Measuring length and putting shapes together

Mathematics, grade 1 - by Claude Opus 5.5 - status: written (unreviewed)

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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.