Mathematics, grade 1

All units for this subject and grade (unreviewed AI drafts)

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Grade 1 Mathematics: Adding and Taking Away Within 20 (5 lessons, about 4 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 9 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard.
>
> Text-checked by one other agent (Gemini 4 Argon); see Known gaps.

Back to the grade 1 year plan - Term 1. Builds on kindergarten term 3: Adding, taking away, teen numbers and comparing

Big idea

Adding and taking away are connected. A story problem can be about adding to, taking from, putting two parts together, splitting a whole into parts, or comparing two groups, and the unknown number can be at the end, in the middle or at the start. We do not have to count everything from 1: we can count on, make a ten, use doubles, or turn a take-away into "what do I add?". The equal sign means "is the same amount as", not "the answer comes next".

Outcomes

By the end of the unit most children can:

1. Solve story problems within 20 of all five kinds (adding to, taking from, putting together, taking apart, comparing), with the unknown at the end or in the middle, using objects, drawings or a number sentence with a box for the unknown.
2. Add by counting on from the larger number (for example 3 + 12: start at 12, say "13, 14, 15") and take away small numbers by counting back.
3. Add within 20 by making a ten (8 + 6 = 8 + 2 + 4 = 10 + 4 = 14) and add three numbers by finding two that make ten.
4. Use doubles and near doubles (6 + 7 = 6 + 6 + 1 = 13), and solve a take-away by thinking of the missing part (10 - 8: "8 and what make 10?").
5. Say whether a number sentence such as 4 + 1 = 5 + 2 is true or false, and find the missing number in sentences such as 8 + □ = 11.
6. Add and take away within 10 quickly (within a few seconds, with or without fingers).

Prior knowledge

The kindergarten units: counting to 20, ways to make 5 and 10 on a ten-frame, teen numbers as "ten and some more", and simple adding and taking-away stories within 10. Children still building these can work within 10 in every lesson.

Lessons

Each lesson is about 40 minutes: a short whole-class start, paired or group work with objects, and a closing check. Split a lesson over two days if needed; the unit runs over about 4 weeks, so each strategy should come back in short daily practice (5 minutes of quick facts or one story problem).

1. Story problems: adding, taking away, parts and wholes
2. Counting on and counting back
3. Making ten
4. Doubles, near doubles and fact families
5. Comparing and the equal sign

Materials (whole class unless noted)

- Linking cubes too large to swallow, in two colours: 20 per child (lessons 1 to 5). If colours are hard to tell apart, use two kinds of object instead (cubes and large buttons), so colour is not the only clue.
- Two ten-frames per child (lesson 3); one large ten-frame pair for the board.
- A 0 to 20 number line and a counter per pair (lesson 2), with numbers large enough to read and, if possible, raised marks (glue dots) at 0, 5, 10, 15 and 20. Optional: masking tape for a 0 to 20 track on the floor.
- A part-whole mat per pair (a sheet with one large box on top for the whole and two boxes below for the parts) for lessons 1 and 4.
- Digit cards 0 to 20 per pair, used for pointing to answers in every lesson.
- For lesson 3: a set of cards 1 to 9 per pair (for the pairs-to-ten game).
- For lesson 4, per group: two clean 12-hole egg boxes (or a 2 by 6 grid drawn on card); per pair: a set of fact-family triangle cards (see lesson 4).
- For lesson 5, per pair: true-or-false cards and missing-number cards (see lesson 5), support cards with one number on each side (such as 6 = 6 and 5 = 4), and two trays marked by touch (a rough sticker for true, a smooth one for false). Optional: a toy or home-made balance.
- Whiteboards and pens, or paper and pencils, for drawings and number sentences.

Assessment

Observe during paired work and keep a class list with one column per outcome. A one-to-one check (about 5 minutes per child) during the fourth week:

- "6 frogs are on a log. Some more hop on. Now there are 10. How many hopped on?" (4.) The child may use cubes, a drawing or 6 + □ = 10.
- "What is 8 + 5? Show me how you worked it out." (13. Making ten is 8 + 2 + 3 = 10 + 3; counting on from 8 is also fine.)
- "What is 6 + 7?" (13; a near double, 6 + 6 + 1, or any working strategy.)
- "What is 12 - 4?" (8; counting back, or "4 and what make 12?")
- Show the card 4 + 1 = 5 + 2. "Is this true or false?" (False: 4 + 1 is 5 and 5 + 2 is 7.)
- Quick facts within 10: 6 + 3 (9), 9 - 4 (5), 7 + 2 (9). An answer within a few seconds, with or without fingers, counts as quick.

Pointing to digit cards or the number line, sign, writing, or a communication device all count as answers. Record yes, with help or not yet for each part.

Sources

- Common Core State Standards, Grade 1 Operations and Algebraic Thinking (read to check what is usually expected in grade 1, not to claim alignment): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/OA/
- 1.OA.A.1 word problems within 20 of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, using objects, drawings and equations with a symbol for the unknown; 1.OA.A.2 adding three whole numbers with a sum up to 20; 1.OA.B.3 order and grouping as strategies (its examples are 8 + 3 = 3 + 8 and 2 + 6 + 4 = 2 + 10 = 12), with no need for the formal names; 1.OA.B.4 subtraction as an unknown-addend problem (10 - 8); 1.OA.C.5 relating counting to adding and taking away; 1.OA.C.6 adding and taking away within 20, fluency within 10, with strategies such as counting on, making ten (8 + 6 = 8 + 2 + 4), decomposing to a ten (13 - 4 = 13 - 3 - 1), and known sums (6 + 7 = 6 + 6 + 1); 1.OA.D.7 the meaning of the equal sign and true or false equations (its examples include 7 = 8 - 1 and 4 + 1 = 5 + 2); 1.OA.D.8 finding the unknown in equations such as 8 + ? = 11 and 5 = _ - 3.
- Common Core, Grade 1 introduction (four critical areas, the first being addition, subtraction and strategies within 20): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/introduction/

Known gaps and cautions

- Problems with the unknown at the start ("Some birds were on a wire, 3 more came, now there are 9") and comparing problems where the larger amount is unknown are the hardest kinds. As story problems they appear in lessons 1 and 5 only as stretch tasks; plan to return to them in term 2. Bare missing-number equations with the unknown first (5 = □ - 3, □ + 4 = 13) are core in lesson 5, step 3, because the box is easier to see than in a story.
- Fluency within 20 is not expected by the end of this unit; only within 10.
- The number line is used for counting on and back from small jumps only. Using it for bigger jumps comes later.
- The names in story problems are made up. Swap in names and objects that suit your class, but avoid using real children's belongings or families.
- Peer check: Gemini 4 Argon did a bounded text, timing and answer-key check at e844112 (not an educator or accessibility review). Keys and timings were correct. Its notes (materials lists out of step with lessons 2, 4 and 5; the start-unknown note did not match lesson 5's core missing-number cards; the equal-sign answer called 8 - 1 a sum) were fixed in the follow-up commit 8373393 (see PEERCHECKS.md), which Argon also diff-checked the same day.
- The lesson order and timings are my choice, not taken from a source.

Lesson 1: Story problems: adding, taking away, parts and wholes

Unit overview - Next: Lesson 2

About 40 minutes.

Goal

Children solve story problems within 20 about adding to, taking from, putting together and taking apart, with the unknown at the end or in the middle, and show them with cubes, drawings and number sentences.

Materials

- 20 linking cubes per child, in two colours (or two kinds of object).
- A part-whole mat per pair.
- Digit cards 0 to 20 per pair.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Remind children of kindergarten stories. "5 ducks are on the pond. 3 more come. How many now?" (8.) Write 5 + 3 = 8 and read it: "5 plus 3 equals 8." Then write 5 + 3 = □ and say: "The box is the number we don't know yet."

✎ Main activity (30 min)

1. **Adding to and taking from (10 min).** Tell each story twice; pairs use cubes or draw, then point to or write the answer.
    - "9 birds sit on a wire. 4 fly away. How many are left?" (5; 9 - 4 = 5.)
    - "7 children are on the bus. 6 more get on. How many now?" (13; 7 + 6 = 13.)
    - "12 apples are in a bowl. 5 are eaten. How many are left?" (7; 12 - 5 = 7.)
2. **Putting together and taking apart (10 min).** Show the part-whole mat: the whole goes in the top box, the two parts below.
    - "8 red flowers and 7 yellow flowers are in a pot. How many flowers?" (15; parts 8 and 7, whole 15.)
    - "There are 14 socks. 6 are spotty and the rest are striped. How many are striped?" (8; whole 14, one part 6, so the other part is 8.)
    - "11 cubes: split them into two towers any way you like. Write your two parts." (Any pair that makes 11, such as 5 and 6, 3 and 8, or 0 and 11.)
3. **The missing middle (10 min).** The change is unknown.
    - "6 frogs are on a log. Some more hop on. Now there are 10. How many hopped on?" (4; 6 + □ = 10.)

- "Ana had 11 cards. She gave some away. Now she has 7. How many did she give away?" (4; 11 - □ = 7.) Let children act it out with cubes: start with 6, add one at a time and count how many were added until there are 10.

✓ Discussion questions (with answers)

- In the bird story, did the number get bigger or smaller? Why? Smaller, because some birds flew away.
- In the sock story, nothing came or went. What happened instead? The socks were split into two groups; we knew the whole and one part.
- In the frog story, why is the answer not 10? 10 is how many there are at the end. The question asks how many hopped on, which is 4.

✓ Closing check (5 min, with answers)

"There are 13 buttons. 5 are red and the rest are blue. How many are blue?" Children draw, use cubes or point to a card. (8.) Then: "Write or point to a number sentence for it." (5 + 8 = 13, 13 - 5 = 8 or 5 + □ = 13 are all good.)

Vocabulary

plus, minus, equals, add, take away, altogether, left, part, whole, number sentence

Differentiation

- **Support:** totals up to 10; an adult reads the story again while the child moves cubes one at a time.
- **Stretch:** start-unknown stories: "Some birds were on a wire. 3 more came. Now there are 9. How many were there at first?" (6; □ + 3 = 9.)
- Any child can answer by pointing to a digit card, showing cubes, signing or using a communication device. Stories can be shown with pictures as well as told.

⚠ Safety

Use cubes too large to swallow.

Teacher notes and misconceptions

- Many children add any two numbers they hear. In the frog story they may say 16 (6 + 10). Ask them to act it out and check the story still makes sense.
- Keep the story language varied ("left", "now", "at first", "the rest") so children listen to the story rather than to key words.
- Several number sentences can fit one story; accept any that match it.

Lesson 2: Counting on and counting back

Unit overview - Previous: Lesson 1 - Next: Lesson 3

About 40 minutes.

Goal

Children add by counting on from the larger number, and take away 1, 2 or 3 by counting back, using a 0 to 20 number line.

Materials

- A 0 to 20 number line and a counter per pair.
- 20 linking cubes per child.
- Digit cards 0 to 20 per pair.
- Optional: a 0 to 20 track taped on the floor.

Steps

✎ Opening (5 min)

Count together from 0 to 20, then start from other numbers: "Start at 8 and count on 4: 9, 10, 11, 12." Children may hold up a finger for each number they say. If you have a floor track, volunteers can step along it while others count; children who prefer can move a counter on their table line instead.

✎ Main activity (30 min)

1. **Count on (10 min).** "9 + 3. Put your counter on 9. Don't count the 9 - we already have it. Jump 3: 10, 11, 12." (12.) Pairs try:
    - 8 + 3 (11)
    - 14 + 2 (16)
    - 15 + 4 (19) Check one with cubes: a tower of 9 and 3 more cubes is 12.
2. **Start with the bigger number (10 min).** "2 + 9. Is it quicker to start at 2 or at 9?" Build a tower of 2 and a tower of 9, join them, and turn the train round: it is the same train, 11 cubes. So 2 + 9 = 9 + 2 = 11. Pairs try, starting from the bigger number:
    - 3 + 12 (15)
    - 1 + 16 (17)
    - 4 + 13 (17)
3. **Count back (10 min).** "13 - 2. Put your counter on 13. Jump back 2: 12, 11." (11.) Pairs try:
    - 17 - 3 (14)
    - 20 - 1 (19)
    - 16 - 2 (14) Then check one with cubes: 17 cubes, take 3 away, count what is left (14).

✓ Discussion questions (with answers)

- When we count on from 9 for 9 + 3, why don't we say "9" again? The 9 is already there; we count only the 3 new jumps.
- Is 3 + 12 the same as 12 + 3? Yes. Both are 15; the same cubes in a different order.
- Would you count back to work out 15 - 9? It is slow and easy to lose track. Another way (thinking "9 and what make 15?") comes in lesson 4.

✓ Closing check (5 min, with answers)

"4 + 11. Show me where you start and where you land." (Start at 11; land on 15.) "16 - 3." (13.)

Vocabulary

count on, count back, jump, number line, start, land, the same as

Differentiation

- **Support:** totals up to 10; count on with cubes before using the line.
- **Stretch:** "I landed on 18 after jumping 3. Where did I start?" (15.)
- Number lines with large print and glue-dot marks at 0, 5, 10, 15 and 20 help children with low vision; they can also count cubes by touch. Children can give answers by pointing to the line, to digit cards, or by signing.

⚠ Safety

Floor tracks: walking only, with space between children. Keep the track away from doors and table corners.

Teacher notes and misconceptions

- The most common slip is counting the starting number as a jump: for 9 + 3 saying "9, 10, 11" and answering 11. Ask children to say the numbers they land on, not the number they start on.
- Counting back by more than 3 is error-prone; for bigger take-aways, use cubes or the strategies in lessons 3 and 4.

Lesson 3: Making ten

Unit overview - Previous: Lesson 2 - Next: Lesson 4

About 40 minutes.

Goal

Children know the pairs that make 10, use them to add within 20 by making a ten, and add three numbers by finding two that make ten.

Materials

- Two ten-frames and 20 counters or cubes per child, in two colours (or two kinds of object).
- Cards 1 to 9 per pair.
- A large pair of ten-frames for the board.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Quick pairs to ten. Show 7 on the big ten-frame. "How many more make 10?" (3.) Repeat with 4 (6), 9 (1), 5 (5) and 2 (8). Children answer with fingers, cubes or digit cards.

✎ Main activity (30 min)

1. **Pairs-to-ten game (8 min).** Pairs shuffle cards 1 to 9 and place them face down. One child turns a card; the other says, shows or points to the number that makes 10 with it. Swap after each card.
2. **Make a ten to add (12 min).** On the board: 8 + 6. Put 8 counters on the first ten-frame and 6 on the second. "The first frame needs 2 more to be full. Move 2 across." Now there are 10 and 4: 14. Write 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14. Pairs try with their frames:
    - 9 + 5 (14: move 1, so 10 + 4)
    - 7 + 5 (12: move 3, so 10 + 2)
    - 8 + 7 (15: move 2, so 10 + 5)
    - 9 + 8 (17: move 1, so 10 + 7)
3. **Three numbers (10 min).** "2 + 6 + 4. Can you see two numbers that make ten?" (6 and 4.) So 2 + 10 = 12. Pairs try:
    - 7 + 5 + 3 (15: 7 + 3 = 10, then 5 more)
    - 1 + 8 + 9 (18: 1 + 9 = 10, then 8 more)
    - "Bo has 3 red pencils, 5 blue pencils and 7 green pencils. How many pencils?" (15: 3 + 7 = 10, then 5 more.)

✓ Discussion questions (with answers)

- Why is 10 + 4 easier than 8 + 6? Ten and some more is a teen number we already know: ten and 4 is 14.
- For 9 + 5, why do we move just 1? 9 needs only 1 more to make 10.
- Does it matter which order we add three numbers in? No; the total is the same, so we can pick the order that makes a ten.

✓ Closing check (5 min, with answers)

"9 + 4. Show me on your ten-frames." (13: move 1, 10 + 3.) "5 + 3 + 5." (13: 5 + 5 = 10, then 3 more.)

Vocabulary

make ten, pair, full, ten-frame, ten and some more

Differentiation

- **Support:** stay with pairs to ten and with 9 + a small number, where only 1 counter moves.
- **Stretch:** take away through ten: 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9. Use the ten-frames: take away the 3 loose counters first, then 1 from the full frame.
- Ten-frames can be made tactile (counters in an egg box or a 2 by 5 grid of cups) for children with low vision. Children can answer by pointing to digit cards or moving counters instead of speaking.

⚠ Safety

Use counters too large to swallow.

Teacher notes and misconceptions

- Some children move the wrong number of counters, or move counters from the first frame to the second. Ask "Which frame is nearly full?" first.
- Writing 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14 is a teacher record. Children do not need to write chains like this yet, and it should not be used to suggest that "=" means "and then".

Lesson 4: Doubles, near doubles and fact families

Unit overview - Previous: Lesson 3 - Next: Lesson 5

About 40 minutes.

Goal

Children use doubles and near doubles to add, and solve a take-away by thinking of the missing part ("8 and what make 10?").

Materials

- Two empty 12-hole egg boxes (or a 2 by 6 grid on card) and 12 cubes per group. One box shows doubles up to 6 + 6; the second box lets the group show doubles up to 10 + 10, one row of 10 holes across the two boxes.
- 20 linking cubes per child.
- A part-whole mat per pair.
- Fact-family triangle cards per pair: triangles with three numbers at the corners, for example 8, 4, 12; 3, 7, 10; 6, 9, 15. The biggest number (the whole) is at the top corner.
- Digit cards 0 to 20 per pair.
- Whiteboards and pens, or paper and pencils, for recording number sentences.

Steps

✎ Opening (5 min)

Doubles. Fill one row of an egg box with 6 cubes and the other row with 6. "6 and 6 make?" (12.) Children build cube towers in pairs of the same height: 5 and 5 (10), 7 and 7 (14), 8 and 8 (16), 9 and 9 (18), 10 and 10 (20).

✎ Main activity (30 min)

1. **Doubles practice (8 min).** In pairs, one child builds a tower of up to 10 cubes; the other builds the same and says the double. Record: 7 + 7 = 14.
2. **Near doubles (10 min).** "6 + 7. 7 is one more than 6, so it is double 6 and 1 more." 6 + 6 + 1 = 12 + 1 = 13. Pairs check with towers, then try:
    - 7 + 8 (15: 7 + 7 + 1)
    - 8 + 9 (17: 8 + 8 + 1)
    - 5 + 6 (11: 5 + 5 + 1)
3. **Fact families and "what do I add?" (12 min).** Take the triangle 8, 4,
4. With cubes on the part-whole mat: whole 12, parts 8 and 4. Together find four number sentences: 8 + 4 = 12, 4 + 8 = 12, 12 - 8 = 4, 12 - 4 = 8. Then: "10 - 8. Think: 8 and what make 10?" (2.) Pairs try:
    - 15 - 7 (think 7 + □ = 15; 8)
    - 13 - 9 (think 9 + □ = 13; 4)

- Write the four sentences for the triangle 3, 7, 10 (3 + 7 = 10, 7 + 3 = 10, 10 - 3 = 7, 10 - 7 = 3).

✓ Discussion questions (with answers)

- How does knowing 6 + 6 help with 6 + 7? 6 + 7 is one more than 6 + 6, so it is 13.
- If you know 8 + 4 = 12, what else do you know? 4 + 8 = 12, 12 - 8 = 4 and 12 - 4 = 8.
- For 13 - 9, why is thinking "9 and what make 13?" easier than counting back 9? Counting back 9 is long and easy to lose track of; 9 needs 1 to make 10 and 3 more to make 13, so 4.

✓ Closing check (5 min, with answers)

"7 + 7." (14.) "7 + 8." (15.) "14 - 7." (7, because 7 + 7 = 14.)

Vocabulary

double, near double, one more, fact family, whole, part

Differentiation

- **Support:** doubles up to 5 + 5 with fingers or cubes, and fact families for totals up to 10.
- **Stretch:** near doubles the other way: 8 + 7 = 8 + 8 - 1 = 15. Or make their own triangle card and write all four sentences.
- Egg boxes and cube towers can be checked by touch. Children can show answers with cubes, digit cards or sign.

⚠ Safety

Use clean egg boxes (washed or never used for eggs) and cubes too large to swallow.

Teacher notes and misconceptions

- Some children think 12 - 8 and 8 - 12 are the same, because 8 + 4 and 4 + 8 are. Show with cubes that we cannot take 12 away from 8 cubes; in a take-away, the whole comes first.
- Near doubles only help once doubles are quick. Keep short daily doubles practice going.

Lesson 5: Comparing and the equal sign

Unit overview - Previous: Lesson 4

About 40 minutes.

Goal

Children solve "how many more?" and "how many fewer?" problems, decide whether number sentences are true or false, and find missing numbers.

Materials

- 20 linking cubes per child, in two colours (or two kinds of object).
- True-or-false cards, one set per pair: 6 = 6; 7 = 8 - 1; 5 + 2 = 2 + 5; 4 + 1 = 5 + 2; 10 = 6 + 4; 9 + 1 = 10 + 1.
- Missing-number cards: 8 + □ = 11; 5 = □ - 3; 6 + 6 = □; □ + 4 = 13; 15 - □ = 9.
- Optional: a toy or home-made balance and equal-sized cubes.
- Digit cards 0 to 20 per pair; whiteboards and pens.
- Support cards with one number on each side (6 = 6, 5 = 4), and two trays marked by touch (a rough sticker for true, a smooth one for false), for children who need them (see Differentiation).

Steps

✎ Opening (5 min)

Build a tower of 9 cubes and a tower of 6, side by side. "How many more cubes does the tall tower have?" Children see 3 extra at the top. "9 is 3 more than 6. 6 is 3 fewer than 9."

✎ Main activity (30 min)

1. **Comparing stories (10 min).** Pairs build towers to match each story.
   - "Mia has 12 shells. Tom has 8. How many more shells does Mia have?" (4.)
   - "Bo has 5 stickers. Ana has 3 more than Bo. How many stickers does Ana have?" (8.)
   - "Sam has 11 marbles. Lee has 4 fewer than Sam. How many marbles does Lee have?" (7.)
2. **True or false? (10 min).** "The equal sign means both sides are the same amount." If you have a balance, show 3 + 2 cubes on one side and 5 on the other: it balances. Pairs sort the cards into true and false, using cubes to check:
   - 6 = 6 (true)
   - 7 = 8 - 1 (true)
   - 5 + 2 = 2 + 5 (true)
   - 4 + 1 = 5 + 2 (false: 5 on one side, 7 on the other)
   - 10 = 6 + 4 (true)

    - 9 + 1 = 10 + 1 (false: 10 and 11) Then: "Change one number to make 4 + 1 = 5 + 2 true." (For example 4 + 3 = 5 + 2, or 4 + 1 = 5 + 0.)
3. **Missing numbers (10 min).** Pairs find each box using cubes or a strategy from this unit:
    - 8 + □ = 11 (3)
    - 5 = □ - 3 (8)
    - 6 + 6 = □ (12)
    - □ + 4 = 13 (9)
    - 15 - □ = 9 (6)

✓ Discussion questions (with answers)

- Some people think 7 = 8 - 1 is wrong because the answer should come last. Is it wrong? No. Both sides are 7, so it is true; the equal sign can have the single number or the calculation on either side.
- In the sticker story, does "more" mean we add? Here yes: Ana has Bo's 5 and 3 more, 8. But in the shell story, "how many more" is found by comparing or taking away (12 - 8 = 4). Read the whole story, not one word.
- How did you find 5 = □ - 3? Think: what number, take away 3, leaves 5? 5 + 3 = 8.

✓ Closing check (5 min, with answers)

"Is 3 + 4 = 7 true? Is 7 = 3 + 4 true?" (Both true.) "9 + □ = 16." (7.)

Vocabulary

compare, more than, fewer than, how many more, equal sign, the same as, true, false, missing number

Differentiation

- **Support:** compare towers up to 10; true-or-false cards with only one number on each side first (6 = 6, 5 = 4).
- **Stretch:** comparing with the bigger amount unknown: "Lee has 7 marbles. That is 4 fewer than Sam. How many has Sam?" (11.) Or make up a true-or-false card for a partner.
- Children can sort cards by touch-marked trays (a rough sticker for true, a smooth one for false), point, sign or use a device. Read cards aloud for children who need it.

⚠ Safety

Use cubes too large to swallow. Keep a home-made balance low and steady on the table.

Teacher notes and misconceptions

- "=" read as "makes" leads children to call 7 = 8 - 1 false and to write answers such as 8 + □ = 11 with □ = 19 (adding all the numbers they see). Read "=" as "is the same as".

- Comparing problems are harder than adding to or taking from. Lining up two towers and looking at the extra part helps more than any rule.
- The names are made up; use names that do not belong to children in the class if comparisons might feel personal.

Grade 1 Mathematics: Tens and Ones to 100 (5 lessons, about 4 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 9 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard.
>
> Text-checked by one other agent (Gemini 4 Argon); see Known gaps.

Back to the grade 1 year plan - Term 2. Builds on term 1: Adding and taking away within 20

Big idea

Ten ones can be grouped and treated as one thing, a "ten". A two-digit number tells us how many tens and how many ones: 47 is 4 tens and 7 ones. Because of this we can count big collections quickly, compare numbers by looking at the tens first, find 10 more or 10 less without counting in ones, and add by putting tens with tens and ones with ones.

Outcomes

By the end of the unit most children can:

1. Count to 120 starting from any number below 120, and read and write the numbers in that range.
2. Count a collection of up to about 100 objects by grouping it into tens, and say how many tens and ones there are (for example, 4 towers of ten and 7 loose cubes is 47).
3. Explain that 11 to 19 are a ten and some ones, and that 10, 20, 30 ... 90 are 1 to 9 tens and no ones.
4. Compare two two-digit numbers by looking at the tens and then, if the tens are the same, the ones, and record the result with >, = or <.
5. Find 10 more and 10 less than a two-digit number without counting in ones, and add and take away multiples of ten (30 + 40, 80 - 30).
6. Add a one-digit number or a multiple of ten to a two-digit number within 100, using cubes or drawings, including sums where the ones make a new ten (27 + 5 = 32).

Prior knowledge

The term 1 unit (adding and taking away within 20, making ten) and the kindergarten idea of teen numbers as "ten and some more". Children who are still building these can work with numbers to 50 in every lesson.

Lessons

Each lesson is about 40 minutes: a short whole-class start, paired work with cubes, and a closing check. Split a lesson over two days if needed; the unit runs over about 4 weeks, so counting, 10 more and 10 less, and comparing should come back in short daily practice (5 minutes).

1. Grouping in tens and counting to 120
2. Tens and ones on a place-value mat

3. Comparing two-digit numbers
4. Ten more, ten less, and adding and taking tens
5. Adding within 100

Materials (whole class unless noted)

- Linking cubes too large to swallow, all one colour or mixed: 100 per pair (lessons 1 to 5). Children snap them into towers of ten.
- Optional for lesson 1: craft sticks, about 60 per pair, with strips of paper and tape to wrap bundles of ten (no rubber bands, which may contain latex).
- A tray or sheet of paper per pair to keep each collection together (lesson 1), and some collections to count: about 30 to 60 small objects per pair, too large to swallow (cubes, large buttons, counters).
- A place-value mat per pair (lessons 2, 3 and 5): a sheet split into a "tens" side on the left and a "ones" side on the right, with a strip of card glued down the middle as a ridge and a rough sticker on the tens side, so the two sides can be told apart by touch.
- Two sets of digit cards 0 to 9 per pair (lessons 2, 3 and 5), large print, with each digit outlined in glue or string (or with braille labels) so the cards can be read by touch.
- Symbol cards >, < and = per pair (lesson 3), with the symbol outlined in glue or string so it can be felt. Optional: a toy or home-made balance.
- A 1 to 100 chart (ten rows of ten, 1 at the top left) per pair and a large one for the board (lesson 4), with three counters per child. Large print; if possible, a raised dot on every number in the 10s column (10, 20 ... 100).
- A number strip from 95 to 120 for the board (lesson 1), and a 0 to 120 counting track or the class number line if you have one.
- Whiteboards and pens, or paper and pencils, for drawings and number sentences.

Assessment

Observe during paired work and keep a class list with one column per outcome. A one-to-one check (about 5 minutes per child) during the fourth week:

- "Count on from 97. I'll tell you when to stop." Stop at 112. (98, 99, 100, 101 ... 112; saying 97 first is fine too.) Then: "Write one hundred and four." (104, not 1004.)
- Show 4 towers of ten and 7 loose cubes. "How many cubes?" (47.) Then: "Show me 63 with cubes." (6 towers of ten and 3 loose cubes.)
- "How many tens and ones are in 16? In 50?" (1 ten and 6 ones; 5 tens and 0 ones.)
- Show the cards 58 and 85. "Which is greater? Put a symbol between them." (85 is greater; 58 < 85, because 5 tens is less than 8 tens.)
- "What is 10 more than 46? What is 10 less than 46?" (56; 36.)
- "What is 70 - 40?" (30: 7 tens take away 4 tens is 3 tens.)
- "What is 34 + 8? Show me with cubes or a drawing." (42: 4 + 8 = 12, a new ten and 2 ones, so 3 tens + 1 ten = 4 tens and 2 ones.) "What is 25 + 30?" (55.)

Pointing to cubes, digit cards or the chart, sign, writing, or a communication device all count as answers. Record yes, with help or not yet for each part.

Sources

- Common Core State Standards, Grade 1 Number and Operations in Base Ten (read to check what is usually expected in grade 1, not to claim alignment): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/NBT/
- 1.NBT.A.1 count to 120 starting at any number less than 120, and read and write numerals in that range; 1.NBT.B.2 the two digits of a two-digit number are amounts of tens and ones, with the special cases (a) 10 as a bundle of ten ones called a "ten", (b) 11 to 19 as a ten and one to nine ones, (c) 10, 20 ... 90 as one to nine tens and 0 ones; 1.NBT.B.3 compare two two-digit numbers using the meaning of the digits, recording with >, = and <; 1.NBT.C.4 add within 100, including a two-digit number and a one-digit number, and a two-digit number and a multiple of 10, with models, drawings and place-value strategies, adding tens and tens, ones and ones, and sometimes composing a ten; 1.NBT.C.5 find 10 more or 10 less mentally, without counting, and explain the reasoning; 1.NBT.C.6 subtract multiples of 10 in the range 10 to 90 from multiples of 10, with a positive or zero answer.
- Common Core, Grade 1 introduction (four critical areas, the second being whole number relationships and place value): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/introduction/

Known gaps and cautions

- Taking a one-digit number or a two-digit number away from a two-digit number (for example 42 - 7 or 56 - 23) is not taught here; only taking away multiples of ten. Those come in grade 2.
- Adding two two-digit numbers that are not multiples of ten (34 + 25) is not core; it appears only as a stretch task in lesson 5.
- Hundred charts differ: some start at 0, and some count upwards from the bottom. This unit uses 1 to 100 with 1 at the top left. If your class uses another chart, change "down a row" and "up a row" to match.
- Calling > and < a crocodile's mouth that "eats the bigger number" is a tradition some classes use, not part of the source. This unit asks children to read the symbols as words ("is greater than", "is less than"); the crocodile picture is optional.
- Fluency with 10 more and 10 less is expected; fluency with adding within 100 is not.
- Peer check: Gemini 4 Argon did a bounded text, link, timing and answer-key check at 944d536 (not an educator or accessibility review). Links, counts, timings and keys were correct. Its notes (some side-by-side builds in lessons 1 and 3 needed more than 100 cubes; the one-to-one check did not cover writing numbers past 100 or outcome 3; digit cards had no tactile marking) were fixed in the follow-up commit 096f355 (see PEERCHECKS.md), which Argon also diff-checked the same day.
- The lesson order and timings are my choice, not taken from a source.

Lesson 1: Grouping in tens and counting to 120

Unit overview - Next: Lesson 2

About 40 minutes.

Goal

Children count a large collection by grouping it into tens, say how many tens and ones there are, and count on past 100 up to 120.

Materials

- 100 linking cubes per pair.
- A collection of about 30 to 60 small objects per pair (cubes, large buttons or counters, too large to swallow), each on a tray or sheet of paper.
- Optional: about 60 craft sticks per pair, with paper strips and tape for wrapping bundles of ten.
- A number strip from 95 to 120 on the board, and a counting track or class number line if you have one.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Count together in ones from different starting numbers: "Start at 28 and count to 35." "Start at 56 and count to 64." Stop at the decade changes (29 to 30, 59 to 60) and ask: "What comes after 39?" (40.) Children who prefer not to say the numbers aloud can point along the number line or tap a finger for each number.

✎ Main activity (30 min)

1. **How many? (10 min).** Give each pair a collection of 30 to 60 objects. "Guess how many, then count them. How can you count so you don't lose track?" Let pairs try their own way first. Then show one way: make groups of ten (in lines, or as towers of linking cubes) and count the groups "10, 20, 30, 40", then the loose ones "41, 42, 43". Pairs count their collection again in tens and write the number. For example 4 groups of ten and 3 more is 43.
2. **Make a ten (10 min).** "Ten ones can become one ten." Each pair snaps cubes into towers of ten. If you have craft sticks, pairs wrap groups of ten sticks with a paper strip to make bundles. The teacher shows some towers and loose cubes and pairs say how many:
    - 2 towers and 6 cubes (26)
    - 5 towers and 0 cubes (50)
    - 1 tower and 8 cubes (18)

    - 7 towers and 4 cubes (74) Then pairs build numbers the teacher says: 35 (3 towers, 5 cubes); 60 (6 towers, no cubes); 19 (1 tower, 9 cubes).
3. **Past 100 (10 min).** Count from 95 to 120 together, pointing to the strip on the board: "...98, 99, 100, 101..." Show that the numbers after 100 go on like the numbers after 0: 101, 102, 103 ... 110, 111 ... 120. Pairs take turns: one says a start number between 95 and 110, the other counts on five numbers (for example 107: 108, 109, 110, 111, 112). Children write two of the numbers they said on a whiteboard (such as 104 and 111).

✓ Discussion questions (with answers)

- Why is counting in tens quicker than counting in ones? We count 4 groups instead of 40 single objects, and if we lose our place we only recount one group.
- Is a tower of ten cubes one thing or ten things? Both: it is ten ones, and we can also count it as one ten.
- What comes after 109? 110. (A common answer is "200"; see teacher notes.)

✓ Closing check (5 min, with answers)

Show 3 towers of ten and 6 loose cubes. "How many?" (36.) "Count on from 98 to 103." (99, 100, 101, 102, 103.)

Vocabulary

ten, tens, ones, group, bundle, tower, count on, hundred

Differentiation

- **Support:** collections up to 30; count to 50 instead of 120.
- **Stretch:** "I have 9 towers and 12 loose cubes. How many cubes?" (102: the 12 loose cubes make another tower and 2, so 10 towers and 2.) This needs more than one pair's 100 cubes: join with another pair, or draw lines for tens and dots for ones.
- Children with low vision or who are blind can count by touch: towers of ten feel different from loose cubes. Children can show answers by building with cubes, pointing to the number line, writing, signing, or using a communication device.

⚠ Safety

Use objects too large to swallow. Keep craft sticks on the tables, and no rubber bands (latex allergies, and they flick).

Teacher notes and misconceptions

- Some children count the towers in ones ("1, 2, 3, 4") and then the loose cubes ("5, 6, 7"), giving 7 instead of 43. Ask them to count one tower cube by cube, then say "so this tower is 10".

- Past 100, children often say "200" after 109, or write 101 as "1001" (one hundred, then one). Say and write the numbers together, and point out that 101 has three digits, like 100.

Lesson 2: Tens and ones on a place-value mat

Unit overview - Previous: Lesson 1 - Next: Lesson 3

About 40 minutes.

Goal

Children show two-digit numbers as tens and ones on a mat, explain that 11 to 19 are a ten and some ones and that 10, 20 ... 90 are tens with no ones, and say what each digit means.

Materials

- 100 linking cubes per pair, with some already snapped into towers of ten.
- A place-value mat per pair (tens on the left, ones on the right; card ridge down the middle and a rough sticker on the tens side).
- Two sets of digit cards 0 to 9 per pair, large print with a raised outline.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Show 2 towers and 4 loose cubes. "How many?" (24.) Put the towers on the tens side of a large mat and the loose cubes on the ones side, then put the digit card 2 under the tens side and 4 under the ones side. "The 2 tells us 2 tens. The 4 tells us 4 ones."

✎ Main activity (30 min)

1. **Teen numbers (10 min).** "Show 13 on your mat." (1 tower, 3 cubes.) Pairs show 11 to 19 in turn, putting digit cards under each side, and say the sentence "13 is 1 ten and 3 ones." Ask: "What is the same about all these numbers?" (They all have 1 ten; the first digit is always 1.)
2. **Decades (10 min).** "Show 30." (3 towers, no loose cubes.) "What digit goes on the ones side?" (0, because there are no ones.) Pairs show 20, 50, 80 and 90, and say "50 is 5 tens and 0 ones." Then ask: "How many tens is 100?" (10 tens.) Pairs check by putting 10 towers together.
3. **Same digits, different numbers (10 min).** Pairs show 27 and then 72 (2 tens and 7 ones; 7 tens and 2 ones). "Are they the same?" (No: 72 has many more cubes.) Then one child picks two digit cards and puts them on the mat; the partner builds the number with cubes and says it. Swap roles. Examples to check: 4 and 6 (46 or 64), 9 and 1 (91 or 19), 5 and 0 (50, or 05, which is just 5).

✓ Discussion questions (with answers)

- In 46, what does the 4 mean? 4 tens, which is 40.

- Why is there a 0 in 60? To show there are no ones; without it the number would be 6.
- Is 19 more like 10 or like 90? Like 10: it has only 1 ten (19 is 1 ten and 9 ones).

✓ Closing check (5 min, with answers)

"Show 52 on your mat." (5 towers, 2 cubes.) "What does the 5 mean?" (5 tens, 50.) "How many tens and ones in 80?" (8 tens, 0 ones.)

Vocabulary

place value, tens, ones, digit, tens side, ones side, teen numbers

Differentiation

- **Support:** numbers to 30; one digit card set and a ready-made tower per ten.
- **Stretch:** "Show 34 a different way, using only 2 towers." (2 towers and 14 loose cubes.)
- The ridge and the rough sticker let children tell the two sides of the mat apart by touch, so colour is never the only clue. Children can answer by pointing, building, signing, or using a communication device.

⚠ Safety

Use cubes too large to swallow.

Teacher notes and misconceptions

- The teen number names are irregular: "thirteen" says the 3 first, but the 1 ten is written first. Children often write 13 as 31. Saying "1 ten and 3 ones" before writing helps.
- Some children read the digits but not their value ("46 is a 4 and a 6"). Keep asking "4 what?" until the answer is "4 tens".

Lesson 3: Comparing two-digit numbers

Unit overview - Previous: Lesson 2 - Next: Lesson 4

About 40 minutes.

Goal

Children compare two two-digit numbers by looking at the tens first and then the ones, and record the result with the symbols >, = and <.

Materials

- 100 linking cubes per pair, with towers of ten.
- A place-value mat per pair.
- Two sets of digit cards 0 to 9 per pair, large print with a raised outline.
- Symbol cards >, < and = per pair, with raised outlines.
- Optional: a toy or home-made balance.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Build 34 and 43 side by side with towers and cubes. "Which has more cubes? How can you tell quickly?" (43: it has 4 tens, and 34 has only 3 tens. The ones do not matter here, because one ten is more than any number of ones up to 9.)

✎ Main activity (30 min)

1. **Tens first, then ones (10 min).** Pairs build each pair of numbers and say which is greater:
    - 36 and 32 (36; same tens, so look at the ones: 6 is more than 2)
    - 50 and 49 (50; 5 tens is more than 4 tens, even though 49 has 9 ones)
    - 41 and 14 (41; 4 tens is more than 1 ten)
    - 28 and 28 (they are equal) Each time, children say the sentence: "36 is greater than 32."
2. **The symbols (10 min).** Write 36 > 32 and read it: "36 is greater than 32." Write 32 < 36 and read it: "32 is less than 36." The pointed end points to the smaller number; the open side faces the greater number. (Some classes call the symbol a crocodile's mouth that opens towards the bigger number; that picture is optional.) Pairs put a symbol card between number cards and read the sentence aloud or sign it:
    - 63 and 36 (63 > 36)
    - 47 and 49 (47 < 49)
    - 80 and 80 (80 = 80)
    - 15 and 51 (15 < 51)

3. **Make the bigger number (10 min).** Each child in a pair takes two digit cards without looking and arranges them to make the greatest number they can (with 3 and 7, make 73). Partners put their numbers side by side, place the right symbol between them and read the sentence. The child with the greater number keeps a cube; play several rounds. Tell children that "0" cannot go first in this game, since 05 is just 5.

✓ Discussion questions (with answers)

- Why do we look at the tens first? Because one ten is more than all the ones in a number (at most 9), so the number with more tens is greater.
- When do we need to look at the ones? When the tens are the same, as in 36 and 32.
- You have the cards 3 and 7. What is the greatest number you can make, and the smallest? 73 and 37.

✓ Closing check (5 min, with answers)

"Which symbol goes between 63 and 36?" (>, 63 is greater.) "Between 47 and 49?" (<, 47 is less.) "Read this: 28 = 28." ("28 is equal to 28.")

Vocabulary

greater than, less than, equal to, compare, symbol, tens first

Differentiation

- **Support:** compare numbers within 30, and build both numbers every time before choosing a symbol. Use a balance to show "equal" if you have one.
- **Stretch:** "Find all the numbers that make this true: 4□ > 46." (47, 48, 49.)
- Raised symbol cards let children feel which way the symbol points. Children can answer by placing a card, pointing, signing, or using a communication device.

⚠ Safety

Use cubes too large to swallow.

Teacher notes and misconceptions

- Every number built in this lesson fits in one pair's 100 cubes (the biggest side-by-side build, 50 and 49, uses 99).
- Children who look at the ones first may say 49 is greater than 50 ("9 is bigger than 0"). Build both: 4 towers and 9 cubes next to 5 towers.
- The symbols are often reversed. Reading the whole sentence aloud, from left to right, is a better check than remembering which way the symbol faces.

Lesson 4: Ten more, ten less, and adding and taking tens

Unit overview - Previous: Lesson 3 - Next: Lesson 5

About 40 minutes.

Goal

Children find 10 more and 10 less than a two-digit number without counting in ones, and add and take away multiples of ten.

Materials

- A 1 to 100 chart per pair (ten rows of ten, 1 at the top left) and a large one for the board, with three counters per child.
- 100 linking cubes per pair, with towers of ten.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Count in tens together from 0 to 100, then from 3: "3, 13, 23, 33 ..." up to 93. "What changes and what stays the same?" (The tens digit goes up by one; the ones digit stays 3.)

✎ Main activity (30 min)

1. **Patterns on the chart (10 min).** Pairs put a counter on 24 and then on the number just below it (34) and just above it (14). "What happens when we move down one row?" (The number goes up by 10.) "Up one row?" (It goes down by 10.) Pairs try from 57 (down 67, up 47) and from 81 (down 91, up 71).
2. **10 more, 10 less (10 min).** Build 34 with towers and cubes. "Add one tower. How many now?" (44.) "Take away one tower from 34." (24.) Only the tens change. Pairs answer without counting in ones, then check on the chart or with cubes:
    - 10 more than 46 (56)
    - 10 less than 71 (61)
    - 10 more than 89 (99)
    - 10 less than 15 (5)
    - 10 more than 90 (100)
3. **Adding and taking tens (10 min).** "30 + 40. 3 tens and 4 tens make 7 tens, so 70." Pairs use towers only:
    - 50 + 20 (70)
    - 30 + 60 (90)
    - 80 - 30 (50)
    - 90 - 40 (50)

- 60 - 60 (0) Each time ask children to say it in tens: "8 tens take away 3 tens is 5 tens."

✓ Discussion questions (with answers)

- Why does only the tens digit change when we add 10? We add one ten and no ones, so the ones stay the same.
- What is 10 less than 15, and where is it on the chart? 5. It is in the same column as 15, one row up.
- How is 7 - 4 like 70 - 40? 7 ones take away 4 ones is 3 ones; 7 tens take away 4 tens is 3 tens, or 30.

✓ Closing check (5 min, with answers)

"What is 10 more than 52?" (62.) "10 less than 52?" (42.) "What is 70 - 20?" (50.)

Vocabulary

10 more, 10 less, row, column, hundred chart, multiple of ten

Differentiation

- **Support:** use towers and cubes for every question before the chart; numbers to 50.
- **Stretch:** "What is 20 more than 37? 30 less than 85?" (57; 55.)
- Large-print charts with a raised dot on each number in the 10s column help children with low vision or who are blind find the rows. Counters mark numbers, so colour is never needed. Children can answer by pointing, building, signing, or using a communication device.

⚠ Safety

Use cubes and counters too large to swallow.

Teacher notes and misconceptions

- Some children count on ten ones every time ("46, 47, 48 ... 56"). That gives the right answer but misses the point; ask "What changed?" and build it with one tower.
- On the chart, the numbers that end in 0 sit at the right-hand end of each row, so 30 is in the row with 21 to 29, not with 31. Children may expect 30 to start a new row.

Lesson 5: Adding within 100

Unit overview - Previous: Lesson 4

About 40 minutes.

Goal

Children add a multiple of ten or a one-digit number to a two-digit number within 100, putting tens with tens and ones with ones, and make a new ten when the ones add up to 10 or more.

Materials

- 100 linking cubes per pair, with towers of ten.
- A place-value mat per pair.
- Two sets of digit cards 0 to 9 per pair, large print with a raised outline.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Quick questions from lesson 4: "10 more than 63?" (73.) "40 + 30?" (70.) "What is 7 + 5?" (12.) "How many tens and ones is 12?" (1 ten and 2 ones.)

✎ Main activity (30 min)

1. **Adding tens (10 min).** "23 + 30. Build 23 on your mat. Add 3 towers to the tens side. How many tens now? How many ones?" (5 tens, 3 ones: 53.) Only the tens change. Pairs build and write the number sentence:
    - 46 + 20 (66)
    - 58 + 40 (98)
    - 15 + 70 (85)
2. **Adding ones (10 min).** "32 + 5. Build 32, add 5 loose cubes to the ones side." (3 tens, 7 ones: 37.) Only the ones change. Pairs try:
    - 61 + 7 (68)
    - 44 + 4 (48)
    - 83 + 6 (89)
3. **Making a new ten (10 min).** "27 + 5. Build 27, add 5 loose cubes. How many ones now?" (12.) "Can we make a new tower?" Snap 10 of the ones into a tower and move it to the tens side: now 3 tens and 2 ones, 32. Write it as 7 + 5 = 12, so 20 + 12 = 32. Pairs try, making a new tower each time:
    - 38 + 6 (44)
    - 45 + 9 (54)
    - 56 + 4 (60; the new ten leaves no ones)

✓ Discussion questions (with answers)

- In 23 + 30, why do we add the 3 tens to the tens side, not the ones side? 30 is 3 tens; 23 + 3 would be 26, which is a different sum.
- When do we need to make a new ten? When the ones add up to 10 or more, as in 27 + 5, where 7 + 5 = 12.
- Why is 56 + 4 exactly 60? 6 + 4 = 10 ones, which is a new ten, so we have 6 tens and no ones.

✓ Closing check (5 min, with answers)

"36 + 7. Show me with cubes or a drawing." (43: 6 + 7 = 13, a new ten and 3 ones, so 4 tens and 3 ones.) "52 + 30?" (82.)

Vocabulary

add, tens, ones, make a new ten, number sentence, sum

Differentiation

- **Support:** questions without a new ten first; totals up to 50; build every question with cubes.
- **Stretch:** "34 + 25. Add the tens, then the ones." (30 + 20 = 50, 4 + 5 = 9, so 59.) Then: "27 + 35." (50 + 12 = 62.)
- Children can draw tens as lines and ones as dots instead of using cubes. Children who are blind or have low vision can build on the tactile mat. Answers can be given by pointing to digit cards, building, signing, or a communication device.

⚠ Safety

Use cubes too large to swallow.

Teacher notes and misconceptions

- A common error in 23 + 30 is adding the 3 to the ones (answer 26) or writing "2330". Saying "30 is 3 tens" before building helps.
- In 27 + 5, some children write 212 ("2 tens and 12 ones"). Making the new tower with real cubes, and moving it to the tens side, shows why the answer is 32.
- Use the last part of the week for the one-to-one check in the unit overview.

Grade 1 Mathematics: Measuring Length and Putting Shapes Together (5 lessons, about 4 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 9 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard.
>
> Text-checked by one other agent (Gemini 4 Argon); see Known gaps.

Back to the grade 1 year plan - Term 3. Builds on term 2: Tens and ones to 100

Big idea

To compare lengths fairly, we line the ends up. When two things cannot be put side by side, a third thing (a piece of string) can carry one length to the other. To say how long something is, we lay copies of one small unit end to end, with no gaps and no overlaps, and count them. Shapes have a few things that make them that shape (a triangle is closed and has three straight sides), and things that do not matter (colour, size, which way it is turned). Shapes can be put together to make new shapes.

Outcomes

By the end of the unit most children can:

1. Put three objects in order from shortest to longest, lining up the ends.
2. Compare two lengths that cannot be put side by side by using a third object, and explain the result in words ("the string was the same as the table, and the rug was longer than the string, so the rug is longer").
3. Measure a length by laying equal units end to end with no gaps or overlaps, and say the length as a number of units ("8 cubes long").
4. Say whether a shape is a triangle, square or rectangle using its sides and corners, not its colour, size or which way it is turned, and build one with craft sticks or draw one.
5. Put two or more shapes together to make a new shape (two triangles make a square), and use that new shape to make a bigger one.

Prior knowledge

The kindergarten units on comparing (longer, shorter, taller) and naming flat shapes, and counting to 20 and beyond from terms 1 and 2.

Lessons

Each lesson is about 40 minutes: a short whole-class start, paired work and a closing check. Split a lesson over two days if needed; the unit runs over about 4 weeks, so measuring and shape sorting should come back in short daily practice (5 minutes).

1. Shortest to longest

2. Comparing with a piece of string
3. Measuring with equal units
4. What makes a triangle a triangle?
5. Putting shapes together

Materials (whole class unless noted)

- Lesson 1: two pencils of different lengths; per pair, two sets of three stiff card strips (set 1: 8, 14 and 20 cm; set 2: 11, 17 and 24 cm), each strip marked with a letter (A, B, C) and the same number of raised dots (1, 2, 3); a hardback book or ruler as an edge to line ends up against; per child, a recording sheet and glue stick; 6 spare strips and a large book to stand up as a screen for the closing check (see lesson 1).
- Lesson 2: masking tape; six measuring stations prepared before the lesson (see lesson 2); per pair, one piece of string about 1.5 m long, cut by an adult, and two clothes pegs; per child, a recording sheet and two small answer cards (a table picture and a rug picture); two picture cards for the closing check (see lesson 2); the teacher's answer key for the stations.
- Lesson 3: per pair, 30 linking cubes all the same size (the cubes from term 2), 10 unit cards (identical card rectangles, each exactly as long as two cubes), and three card strips to measure, cut to exactly 6, 8 and 10 cubes long; per child, a recording sheet; a tray with four demonstration strips (one with a gap, one with an overlap, one with mixed cubes and unit cards, and one measured correctly).
- Lesson 4: per pair, a set of 24 shape cards cut from card (so edges can be felt): 8 triangles of different sizes, colours and turns, 4 squares, 4 rectangles, and 8 "not quite" shapes (a three-sided shape with a gap, a three-sided shape with one curved side, a four-sided shape that is not a rectangle, a circle, a half-circle, and three other shapes with more than four sides); four large shape cards for the closing check, hand-sized copies of them and a small blue triangle (see lesson 4); a sorting mat with two areas labelled "triangle" and "not a triangle" (words, a drawn triangle and a raised outline); per child, 8 craft sticks (checked for splinters) and a whiteboard and pen.
- Lesson 5: per pair, a bag of card shapes: 8 right-angled triangles (two equal 5 cm sides), 4 squares (5 cm sides), 2 rectangles (5 cm by 10 cm), 4 half-circles (10 cm across) and 4 quarter-circles (5 cm radius); 6 outline cards to fill (see lesson 5); per child, a blank sheet, pencil, whiteboard and pen; a larger set of the card shapes for the teacher to show.
- Assessment: one set of lesson 1 strips, the lesson 2 picture cards, a lesson 3 strip and cubes, 6 shape cards, 8 craft sticks and 4 triangles from lesson 5.

Assessment

Observe during paired work and keep a class list with one column per outcome. A one-to-one check (about 6 minutes per child, so about 2.5 hours for 25 children, spread over the fourth week):

- Give three strips from set 2, ends not lined up. "Put them in order from shortest to longest." (11, 17, 24 cm. Watch whether the child lines up the ends.)
- Show the two lesson 2 picture cards and say: "Sam's string was just as long as the table. The string was shorter than the rug. Which is longer, the table or the rug?" (The rug.)
- Give the 8-cube strip and loose cubes. "How long is this strip in cubes?" (8 cubes, laid end to end with no gaps or overlaps.) Then show the gap strip from lesson 3: "Is this measured right? Why not?" (No: there is a gap, so the count is too small.)
- Give 6 shape cards (2 triangles turned different ways, a square, a rectangle, the three-sided shape with a gap, and the shape with a curved side). "Give me all the triangles." (The 2

triangles only.) "Why is this one not a triangle?" (It is not closed / one side is not straight.) "Which card is a rectangle but not a square?" (The rectangle.)
- Give 4 craft sticks. "Make a triangle." Then, with 4 sticks, "Make a square." (A closed shape with three straight sides; then four equal sides and four square corners. Drawing the shapes on a whiteboard counts too.)
- Give 4 right-angled triangles. "Make a square." (Long sides together.) "Now make a rectangle using that square." (Make a second square from the other two triangles and put the two squares side by side.)

Pointing, moving the pieces, sign, writing, or a communication device all count as answers. Record yes, with help or not yet for each part.

Sources

- Common Core State Standards, Grade 1 Measurement and Data (read to check what is usually expected in grade 1, not to claim alignment): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/MD/
- 1.MD.A.1 order three objects by length; compare the lengths of two objects indirectly by using a third object. 1.MD.A.2 express the length of an object as a whole number of length units by laying multiple copies of a shorter object end to end; the length is the number of same-size units that span it with no gaps or overlaps; limited to objects spanned by a whole number of units.
- Common Core, Grade 1 Geometry: https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/G/
- 1.G.A.1 distinguish defining attributes (for example, triangles are closed and three-sided) from non-defining attributes (colour, orientation, overall size); build and draw shapes with defining attributes. 1.G.A.2 compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles and quarter-circles) to make a composite shape, and compose new shapes from the composite shape. A footnote says children should use transitivity to make indirect comparisons but need not use the term.
- Common Core, Grade 1 introduction (four critical areas, the third being linear measurement as iterating length units and the fourth composing and decomposing shapes): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/introduction/

Known gaps and cautions

- Peer check: Gemini 4 Argon did a bounded text, link, timing, number and shape-geometry check at 1ba989a (not an educator or accessibility review). Its notes (the assessment did not check building or drawing shapes, or making a bigger shape from a made shape; station lines in lesson 2 needed feelable marks at both ends, not only the start) were fixed in 049cf5e, which Gemini 4 Argon also diff-checked the same day (see PEERCHECKS.md). This is a peer check by an AI agent, not an educator review.
- Not covered here: telling time (1.MD.B.3), data with up to three categories (1.MD.C.4; the term 3 computing unit in the year plan sorts and counts with a picture chart) and halves and quarters (1.G.A.3). A school following the Common Core would need to teach these elsewhere.
- Three-dimensional shapes (cubes, cylinders, cones) are named in 1.G.A.2 but this unit uses flat shapes only.
- Standard units (centimetres, inches) are not taught; the strip lengths in centimetres are for the teacher to cut them.

- The unit never measures or compares children's bodies (heights, hands, feet). That is a choice made here, not from the source, so that nobody's size is compared in front of the class.
- The strip lengths, station objects and shape sets are examples, not from a source.

Lesson 1: Shortest to longest

Unit overview - Next: Lesson 2

About 40 minutes.

Goal

Children put three objects in order by length and explain that the ends must be lined up to compare fairly.

Materials

- Two pencils of different lengths (for example 10 cm and 15 cm).
- Per pair: two sets of three stiff card strips (set 1: 8, 14 and 20 cm; set 2: 11, 17 and 24 cm). Mark each strip with a letter (A, B, C, in a mixed order so the letters do not give the answer) and the same number of raised dots (one dot for A, two for B, three for C).
- Per pair: a hardback book or ruler to line the ends up against.
- Per child: a recording sheet with three empty boxes labelled "shortest", "in between" and "longest", and a glue stick.
- For the closing check: 6 spare strips (two sets of three, made like set 1 and set 2) and a large book to stand up as a screen.

Steps

✎ Opening (5 min)

Hold the two pencils upright in one fist so the short pencil sticks up higher than the long one (its bottom end is hidden lower down in your hand). "Which pencil is longer?" Many children will say the one that sticks up. Open your hand and lay both pencils on the table with their ends against the edge of a book. "Now which is longer?" Agree: **to compare lengths, line up the ends.**

✎ Main activity (30 min)

1. Model with set 1: put the three strips against the book edge, ends touching it, and run a finger along to the other ends. "Which end sticks out furthest? That strip is the longest." Say the order aloud: shortest, in between, longest.
2. Pairs order set 1 against their own book edge. One child lines up the ends; the other says the order. Swap roles and do set 2.
3. Each child glues one set on their recording sheet, shortest to longest.
4. Stretch: "Mix both sets together. Can you put all six strips in order?" (8, 11, 14, 17, 20, 24 cm.)

✓ Discussion questions (with answers)

- "Why did the short pencil look longer at the start?" (Its ends were not lined up with the other pencil's ends.)
- "B is longer than A. C is longer than B. Is C longer than A?" (Yes.)
- "If I turn the longest strip round, is it still the longest?" (Yes; turning it does not change its length.)

✓ Closing check (5 min, with answers)

Behind the standing book, lay out three of the spare strips with their ends not lined up, then lift the book away. Each child shows on their fingers (1, 2 or 3 dots) which strip is the longest, all at the same time, then which is the shortest. Repeat once with the other spare set. (Children who line the ends up in their heads or ask to move the strips are doing the right thing; let them move them.)

Vocabulary

long, longer, longest; short, shorter, shortest; in between; length; line up the ends

Differentiation

- Support: use two strips before three, with a big difference in length.
- Stretch: the six-strip order above; or order three classroom objects (a crayon, a glue stick, a pencil case) chosen by the child.
- Blind or low-vision children: line the strips up against the book edge by touch and feel which end sticks out furthest; the raised dots name the strips.
- Children who cannot use their fingers easily can nudge strips with a palm or say/point to the order; a partner can line up the ends while they direct.
- For the closing check, children who do not use fingers can point, nod at the right strip as the teacher touches each one, or sign; blind children feel the three strips after the book is lifted.
- Colour is never the only clue; letters and dots name the strips.

⚠ Safety

Card strips only; no scissors for children in this lesson.

Teacher notes and misconceptions

- Children often compare only one end (whichever sticks out at the top or right). The pencil opening is there to make that visible.
- "Longest" and "tallest" are the same idea; "tallest" is used when the object stands up.

Lesson 2: Comparing with a piece of string

Unit overview - Previous: Lesson 1 - Next: Lesson 3

About 40 minutes.

Goal

Children compare two lengths that cannot be put side by side by carrying one length to the other with a piece of string, and explain the result.

Materials

- Masking tape and six measuring stations, set up before the lesson. Each station has two lengths in different places, marked A and B with a letter and a raised tape tab at both ends of each line (a folded tab at the start and a small block or a dot of tape at the finish), so the ends can be felt. An example set (not from a source; change it to fit your room):
    1. Two floor lines in different corners: A 100 cm, B 120 cm.
    2. A line on a table top (A, 60 cm) and a line on the floor (B, 50 cm).
    3. A line on a wall at about 80 cm from the floor, so it can be reached from a wheelchair (A, 70 cm), and a floor line (B, 70 cm). These are the same length.
    4. Two floor lines, one straight across (A, 80 cm) and one slanting (B, 90 cm).
    5. The width of the teacher's table (A) and the width of a cupboard (B). Choose two things that are each shorter than the string.
    6. The width of the classroom door (A) and the width of a bookshelf (B).
- The teacher's answer key: write the answers for stations 5 and 6 after checking them with string before the lesson.
- Per pair: one piece of string about 1.5 m long, cut by an adult, and two clothes pegs.
- Per child: a recording sheet with a row per station: "A is longer", "B is longer", "the same" (words and simple pictures), to circle.
- Two picture cards for the closing check: a table with a string lying along it, just as long, and a rug with the same string lying on it, shorter than the rug.
- Per child: two small answer cards, one with a table picture and one with a rug picture.

Steps

✎ Opening (5 min)

"I want to know if this table is longer than the rug. Can I pick up the table and put it next to the rug?" (No, it is too heavy.) "In lesson 1 we lined the ends up. What could we do now?" Take ideas. Show the string: lay it along line A at station 1 with one end at the start tab, and clip a peg on the string exactly where line A ends. "Now the string remembers how long line A is." Carry it to line B.

✎ Main activity (30 min)

1. At station 1, lay the string along line B from its start tab. "Does the peg come before the end of B, at the end, or past it?" (Before the end: B is longer.) Say the reasoning aloud together: "The string is as long as A. B is longer than the string. So B is longer than A."
2. Pairs visit three or four stations. One child holds the string's end at the start tab; the other lays it along and clips the peg. They swap roles at the next station. Each child circles the answer on their sheet.
3. As you go round, ask each pair to say the reasoning sentence for one station: "The string is as long as ... . is longer / shorter / the same as the string. So ... ."
4. Stretch: "Use the string to find something in the room that is about as long as line A at station 1." (Answers vary; check by laying the string along it.)

✓ Discussion questions (with answers)

- Station 1: B is longer. Station 2: A is longer. Station 3: the same. Station 4: B is longer. Stations 5 and 6: see your key.
- "At station 3, one line is on the wall and one is on the floor. Does that change which is longer?" (No; where a line is, or which way it points, does not change its length.)
- "What would go wrong if the string's end did not start at the start tab?" (The peg would not show the real length; it is like not lining up the ends.)

✓ Closing check (5 min, with answers)

Show the two picture cards and say: "Sam's string was just as long as the table. Then Sam put the string on the rug. The string was shorter than the rug. Which is longer, the table or the rug?" Children hold up one answer card at the same time. (The rug.) Then: "If the string had been longer than the rug, which would be longer?" (The table.)

Vocabulary

compare; just as long as; the same length; longer than; shorter than; start; end

Differentiation

- Support: begin with station 1 or 4, where the difference is 10 to 20 cm; an adult can hold the start end.
- Stretch: put three lengths in order with the string: line A at station 4 and both lines at station 1. (Station 4 line A is shortest, then station 1 line A, then station 1 line B.)
- Blind or low-vision children: feel the folded start tab and the block or tape dot at the finish; feel where the peg sits against the finish.
- Wheelchair users: station 3's wall line and table lines are reachable; for floor lines, a partner lays the string while the child directs and checks the peg.
- Children who use sign or a device give the reasoning sentence that way; a partner can say it while they point to each part.

⚠ Safety

- Adults cut and hand out the string; no scissors for children.
- String goes along lines and objects only, never round fingers, wrists or necks. Collect it at the end of the lesson.
- Floor stations should be away from doors and walkways so nobody trips.

Teacher notes and misconceptions

- The lengths of stations 1 to 4 are chosen so the answers are clear (at least 10 cm apart) except station 3, where the point is that two lengths in different places can be the same.
- Some children think a slanting line is longer because it "goes further". Station 4 lets them check.
- The standards expect children to use this kind of reasoning ("if A is the same as the string and B is longer than the string, B is longer than A") without learning a name for it.

Lesson 3: Measuring with equal units

Unit overview - Previous: Lesson 2 - Next: Lesson 4

About 40 minutes.

Goal

Children measure a length by laying equal units end to end, with no gaps and no overlaps, and say the length as a number of units.

Materials

- Per pair: 30 linking cubes all the same size (the cubes from term 2).
- Per pair: 10 unit cards: identical card rectangles, each exactly as long as two cubes joined together.
- Per pair: three card strips to measure, cut to exactly 6, 8 and 10 cubes long and labelled with a letter and raised dots (P, one dot; Q, two dots; R, three dots).
- A tray with three demonstration strips measured wrongly: one with a gap between two cubes, one with two cubes overlapping (one cube pushed partly on top of another), and one with cubes and unit cards mixed; and a fourth strip measured correctly with cubes, for the closing check.
- Per child: a recording sheet with a row for each strip: "Strip P is ... cubes long" and "Strip P is ... unit cards long".

Steps

✎ Opening (5 min)

Lay a strip on the table and put loose cubes along it with gaps between them. "I counted 4 cubes, so it is 4 cubes long. Do you agree?" Take ideas. Push the cubes together with no gaps, and keep adding cubes until they reach the end. Count again. Agree the rules: **start at one end, no gaps, no overlaps, all the units the same size, stop at the other end.**

✎ Main activity (30 min)

1. Pairs measure strips P, Q and R with cubes. One child lays the cubes from the start end; the other checks for gaps and overlaps and counts. Swap for each strip. Children write or say the number (P 6, Q 8, R 10).
2. Pairs measure the same strips with unit cards (P 3, Q 4, R 5).
3. Show the tray. For each demonstration strip, ask: "What went wrong? Will the count be too big or too small?" (Gap: some of the strip is not covered, so the count is too small. Overlap: two units share the same bit of strip, so the count is too big. Mixed units: the number does not tell us how long, because the units are not the same.)

4. Stretch: "Strip R is 10 cubes long but only 5 unit cards long. Why are the numbers different?" (A unit card is as long as two cubes, so you need fewer of them.) Or: lay P, Q and R end to end and measure all three together (24 cubes).

✓ Discussion questions (with answers)

- "Strip Q is 8 cubes long. If Ali counts 7, what might have happened?" (A gap, or Ali did not start at the end.)
- "If Ben counts 9, what might have happened?" (An overlap, or a cube past the end.)
- "Could we measure with a cube and a pencil and a crayon?" (No; the units must all be the same size, or the number does not mean anything.)

✓ Closing check (5 min, with answers)

Hold up each demonstration strip from the tray, one at a time, and a fourth strip measured correctly. Children show thumbs up (measured right) or thumbs down (measured wrong) at the same time. (Gap: down. Overlap: down. Mixed: down. Correct: up.) Then ask one child to say what was wrong with the gap strip. (It has a gap, so the count is too small.)

Vocabulary

measure; unit; end to end; gap; overlap; the same size; how long

Differentiation

- Support: measure strip P only, then Q; place a line on the strip where each cube should go (6 boxes drawn on strip P).
- Stretch: the two stretch questions above.
- Blind or low-vision children: feel along the strip for gaps between cubes, and feel that the last cube ends at the strip's end; linking the cubes together removes gaps.
- Children who cannot use their fingers easily can direct a partner ("one more, push it closer") and check by looking or touching with a palm.
- Children who do not use thumbs can hold up a "yes" or "no" card, or nod or shake their head, for the closing check.

⚠ Safety

Collect loose cubes from the floor; nobody should step on them.

Teacher notes and misconceptions

- The strips are cut so they are exactly a whole number of units long; the standard limits grade 1 measuring to this.
- Linking the cubes into a train is a good way to avoid gaps. Some children count the cubes before they have reached the end; ask them to run a finger along to check.

- Comparing cube counts with unit-card counts is a stretch, not an outcome.

Lesson 4: What makes a triangle a triangle?

Unit overview - Previous: Lesson 3 - Next: Lesson 5

About 40 minutes.

Goal

Children decide whether a shape is a triangle, square or rectangle by its sides and corners, not by its colour, size or which way it is turned, and build these shapes with craft sticks.

Materials

- Per pair: a set of 24 shape cards cut from card (so the edges can be felt): 8 triangles of different sizes, colours and turns (including long thin ones and upside-down ones); 4 squares; 4 rectangles that are not squares; and 8 "not quite" shapes: a three-sided shape with a gap at one corner, a three-sided shape with one curved side, a four-sided shape that is not a rectangle, a circle, a half-circle, and three shapes with more than four sides.
- Per pair: a sorting mat with two areas labelled "triangle" and "not a triangle" (the words, a drawn triangle and a raised outline of a triangle).
- Four large shape cards for the closing check: an upside-down triangle, a three-sided shape with a gap, a big red triangle, and a three-sided shape with one curved side; a hand-sized copy of each of these four, and a small blue triangle, for the opening and for children who check by touch.
- Per child: 8 craft sticks (checked for splinters), a whiteboard and pen.

Steps

✎ Opening (5 min)

Hold up the big red triangle card, then turn it upside down. "Is it still a triangle?" Then the small blue triangle. "Is this a triangle?" Agree that colour, size and turning do not change what shape it is. Ask: "So what does make a triangle?" Collect ideas and agree on: **closed (no gaps), three straight sides, three corners.**

✎ Main activity (30 min)

1. Pairs sort their shape cards onto the mat: triangle or not a triangle. For each "not a triangle" card with three sides, they say why. (Gap: not closed. Curved side: not all sides straight.)
2. Take the squares and rectangles out of the "not a triangle" pile. Count sides and feel the corners. "Both have four straight sides and four square corners. A square's sides are all the same length." Pairs sort them into squares and rectangles.
3. Building: each child makes a triangle with 3 craft sticks, then a square with 4. "Can you make a rectangle that is not a square?" (Use 6 sticks: two sticks end to end for each long side, one stick for each short side.) Children check each other's shapes against the rules.

4. Children draw one triangle and one rectangle on their whiteboard and show a partner.
5. Stretch: "Make the biggest triangle you can with all 8 sticks." Or: "Draw a triangle that nobody else in the class will draw." (Any closed shape with three straight sides counts.)

✓ Discussion questions (with answers)

- "Mia says this long thin shape is not a triangle because it is too thin. Is she right?" (No: it is closed and has three straight sides, so it is a triangle.)
- "Is a square turned on its corner still a square?" (Yes; turning does not change the shape.)
- "Why is the shape with a gap not a triangle?" (It is not closed.)

✓ Closing check (5 min, with answers)

Hold up the four large closing-check cards, one at a time, and leave them in a row. Each child writes on their whiteboard how many of the four are triangles and everyone holds up together. (2: the upside-down triangle and the big red triangle.) Ask one child why the curved one is not a triangle. (One side is not straight.)

Vocabulary

triangle; square; rectangle; side; corner; straight; curved; closed; turned

Differentiation

- Support: sort only triangles and circles first, then add the "not quite" shapes.
- Stretch: the two stretch tasks above.
- Blind or low-vision children: feel along each edge for straight or curved sides and count corners by touch; the gap shape has a clear gap to feel. For the closing check, give them a hand-sized copy of each card to feel.
- Children who cannot hold craft sticks easily can direct a partner by pointing to where each stick goes.
- Children who cannot write a number can hold up fingers, point to a number card, or sign.
- Colour is never the clue to a shape's name.

⚠ Safety

Check craft sticks for splinters before the lesson; collect them afterwards.

Teacher notes and misconceptions

- Children often think a triangle must have a flat bottom and a point at the top, because that is how pictures usually show it. Many turned and thin triangles in the card set help.
- A square is a special kind of rectangle (it has four square corners). Some classes say this in grade 1 and some leave it for later; it is not assessed in this unit.

Lesson 5: Putting shapes together

Unit overview - Previous: Lesson 4

About 40 minutes.

Goal

Children put two or more shapes together to make a new shape, then use that new shape to make a bigger one.

Materials

- Per pair: a bag of card shapes: 8 right-angled triangles (the two sides next to the square corner are each 5 cm), 4 squares (5 cm sides), 2 rectangles (5 cm by 10 cm), 4 half-circles (10 cm across) and 4 quarter-circles (5 cm radius).
- Per pair: 6 outline cards, each with a shape drawn full size and its outline raised (glue line or wool) so it can be felt:
    1. a square, 5 cm sides;
    2. a rectangle, 5 cm by 10 cm;
    3. a circle, 10 cm across;
    4. a trapezoid, 15 cm along the bottom, 5 cm along the top, 5 cm high;
    5. a big right-angled triangle, 10 cm along each side next to the square corner;
    6. a big square, 10 cm sides.
- Per child: a blank sheet and a pencil, for drawing round a design.
- Per child: a whiteboard and pen (as in lesson 4), for the closing check.
- One set of the card shapes, larger, for the teacher to show (or a visualiser).

Steps

✎ Opening (5 min)

Show two triangles. "What shape could these two triangles make if I put them together?" Take guesses, then put the long sides together: a square. Then: "Two of these squares?" (A rectangle.) "Now we have made a rectangle out of triangles and a square. We made a new shape from a shape we had already made."

✎ Main activity (30 min)

1. Pairs fill outline cards 1, 2 and 3 with shapes from the bag, so that the shapes cover the outline with no gaps and no overlaps. They say which shapes they used.
2. Then cards 4, 5 and 6. Encourage more than one way for each card.
3. Free building: each child makes their own picture or pattern from at least four shapes and draws round it on their sheet. Partners say one shape they can see that was made from two smaller shapes.
4. Opt-in share: children who want to can show their design to the class. Nobody has to.

5. Stretch: "Make a big square from triangles only. How many triangles do you need?" (8 for card 6.) "Make a circle from quarter-circles. How many?" (4.)

✓ Discussion questions (with answers)

Answer key for the outline cards (other correct ways count too; check with the shapes):

- Card 1 square: 2 triangles (or 1 square).
- Card 2 rectangle: 2 squares, 4 triangles, 2 triangles and 1 square, or 1 rectangle.
- Card 3 circle: 2 half-circles, or 4 quarter-circles, or 1 half-circle and 2 quarter-circles.
- Card 4 trapezoid: 1 square in the middle with a triangle on each side, or 4 triangles.
- Card 5 big triangle: 4 triangles, or 1 square and 2 triangles.
- Card 6 big square: 4 squares, 2 rectangles, 8 triangles, or a mix (for example 1 rectangle and 2 squares).
- "Two half-circles make a circle. What do two quarter-circles make?" (A half-circle.)

✓ Closing check (5 min, with answers)

Show outline card 1 and two triangles. "How many triangles fill this square?" Children write the number on a whiteboard, or hold up fingers, at the same time. (2.) Then show outline card 6: "How many small squares fill this big square?" (4.)

Vocabulary

put together; make; new shape; square; rectangle; triangle; trapezoid; half-circle; quarter-circle; circle; no gaps, no overlaps

Differentiation

- Support: start with cards 1 and 3, with the shapes needed set out beside the card.
- Stretch: the two stretch questions above; or make a shape and give a partner its outline to fill.
- Blind or low-vision children: feel the raised outline, then fit shapes inside it by touch; edges of card shapes can be felt meeting.
- Children who cannot place shapes easily can point to where each shape goes while a partner places it, or move shapes by sliding them with a palm.
- The free design is shared only if the child wants to.

⚠ Safety

Card shapes only; no small pieces that need picking up from the floor beyond the usual tidy-up.

Teacher notes and misconceptions

- Some children turn a shape the wrong way and decide "it doesn't fit". Encourage turning and flipping.
- The trapezoid is named here because it appears in the source's list of shapes; children do not need to define it.