toy car has 4 wheels. How many wheels in all?

- (a) Draw the cars and the wheels, or use cubes for the wheels.
- (b) How many wheels in all?
- (c) Write the answer. You can write a number sentence.

Solutions

Expected answers and acceptable evidence. Mark values and criteria are in the Marking guide.

Q1. (a) The ten-frames show 7 cubes and 6 cubes. Strategy seen: make ten — move 3 cubes to fill the first ten-frame, so $7 + 6 = 7 + 3 + 3 = 10 + 3 = 13$; or count on from 7: 8, 9, 10, 11, 12, 13. The answer is 13. (b) $7 + 6 = 13$. Accept a make-ten chain: $7 + 6 = 7 + 3 + 3 = 10 + 3 = 13$, or $7 + 3 = 10$, $10 + 3 = 13$.

Q2. (a) 15 shown (a full ten-frame and 5 more, or a drawing of 15 ducks), then 7 taken away or marked. Strategy seen: count back from 15; take away to make 10 ($15 - 5 = 10$, then $10 - 2 = 8$); count on from 7 to 15; or a known fact. The answer is 8. (b) $15 - 7 = 8$. Accept a related addition sentence such as $7 + 8 = 15$ with 8 named as the ducks left.

Q3. (a) 3, so $8 + 5 = 10 + 3$. (b) Both sides shown as 13: ten-frames or cubes show 8 and 5 is 13 and 10 and 3 is 13; or told: “8 and 5 is 13. 10 needs 3 more to be 13.”

Q4. (a) 9 cubes and 5 more cubes, or a drawing of 9 children and 5 more getting on. (b) 14. Strategy seen or told: count on from 9 (10, 11, 12, 13, 14); make ten ($9 + 1 = 10$, $10 + 4 = 14$); or count all. (c) $9 + 5 = 14$.

Q5. (a) \$10 shown with play money (ten \$1 coins; or a \$5 note and five \$1 coins; or two \$5 notes), then \$4 counted out to pay. (b) \$6 left. Count the coins left, or 10 take away 4; the check $6 + 4 = 10$ also shows it. (c) $10 - 4 = 6$. Accept “Tom has \$6 left” written with the number sentence.

Q6. (a) Cubes given out one at a time into 3 cups until all 15 are gone; or a drawing of 3 cups with the grapes shared out. (b) 5 grapes in each cup. (c) The check: count or subitise each cup — 5, 5, 5; or $5 + 5 + 5 = 15$, so all 15 are there and the cups are the same.

Q7. (a) 3 cars, each with 4 wheels — drawn, or 3 groups of 4 cubes. (b) 12 wheels. Count all, or count by 4s: 4, 8, 12. (c) 12. Accept the number sentence $4 + 4 + 4 = 12$.

Marking guide

18 marks — 6 marks per CD (TOC §7). The rubric below is written in the language of the achievement-standard extract carried in the authority file for each CD scored, quoted verbatim beside each CD block.

Achievement-standard extract (all three CDs scored here — TOC §3: 2A, 2B and 2C share one achievement-standard sentence): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.” Source: Victorian Curriculum F–10 Version 2.0, Mathematics (VCAA), Level 1, Number, VC2M1N04, VC2M1N05, VC2M1N06, via `maths_1.json` (VCAA export retrieved 2026-07-29).

How to run and mark this checkpoint.

- Teacher-read: read each question aloud; read it again if asked. Point to each part as you read it (TOC §7, D17).
- Materials on the desk throughout: counters, ten-frames and play money supplied, plus paper and pencils (TOC §7, row T2).
- Untimed — no time limit; this is a classroom checkpoint, not an exam (TOC §7, D17). No calculator (TOC §7, D17).
- This is an observed checkpoint: award the model, strategy and reasoning marks from what you see and hear while students work. Pointing at materials counts as showing; words are not required (D17).
- Part marks are independent — add them to a score out of 18.
- Strategy and reasoning marks are awarded for the strategy or the explanation shown, even where the final number is wrong; recording marks need the correct number.
- Prompts are allowed and do not lose a mark: “Show me”, “How did you work it out?” — where a part asks for a strategy that is not yet visible, ask, and award on the response.
- Any strategy taught in 2A is acceptable — count on, count back, make ten, take away to make ten, known facts. The CD says “a variety of calculation strategies”; no one method is required.
- Recording uses +, −, = only (D9). No $\times$ or $\div$ symbol may appear; repeated addition such as $4 + 4 + 4 = 12$ is acceptable. The minus sign is the proper − (U+2212), as introduced in 2A (VC2M1N04.E04).

VC2M1N04 — add and subtract numbers within 20 (Q1–Q3, 6 marks)

Content description (verbatim): “add and subtract numbers within 20, using physical and virtual materials, part-whole knowledge to 10 and a variety of calculation strategies”.

Achievement-standard extract (verbatim): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.”

Part	Marks	Award the mark when the student ...	Accept
Q1(a)	1	... solves a problem involving addition of numbers to 20, with a calculation strategy seen on the materials.	7 cubes and 6 cubes shown on the ten-frames, and a move or count seen: make ten (cubes moved to fill a frame), or count on from 7. The correct total is not needed for this mark.
Q1(b)	1	... records the answer as a number sentence using + and =.	$7 + 6 = 13$; a make-ten chain ($7 + 6 = 7 + 3 + 3 = 10 + 3 = 13$, or $7 + 3 = 10$, $10 + 3 = 13$).
Q2(a)	1	... solves a problem	15 shown and 7 taken

Part	Marks	Award the mark when the student ...	Accept
		involving subtraction of numbers to 20, with a strategy seen on the materials or the drawing.	away or marked; count back, take away to make ten, count on from 7 to 15, or a known fact. The correct difference is not needed for this mark.
Q2(b)	1	... records the difference as a number sentence using – and =.	$15 - 7 = 8$; a related addition sentence ($7 + 8 = 15$) with 8 named as the answer.
Q3(a)	1	... finds the missing number.	3, so $8 + 5 = 10 + 3$.
Q3(b)	1	Reasoning: ... shows or tells that the two sides of = are the same.	Ten-frames or cubes show both sides as 13; or told: “8 and 5 is 13. 10 needs 3 more to be 13.” This is the balance reading of = taught in 2A (TOC §5 item 7); the missing number alone, with nothing shown or told, does not earn this mark.

VC2M1N05 — modelling additive problems, including simple money transactions (Q4–Q5, 6 marks)

Content description (verbatim): “use mathematical modelling to solve practical problems involving additive situations, including simple money transactions; represent the situations with diagrams, physical and virtual materials; use calculation strategies to solve the problem”.

Achievement-standard extract (verbatim): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.”

Part	Marks	Award the mark when the student ...	Accept
Q4(a)	1	... uses mathematical modelling : the practical problem is represented with materials or a diagram.	9 cubes and 5 more cubes; or a drawing of 9 children and 5 more getting on the bus.
Q4(b)	1	... uses a calculation strategy to solve the problem, and shows or tells it.	14, with count on from 9, make ten ($9 + 1 = 10$, $10 + 4 = 14$), or count all — seen on the materials or told. If the answer is right but no strategy is visible yet, ask “How did you work it out?” and award on the response.
Q4(c)	1	... records the answer as a number sentence.	$9 + 5 = 14$.

Part	Marks	Award the mark when the student ...	Accept
Q5(a)	1	... models a simple money transaction with materials.	\$10 made with play money (ten \$1 coins; a \$5 note and five \$1 coins; two \$5 notes), then \$4 counted out to pay.
Q5(b)	1	... uses a calculation strategy to solve the money problem, and shows or tells it.	\$6 left: counting the coins left, 10 take away 4, or the check $6 + 4 = 10$.
Q5(c)	1	... records the answer as a number sentence.	$10 - 4 = 6$; accept “Tom has \$6 left” written with the number sentence.

Why Q4(b) and Q5(b) are scored this way. VC2M1N05.E01 asks for “explaining the connections between any materials used, the Think Board diagram and the numbers within the story”, and TOC §7 directs that items “score the strategy and the explanation, not only the answer”. A correct total with no strategy shown or told does not earn the (b) marks.

VC2M1N06 — modelling equal sharing and grouping (Q6–Q7, 6 marks)

Content description (verbatim): “use mathematical modelling to solve practical problems involving equal sharing and grouping; represent the situations with diagrams, physical and virtual materials, and use calculation strategies to solve the problem”.

Achievement-standard extract (verbatim): “They solve problems involving addition and subtraction of numbers to 20 and use mathematical modelling to solve practical problems involving addition, subtraction, equal sharing and grouping, using calculation strategies.”

Part	Marks	Award the mark when the student ...	Accept
Q6(a)	1	... models an equal sharing situation with materials or a diagram.	Cubes given out one at a time into 3 cups until all 15 are gone; or a drawing of 3 cups with the grapes shared out.
Q6(b)	1	... solves the problem.	5 grapes in each cup.
Q6(c)	1	Reasoning: ... checks that the shares are the same, as VC2M1N06.E02 asks — “counting or subitising to ensure they both have the same number of tiles”.	Each cup counted or subitised — 5, 5, 5; or $5 + 5 + 5 = 15$, so all the grapes are there. Award even where the same count serves Q6(b), provided the checking itself is seen or heard.
Q7(a)	1	... models a grouping situation — 3 equal groups of 4.	A drawing of 3 cars with 4 wheels each; or 3 groups of 4 cubes.
Q7(b)	1	... solves the problem using a calculation strategy.	12 wheels — counted one by one, or by groups: 4, 8, 12.
Q7(c)	1	... records the result — VC2M1N06.E01:	12; accept the number sentence $4 + 4 + 4 = 12$ (+

Part	Marks	Award the mark when the student ...	Accept
		“recording the results with a number”.	and = only — D9).

Reasoning marks — where the CD requires more than the answer

TOC §7 says of the checkpoints that “items score the strategy and the explanation, not only the answer. A rubric that scores only the answer fails the CD.” In this checkpoint the reasoning marks are:

- **Q3(b)** — shows or tells that both sides of = are the same (VC2M1N04 . E04: “showing and explaining the connections between any materials used using the language of plus and minus, and the numbers within the story problem”).
- **Q4(b) and Q5(b)** — the strategy must be shown or told, not only the total (VC2M1N05 . E01: “explaining the connections between any materials used, the Think Board diagram and the numbers within the story”).
- **Q6(c)** — the equal shares must be checked by counting or subitising (VC2M1N06 . E02: “counting or subitising to ensure they both have the same number of tiles”).

The model and strategy marks in Q1(a), Q2(a), Q4(a), Q5(a), Q6(a) and Q7(a) likewise score the working, not only the answer: each is awarded for what is seen on the desk.

Totals

CD	Questions	Marks
VC2M1N04	Q1–Q3	6
VC2M1N05	Q4–Q5	6
VC2M1N06	Q6–Q7	6
Checkpoint CP2 total	Q1–Q7	18

Record each CD’s score out of 6 as well as the total out of 18 — §4’s coverage audit reads delivery straight off the mark scheme, and a per-CD score says which of the three CDs is secure. This is a classroom instrument, not an exam (TOC §7, D17): use the result to plan the next teaching steps, not to rank students.

Teacher note

Curriculum map. Checkpoint CP2 scores the three CDs of Chapter 2 exactly as row T2 of TOC §7 specifies — VC2M1N04, VC2M1N05, VC2M1N06, 6 marks each, 18 marks. The items sample each CD’s full claim rather than its elaborations one by one (D11): Q1–Q3 cover adding, subtracting, the three operation symbols and the balance reading of = (VC2M1N04, with Q3 the equals-balance item 2A’s Teacher note asks T2 to keep); Q4–Q5 cover additive modelling with and without money in whole dollar amounts (VC2M1N05, E02’s buying shape and E03’s changing-count shape); Q6–Q7 cover equal sharing and grouping (VC2M1N06, E02’s sharing shape with the equality check and E01’s grouping shape recorded with a number). The elaboration ids cited in the Marking guide are copied verbatim from §4.

Administration (verbatim from TOC §7, row T2): “teacher-read; counters, ten-frames and play money supplied; number sentences using +, −, = recorded”. Untimed; no calculator (D17). Materials stay on the desk for the whole checkpoint; students choose what to use.

Ranges and symbols. Every total, sum and difference stays within 20 (D8): the largest collection is 15 (Q2, Q6) and the largest total 14 (Q4). Money is whole dollars only (D8, VC2M1N05 . E02). The only operation symbols are +, − and = (D9); the minus sign is printed as − (U+2212), the glyph VC2M1N04 . E04 requires students to recognise.

Money and data note. The play money is real Australian currency (TOC §6): \$1 and \$2 coins, \$5 and \$10 notes. Source: Royal Australian Mint, *Circulating coins*, retrieved 2026-08-19 — circulating coins are 5c, 10c, 20c, 50c, \$1 and \$2; 1c and 2c coins were withdrawn from circulation in 1992 and appear nowhere in this book. Banknotes:

Reserve Bank of Australia, *Banknotes* (rba.gov.au/banknotes), confirmed 2026-08-19 — \$5, \$10, \$20, \$50 and \$100. The class-shop prices in Q5 are set for the task, not claims about real prices (as in 2B). All other stories are invented, and the child's name (Tom) is invented, as permitted (TOC §6); no external datum is asserted beyond the currency facts above and the curriculum quotation in the front matter. No Aboriginal and Torres Strait Islander content is used (CONTENT_POLICY Rule 1, DJB 2026-08-15) — VC2M1N04.E05 is not drawn on here. No metric units (D7), no chance language (D6), no clock faces, no fractions, nothing from Foundation taught as new or from Level 2 taught early (D3).

Diagrams. Q4 and Q5 reuse the bus and shop images made for 2B (`../diagrams/2b_bus.png`, `../diagrams/2b_shop.png`); no new diagram is needed for this checkpoint.

Vocabulary gate record (run 2026-08-23). Student-facing text — everything from “Get ready” to the end of Q7 — is at or below the Yr1 ladder ceiling (rank 1), verified with `load_ladder/check_text/tokenize` from `S:\Files\projects\mcq-system\reports\vocab_level_check.py` (conservative min-placement lookup; the checker reads its own DB credentials). **Result: CLEAN — zero violations** after the curriculum exemption. The exemption set is every word of the content descriptions, elaborations and achievement-standard text of all 15 CDs in `maths_1.json` — the book-level `--cds` set (VOCABULARY_LEVEL.md exemption 1; WORD_LEVEL_POLICY Rule 2). One word is retained under that exemption although the ladder places it above Yr1: *price* (Yr2; verbatim in VC2M1N05.E02), defined at first use in “Get ready”. No unplaced tokens were returned. The front matter, Solutions, Marking guide and this Teacher note are teacher-facing metadata and are not vocabulary-gated (WORD_LEVEL_POLICY Rule 3). The word *checkpoint* (ladder rank 3, Yr3) appears only in the structural level-2 heading mandated by the pagination convention and in teacher-facing text; it does not appear in the student-facing body.