Mathematics, grade K

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

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Kindergarten Mathematics: Counting, Comparing and Sorting (5 lessons, about 2 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 6 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.

New (trial layout): the whole unit on one page, with a picture for each step.

Back to the kindergarten year plan

Big idea

Counting is not just saying numbers in order. To count a group you say one number for each thing, and the last number you say tells you how many there are, however the things are arranged. Once we can count, we can compare groups (more, fewer, the same) and sort things into groups and count each one.

Outcomes

By the end of the unit most children can:

1. Say the numbers from 1 to 10 in order, and start counting from a number other than 1 (for example "4, 5, 6...").
2. Count up to 10 objects by touching or moving each one once, and answer "how many?" with the last number they said.
3. Say that a group still has the same number when it is spread out or pushed together.
4. Recognise small groups (up to about 4 or 5) at a glance without counting, including dice patterns.
5. Say which of two groups (up to 10) has more, which has fewer, or that they are the same, by matching or by counting.
6. Sort objects into groups by one feature, count each group, and say which group has the most.

Prior knowledge

None is assumed. Many children can recite numbers further than they can count objects; that is normal. Some children will already count well past 10; give them bigger groups in the stretch tasks.

Lessons

Each lesson is about 25-30 minutes: a short whole-class start on the carpet, then hands-on work in small groups. Split a lesson over two days if needed.

1. Counting songs and touch counting
2. The last number tells how many

3. Quick looks
4. More, fewer or the same?
5. Sort it, count it

Materials (whole class unless noted)

- Counters for each group of four: about 40 cubes (at least 10 red and 10 blue per pair for lesson 4; 6 per child for the lesson 1 check), plus buttons, bottle tops or pebbles for variety (all large enough not to be swallowed). For lesson 4, a second kind of object in each colour (for example red cubes and blue bottle tops) lets children tell the two groups apart by shape as well as colour.
- Ten-frames (a 2 by 5 grid on card), one per child.
- Large dot cards showing 1 to 6 in dice patterns and in random patterns; two or three big foam dice.
- Two paper plates per pair. Small dice, one per pair (lesson 3).
- Optional: a puppet or soft toy who "makes mistakes" (lesson 2).
- Five toy cups and four toy spoons, or pictures of them (lesson 4 opening).
- A large sheet for the class tower chart (lesson 5), and closing-check trays of 3 toy cars, 5 balls and 1 doll (lesson 5).
- Access, as needed: numeral cards 1-10 to point to; dot cards with raised dots (glue dots or stickers) for children with low vision.
- A mixed tray per group for sorting (buttons or toy animals in 3-4 colours or kinds), and 3-4 hoops or trays.
- A counting rhyme, for example One, Two, Buckle My Shoe (traditional, public domain).

Assessment

Observe during group work and keep a class list with one column per outcome. A quick one-to-one check (2 minutes per child) near the end of the unit:

- Put 7 cubes in a line. "How many?" Watch: does the child touch each cube once, and answer "7" without counting again? (Answer: 7.)
- Spread the same 7 cubes out. "How many now?" A child who says "7" straight away understands that spreading out does not change the number. A child who counts again is still fine at this stage; note it.
- Show a dot card with 3. "How many?" (3, ideally without counting.)
- Show 5 red cubes and 3 blue cubes. "Which has more?" (red; 5 is more than 3.)
- "Count on from 4." (4, 5, 6, 7...)

Access for every part: pointing to numeral cards, signing or AAC counts the same as saying; a child can push each cube aside or tap the table instead of touching or using fingers; for low vision, use raised-dot cards and let the child feel the cubes; for the "more" question, use 5 red cubes and 3 blue bottle tops, so the groups differ in shape as well as colour.

Sources

- Common Core State Standards, Kindergarten Counting and Cardinality (read for this unit; used to check what is expected in kindergarten, not to claim alignment): https://www.thecorestandards.org/Math/Content/K/CC/
- K.CC.A.2 count forward from a given number; K.CC.B.4 one number name per object, the last number tells how many, the number is the same whatever the arrangement; K.CC.B.5

count up to 10 scattered objects; K.CC.C.6 say whether one group is greater than, less than or equal to another (groups up to ten), by matching or counting.
- Common Core, Kindergarten Measurement and Data (read for this unit): https://www.thecorestandards.org/Math/Content/K/MD/
- K.MD.B.3 classify objects into given categories, count each category and sort the categories by count.
- Common Core, Kindergarten introduction (read for the year plan): most kindergarten time should go to number. https://www.thecorestandards.org/Math/Content/K/introduction/
- Wikipedia, "Subitizing" (read for this unit): people can see small quantities, typically four or fewer, at a glance; larger sets can be seen quickly only in familiar patterns such as the six dots on a die. https://en.wikipedia.org/wiki/Subitizing

Known gaps and cautions

- Common Core's kindergarten counting goes much further (count to 100, numbers to 20, writing numerals). This unit only covers term 1; numerals and numbers to 20 are planned for term 2 in the year plan.
- The lesson order and timings are my choice, not taken from a source.
- Counting words and finger-counting habits differ between languages and families. Welcome children counting in their home language too.
- Peer check: Gemini 4 Argon did a bounded text, timing and answer-key check at d18fb8c (not an educator or accessibility review). Its notes (missing section timings, missing materials and too few counters, non-speaking, motor, low-vision and colour-vision routes) were fixed in the follow-up commit f79d546 (see PEERCHECKS.md), which Argon also diff-checked the same day.

Lesson 1: Counting songs and touch counting

Unit overview - Next: Lesson 2

About 25-30 minutes.

Goal

Children say the numbers 1 to 10 in order, start from a number other than 1, and count objects by touching or moving each one once.

Materials

- One, Two, Buckle My Shoe (traditional).
- Counters (cubes, buttons or bottle tops) and a ten-frame per child.

Steps

✎ Opening (5 min)

Say One, Two, Buckle My Shoe together with actions. Then count to 10 together, clapping once per number. Then "Start at 4": 4, 5, 6, 7, 8, 9, 10. Try starting at 2 and at 6.

✎ Main activity (18 min)

1. **Model touch counting (4 min).** Put 5 cubes in a row. Count them aloud wrongly on purpose: skip one, or count one twice. "Was I right?" Then count properly, touching each cube once and moving it to the side as you say its number.
2. **Partner counting (10 min).** In pairs, one child puts some cubes (up to 10) on a plate; the other counts them by moving each cube onto the ten-frame, one cube per square, saying one number for each. Swap.
3. **Count the room (4 min).** Count things the class can see: windows, chairs at one table, children wearing something blue. Touch or point at each one.

✓ Discussion questions (with answers) (3 min)

- What went wrong when I counted? You missed one out (or counted one twice).
- Why move the cube when you count it? So you know which ones you have already counted.
- If we start at 4, what comes next? 5.

✓ Closing check (with answers) (3 min)

Each child counts out 6 cubes onto their ten-frame from a pile. (Answer: 6 cubes, one in each of 6 squares.) Note who touches each one once.

Vocabulary

count, number, one, two, three... ten, next, start

Differentiation

- **Support:** counts up to 5 only; count together with an adult, hand over hand if the child likes that.
- **Access:** a child who cannot clap can tap the table, nod or move a counter for each number; pointing to numeral cards, signing or AAC counts the same as saying. For low vision, let the child feel each cube as they move it.
- **Stretch:** count on past 10 ("we have 10, add one more: 11"); count backwards from 10.

⚠ Safety

Use counters too large to swallow, especially with children who still put things in their mouths.

Teacher notes and misconceptions

- Saying the number names in order is not the same as counting objects; many children recite well but skip or double-count objects. Moving each object helps.
- Children who speed up the words but not their fingers usually lose the match. Slow, steady counting is the aim.

Lesson 2: The last number tells how many

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

About 25-30 minutes.

Goal

Children answer "how many?" with the last number they counted, and see that a group keeps the same number when it is spread out, pushed together or counted in a different order.

Materials

- Counters and two paper plates per pair.
- A puppet or soft toy (optional) who "makes mistakes".

Steps

✎ Opening (5 min)

Count 4 cubes with the class. Then ask "How many?" If children start counting again, say: "We already counted. The last number we said was 4, so there are 4." Repeat with 6 cubes.

✎ Main activity (18 min)

1. **Puppet puzzles (5 min).** The puppet counts 5 cubes in a line correctly. Then you spread them out and the puppet says "Oh no, now there are more!" Children explain: still 5, nothing was added or taken away. Count to check.
2. **Spread and squash (8 min).** In pairs: put some cubes (up to 10) on a plate and count them. Then spread them out across the table. "Do you need to count again?" Predict, then count to check. Then push them close together and do the same.
3. **Different order (5 min).** Count the same 7 cubes starting from a different cube. Is it still 7? (Yes.)

✓ Discussion questions (with answers) (3 min)

- When we count, which number tells us how many? The last one.
- I spread the 5 cubes out. How many now? Still 5.
- If I count from the other end, will I get a different answer? No, the same number.
- What would change the number? Adding cubes or taking some away.

✓ Closing check (with answers) (3 min)

Show 8 cubes in a line and count them together. Push them into a pile. "How many?" (8.) Ask a few children to explain why.

Vocabulary

how many, last, the same, spread out, close together, more, fewer

Differentiation

- **Support:** groups up to 5; let the child do the spreading themselves.
- **Stretch:** "I have 7. I take one away and put it back. How many now?" (7.) Or counts up to 15.

⚠ Safety

Use counters too large to swallow.

Teacher notes and misconceptions

- Many young children think a longer line has more things. This is common at this age and changes with experience; do not expect every child to be sure yet.
- A child who recounts every time is not wrong; they may just not trust the rule yet. Keep asking "Do you need to count again?"

Lesson 3: Quick looks

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

About 25 minutes.

Goal

Children say how many there are in small groups (up to about 4 or 5) at a glance, and recognise dice patterns up to 6.

Materials

- Large dot cards: 1 to 6 in dice patterns, and 2 to 5 in scattered patterns.
- Big foam dice; a small die and a ten-frame per pair.

Steps

✎ Opening (5 min)

Flash a dot card for about two seconds, then hide it. "How many did you see?" Start with 2, then 3, then 1. Ask: "Did you count, or did you just know?"

✎ Main activity (17 min)

1. **Flash cards (6 min).** Show dice-pattern cards from 1 to 6 in a random order, each for two seconds. Then show scattered 4 and 5. Ask which were easier.
2. **Roll and build (8 min).** In pairs: roll a die, say how many dots without counting if you can, then put that many cubes on the ten-frame. Partner checks by counting.
3. **Show me fingers (3 min).** "Show me 3 fingers." "Show me 5." "Show me 4 a different way." Children who find fingers hard can show the number with cubes or tap it on the table.

✓ Discussion questions (with answers) (3 min)

- Which cards could you know without counting? Usually the small ones (1 to 4) and the dice patterns, like 5 and 6.
- Why is the dice 6 easy even though it is quite big? It is a pattern we know: two rows of 3.
- Was the scattered 5 harder than the dice 5? Usually yes; the scattered one has no pattern to see.

✓ Closing check (with answers) (3 min)

Flash three cards: dice 3, scattered 2, dice 5. Children show the number with fingers. (Answers: 3, 2, 5. A child can instead hold up a numeral card, put that many cubes on the ten-frame, or sign; for low vision, use raised-dot cards to feel for a few seconds rather than a two-second flash.)

Vocabulary

quick look, pattern, dots, dice, at a glance

Differentiation

- **Support:** only 1 to 3; leave the card up longer.
- **Stretch:** two dice: how many altogether? Say how you saw it ("I saw 3 and 2").

⚠ Safety

No special hazards.

Teacher notes and misconceptions

- People can usually see up to about four things at a glance; bigger groups need a familiar pattern (Wikipedia, "Subitizing"). So scattered 5 or 6 will often need counting, and that is fine.
- Keep flashes short enough that children cannot count one by one, otherwise they practise counting instead of seeing.

Lesson 4: More, fewer or the same?

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

About 25-30 minutes.

Goal

Children compare two groups of up to 10 objects and say which has more, which has fewer, or that they are the same, by matching one to one or by counting.

Materials

- Cubes in two colours; two paper plates per pair.
- Five toy cups and four toy spoons (or pictures) for the opening.

Steps

✎ Opening (5 min)

Put out 5 cups and 4 spoons in a messy pile. "Is there a spoon for every cup?" A child puts one spoon in each cup. One cup is left with no spoon. "There are more cups. There are fewer spoons."

✎ Main activity (18 min)

1. **Match them up (7 min).** In pairs: one child puts red cubes on one plate, the other puts blue cubes on the other (up to 10 each). Line them up side by side, one red next to one blue. Which colour has some left over? That colour has more.
2. **Count to compare (6 min).** Now count each group instead. "Red has 6, blue has 4. Which number is more?" Check by matching.
3. **Make them the same (5 min).** "How can we make the groups the same?" Add to the smaller group or take from the bigger one, then match to check.

✓ Discussion questions (with answers) (3 min)

- Red has 6 and blue has 4. Which has more? Red.
- Which has fewer? Blue.
- If both groups have 5, what do we say? They are the same (equal).
- I have 3 big blocks and 5 tiny beads. Which group has more? The beads (5 is more than 3), even though the blocks are bigger.

✓ Closing check (with answers) (3 min)

Show 7 red cubes and 7 blue cubes spaced out so the blue line looks longer. "Which has more?" (They are the same: 7 and 7.) Ask a child to show by matching.

Vocabulary

more, fewer, the same, equal, match, left over

Differentiation

- **Support:** groups up to 5 with a big difference (5 and 2).
- **Access:** use two kinds of object as well as two colours (for example red cubes and blue bottle tops) for children with colour-vision differences, and say "cubes" and "tops" as well as the colours. Pointing, signing or AAC counts the same as saying.
- **Stretch:** groups that differ by one (8 and 9); "How many more?"

⚠ Safety

Use counters too large to swallow.

Teacher notes and misconceptions

- Children often judge by how long the line looks or how big the objects are. Matching one to one is the strongest way to show the truth.
- "Fewer" is a less familiar word than "less". Model it; accept "less" from children.

Lesson 5: Sort it, count it

Unit overview - Previous: Lesson 4

About 30 minutes.

Goal

Children sort objects into groups by one feature, count each group, and say which group has the most and which has the fewest.

Materials

- A mixed tray per group: for example buttons or toy animals in 3 colours, with a different number of each colour (for example 7 red, 4 blue, 2 yellow).
- 3 hoops or trays per group.
- A large sheet of paper for a class "tower" chart, and cubes.

Steps

✎ Opening (5 min)

Tip out a mixed tray on the carpet. "How could we put these into groups?" Take ideas: colour, size, kind of animal. Choose colour for today.

✎ Main activity (20 min)

1. **Sort (6 min).** In groups, children sort the tray into the hoops by colour. Check: is everything in the right hoop?
2. **Count (6 min).** Count each hoop. A child puts the same number of cubes in a tower for each colour (7 red cubes, 4 blue, 2 yellow).
3. **Compare the towers (5 min).** Stand the towers next to each other. Which is tallest? Which colour has the most? The fewest? Put the towers in order from most to fewest.
4. **Sort a new way (3 min).** Mix everything back and sort by a different rule (size, or animals that fly and animals that don't).

✓ Discussion questions (with answers) (2 min)

Answers for the example tray (7 red, 4 blue, 2 yellow):

- Which colour has the most? Red, 7.
- Which has the fewest? Yellow, 2.
- Put them in order from most to fewest. Red, blue, yellow.
- Can we sort the same things a different way? Yes, for example by size or kind.

✓ Closing check (with answers) (3 min)

Give each group a new small tray (for example 3 cars, 5 balls, 1 doll). They sort, count and tell you which group has the most. (Balls, 5.)

Vocabulary

sort, group, same, different, most, fewest, order

Differentiation

- **Support:** two groups only; fewer objects.
- **Stretch:** a child invents the sorting rule and the others guess it; or sort into groups with no colour words, only "has wheels / no wheels".

⚠ Safety

Use objects too large to swallow.

Teacher notes and misconceptions

- Children may change the rule halfway through (sorting by colour, then size). Ask "What is our rule?" and re-check.
- Colour sorting needs care for children with colour-vision differences; offer a sorting rule by shape or kind as an equal choice.
- The cube towers are a first step towards bar charts, which come later.

Kindergarten Mathematics: Numbers to 20, Making 5 and 10, and Shapes (5 lessons, about 2 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 6 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard.

Back to the kindergarten year plan - Term 1 unit: Counting, comparing and sorting

Big idea

Numbers keep going past 10, and we can write them down with numerals. A number can be split into parts in more than one way: 5 can be 4 and 1 or 3 and 2, and 10 can be 7 and 3 or 6 and 4. Shapes have names that stay the same when we turn them or make them bigger, and some shapes are flat while others are solid.

Outcomes

By the end of the unit most children can:

1. Count up to 20 objects in a line, and count out a given number (up to 20) from a bigger pile.
2. Write the numerals 0 to 10, and match a numeral card to a group (0 means "none"). Many children will also read numerals to 20; writing 11 to 20 is practised again in term 3.
3. Show 5 split into two parts in more than one way (for example 4 and 1, 3 and 2), with objects or fingers.
4. Use a ten-frame to say how many more make 10 (for example "7 and 3 more make 10").
5. Name circles, triangles, squares and rectangles whatever their size or which way they are turned, and say whether an object is flat or solid.

Prior knowledge

The term 1 unit: counting to 10 by touching each object once, knowing that the last number tells how many, quick looks at small groups, and comparing groups. Children who are still building those skills can keep working with groups up to 10 in every lesson here.

Lessons

Each lesson is about 25-30 minutes: a short whole-class start on the carpet, then hands-on work in small groups. Split a lesson over two days if needed.

1. Counting on to 20
2. Writing numbers
3. Ways to make 5
4. Make 10 with a ten-frame
5. Flat and solid shapes

Materials (whole class unless noted)

- Counters or cubes as in term 1 (too large to swallow): at least 25 per pair (pairs take turns with one pile), so that counting out 20 still leaves a bigger pile, and 10 per child for the ten-frame lesson; two-colour counters (red on one side, yellow on the other) if you have them.
- Ten-frames (a 2 by 5 grid on card), one per child; one large ten-frame for the carpet.
- Numeral cards 0 to 20; a number line 0 to 20 on the wall.
- Sand trays, chalkboards or whiteboards and pens for writing numerals.
- A cup for "shake and spill" (lesson 3).
- Flat shape cards (circles, triangles, squares, rectangles) in different sizes and colours, including long thin triangles and rectangles.
- Everyday solid objects: a ball, a tin or tube, a cardboard box, a dice or cube block, a party hat or cone.

Assessment

Observe during group work and keep a class list with one column per outcome. A quick one-to-one check (about 3 minutes per child) during the second week:

- Line up 15 cubes. "How many?" (15.) Then: "Give me 12 from this pile." (12; watch whether the child stops at 12.)
- Show the numeral cards 0, 6 and 9. "Which one means none?" (0.) "Show me 6 cubes." (6.) Ask the child to write 4 and 7 (or trace them, see Differentiation).
- "Here are 5 cubes. Hide some in your hand. How many are hiding?" Repeat once with a different split. (Any correct split, for example 2 showing and 3 hiding.)
- Show a ten-frame with 7. "How many more to make 10?" (3.)
- Show a square turned on its corner and a long thin triangle. "What shapes are these?" (square; triangle.) Hand the child a ball and a circle card. "Which is flat? Which is solid?" (circle flat; ball solid.)

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

Sources

- Common Core State Standards, Kindergarten Counting and Cardinality (read to check what is expected in kindergarten, not to claim alignment): https://www.thecorestandards.org/Math/Content/K/CC/
- K.CC.A.3 write numbers from 0 to 20, with 0 representing a count of no objects; K.CC.B.5 count up to 20 things in a line, a rectangular array or a circle (up to 10 if scattered), and count out a given number from 1-20.
- Common Core, Kindergarten Operations and Algebraic Thinking (read for this unit): https://www.thecorestandards.org/Math/Content/K/OA/
- K.OA.A.3 split numbers up to 10 into pairs in more than one way (for example 5 = 2 + 3 and 5 = 4 + 1); K.OA.A.4 for any number from 1 to 9, find the number that makes 10 when added to it.
- Common Core, Kindergarten Geometry (read for this unit): https://www.thecorestandards.org/Math/Content/K/G/
- K.G.A.2 name shapes regardless of their orientation or overall size; K.G.A.3 identify shapes as two-dimensional ("flat") or three-dimensional ("solid"); K.G.B.5 build and draw shapes.

- Common Core, Kindergarten Number and Operations in Base Ten (read for the year plan): https://www.thecorestandards.org/Math/Content/K/NBT/ - teen numbers as ten ones and some more ones. That idea is left for term 3.

Known gaps and cautions

- Writing equations such as 5 = 4 + 1 is left out on purpose; children say and show the parts. Add written equations if your setting expects them.
- Teen numbers as "ten and some more" (K.NBT.A.1) are planned for term 3, not taught here.
- Only one lesson on shapes. Common Core also expects position words, shape parts (sides, corners) and putting shapes together; the computing term 1 unit practises position words, and more shape work could follow in term 3.
- Numeral writing needs fine motor control that varies a lot at this age. Tracing, sand trays and choosing a card are all fine.
- Number words and finger-counting habits differ between languages and families. Welcome children counting in their home language too.
- The lesson order and timings are my choice, not taken from a source.
- Peer check: GPT-6.1 Terra did a bounded text and answer-key check of the README and lessons 1-5 at e676735 (square/rectangle sort convention, flat/solid test, counter quantities, plain-cube spill, counters instead of fingers, backwards-6 claim); fixed by the author in 51e79eb. Terra then checked that diff and noted lesson 1 cube numbers; lesson 1 now uses pairs taking turns with 25 cubes per pair, which Terra also diff-checked. Not a standards, classroom or full accessibility review.

Lesson 1: Counting on to 20

Unit overview - Next: Lesson 2

About 25-30 minutes.

Goal

Children say the numbers to 20 in order, count up to 20 objects in a line, and count out a given number from a bigger pile.

Materials

- Cubes or counters (at least 25 per pair, so a pile of more than 20 is left to count out from; pairs take turns, so they share one pile).
- The 0-20 number line on the wall.
- A long strip of paper or tape on the floor for lining things up.

Steps

✎ Opening (5 min)

Count together to 10 with a clap on each number, as in term 1. "Our numbers don't stop at 10! Let's keep going." Count on together from 10 to 20 while the teacher points along the number line. Say 11, 12 and 13 slowly; these names are tricky because they don't sound like "ten-one, ten-two".

✎ Main activity (18 min)

1. **Counting train (6 min).** On the carpet, children each add one cube to a long line on the tape while everyone counts. Stop at 20. "How many cubes in our train?" (20.) Take 3 away from the end and count again together. (17.)
2. **Count the line (7 min).** In pairs, one child makes a line of cubes between 10 and 20 long, then the partner counts it by touching each cube once. Do they agree? Put the cubes back and swap jobs.
3. **Get me some (5 min).** The adult says a number ("Get me 14"). The child counts out that many from the pile and stops. Check together.

✓ Discussion questions (with answers)

- What number comes after 10? 11.
- What number comes after 15? 16.
- I counted 12 cubes. If I move them into a circle, how many are there? Still 12 (moving them doesn't change how many).

- When you are getting 14 cubes, how do you know when to stop? When you say "14" (the last number you need).

✓ Closing check (with answers)

Hold up the number line and point to 18. Count together from 10 up to the pointed number. "What number did we stop on?" (18.) Ask: "What comes next?" (19.)

Vocabulary

eleven to twenty, count on, how many, stop

Differentiation

- **Support:** lines up to 12 or 15; count with the adult; line cubes on a printed strip with one box per cube.
- **Stretch:** count out 20 in a scattered pile and check by lining them up; count backwards from 20.

⚠ Safety

Use counters too large to swallow.

Teacher notes and misconceptions

- "Eleven" and "twelve" don't sound like other numbers, and "thirteen" to "nineteen" put the small number first. Expect children to skip or mix up numbers between 11 and 19 (for example 13 and 30).
- Counting out a given number is harder than counting a group that is already there, because the child has to remember the target and stop.

Lesson 2: Writing numbers

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

About 25-30 minutes.

Goal

Children write the numerals 0 to 10, match numeral cards to groups of objects, and know that 0 means "none".

Materials

- Numeral cards 0 to 10 (and 11 to 20 for stretch).
- Sand trays, chalkboards or whiteboards and pens.
- Small plates with groups of 0 to 10 counters.

Steps

✎ Opening (5 min)

Show an empty plate. "How many cookies on my plate?" (None.) "We have a number for none: zero." Write 0 big on the board. Then put 3 counters on the plate and write 3. Draw numerals in the air with big arm movements: 0, 1, 2, 3.

✎ Main activity (18 min)

1. **Sand and board writing (8 min).** Children write numerals 0 to 10 in sand trays or on boards, copying from a card. The adult watches the starting point and direction of each numeral. Choose four or five numerals per day, not all eleven at once.
2. **Match the plate (6 min).** In small groups, plates with 0 to 10 counters are spread out. Children count a plate and place the matching numeral card beside it. One plate is empty (0).
3. **Make my number (4 min).** A child turns over a numeral card; the partner puts that many counters on a ten-frame. Swap.

✓ Discussion questions (with answers)

- What does 0 mean? None, nothing there.
- This plate has 8 counters. Which card goes with it? 8.
- I wrote 6 backwards. Is it still 6? You meant 6, and often people can still tell, but not always; that is why we practise writing it the usual way, so everyone can read it easily.
- Which is more, 7 or 4? 7.

✓ Closing check (with answers)

Each child writes one numeral the teacher says (choose 2, 5 or 9 for different children) and holds it up. Check: does it match? Then ask the whole class to show "zero" fingers. (A closed fist; no fingers up.)

Vocabulary

zero, numeral, number, write, match

Differentiation

- **Support:** trace numerals on cards with dotted lines or sandpaper numerals; choose the right card instead of writing.
- **Stretch:** match plates with 11 to 20 counters to numeral cards 11 to 20.
- Children with limited hand control can build numerals from play dough or point to cards; the goal is knowing the numeral, not neat handwriting.

⚠ Safety

Use counters too large to swallow.

Teacher notes and misconceptions

- Reversed numerals (especially 2, 3, 5, 7 and 9) are very common at this age. Show the correct form calmly; don't mark it as a big mistake.
- Some children think 0 is "not a number". The empty plate helps.

Lesson 3: Ways to make 5

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

About 25-30 minutes.

Goal

Children show that 5 can be split into two parts in more than one way, using fingers, two-colour counters and hiding games.

Materials

- Five two-colour counters and a cup per pair. No two-colour counters? Use five cubes and a sheet of paper with a line down the middle: spill the cubes on the paper and count the cubes on each side of the line.
- Five counters per child for the opening and closing, for children who prefer counters to fingers.
- A puppet or soft toy for the opening.
- A 5-frame (one row of a ten-frame) per child.

Steps

✎ Opening (5 min)

Hold up one hand (children may use 5 counters instead of fingers from the start). "How many fingers?" (5.) Fold down one. "How many are up? How many are down?" (4 up, 1 down.) "4 and 1 make 5." Try 3 and 2. The puppet says "5 is only 4 and 1!" Children help show it another way.

✎ Main activity (18 min)

1. **Shake and spill (8 min).** Pairs put 5 two-colour counters in a cup, shake and spill. Count the red and the yellow (or, with plain cubes, the cubes on each side of the line). "3 red and 2 yellow make 5." Spill again. Children draw or tell their favourite spill.
2. **How many are hiding? (6 min).** One child puts 5 cubes on a 5-frame, then hides some under their hand. The partner says how many are hiding. Lift the hand to check.
3. **Make a record (4 min).** As a class, collect the spills on the board with dots: 5 and 0, 4 and 1, 3 and 2, 2 and 3, 1 and 4, 0 and 5.

✓ Discussion questions (with answers)

- I see 2 red. How many yellow make 5? 3.
- 4 are showing on the 5-frame. How many are hiding? 1.
- Is "3 red and 2 yellow" the same total as "2 red and 3 yellow"? Yes, both make 5.

- Can 5 be 5 red and 0 yellow? Yes; zero yellow is allowed.

✓ Closing check (with answers)

"Show me 5 on your fingers using both hands" (or with 5 counters in two groups). Children may show 3 and 2, 4 and 1, or 5 and 0 (all correct). Ask two children with different ways to show the class.

Vocabulary

and, make, part, hiding, showing, the same total

Differentiation

- **Support:** use 3 and then 4 before 5; keep the counters visible instead of hiding them.
- **Stretch:** ways to make 6 or 7; find all the ways and check none are missing.
- Children who can't fold fingers easily use counters or the 5-frame instead.

⚠ Safety

Use counters too large to swallow. Shake cups gently, low over the table.

Teacher notes and misconceptions

- The goal is seeing parts and wholes, not memorising facts yet.
- Some children recount all 5 every time instead of seeing the parts. That is fine at first; the 5-frame helps them see "one gap" or "two gaps".

Lesson 4: Make 10 with a ten-frame

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

About 25-30 minutes.

Goal

Children use a ten-frame to see how many more make 10, for any number from 1 to 9.

Materials

- A ten-frame and 10 counters per child.
- A large ten-frame for the carpet.
- Ten paper cups or skittles and a soft ball (optional, for step 3).

Steps

✎ Opening (5 min)

Show the big ten-frame, empty. "It has two rows of five boxes. When every box is full, we have 10." Fill it together, counting. Take some away and ask "How many empty boxes?" The empty boxes tell how many more make 10.

✎ Main activity (18 min)

1. **Fill it up (7 min).** Each child puts some counters on their frame (always filling the top row first, left to right). "How many counters? How many more to fill it?" The adult asks a few children each time.
2. **Ten-frame flash (6 min).** The teacher shows the big frame for a few seconds with 6, 8, 9 or 5. Children say how many and how many more make
3. Then show it again to check.
4. **Ten pins (5 min, optional).** Knock down skittles with a soft ball: "4 fell down, so how many are standing?" (6.) Count to check.

✓ Discussion questions (with answers)

- 7 counters are on the frame. How many more make 10? 3.
- The top row is full and the bottom row is empty. How many? 5.
- 9 are on the frame. How many more make 10? 1.
- I need 4 more to fill it. How many are on it now? 6.

✓ Closing check (with answers)

Show the big ten-frame with 8. Children hold up fingers for how many more make 10. (2.) Then show 4. (6.)

Vocabulary

ten-frame, full, empty, how many more, make 10

Differentiation

- **Support:** use one row (a 5-frame) and "how many more make 5"; count the empty boxes one by one.
- **Stretch:** "How many more make 10?" without the frame; two ten-frames for numbers past 10 ("one full frame and 3 more is 13").
- Children who struggle with fingers can point to the matching numeral card.

⚠ Safety

Use counters too large to swallow. If using skittles, roll the ball along the floor, not thrown, and keep a clear space.

Teacher notes and misconceptions

- Filling the top row first, left to right, makes amounts easy to see (6 is "5 and 1 more"). Keep this habit.
- Some children count the empty boxes as well as the counters. Ask "Which ones are counters? Which are empty?"

Lesson 5: Flat and solid shapes

Unit overview - Previous: Lesson 4

About 25-30 minutes. The one-to-one check from the unit overview can run during this lesson and over the following days.

Goal

Children name circles, triangles, squares and rectangles whatever their size or which way they are turned, and sort objects into flat and solid.

Materials

- Flat shape cards in many sizes and colours, including long thin triangles, long thin rectangles and squares turned on a corner.
- Solid objects: a ball, a tin or tube, a cardboard box, a cube block or dice, a party hat or cone.
- Two hoops labelled with a picture: "flat" (a paper shape) and "solid" (a block).
- Straws or sticks and play dough for building (optional).

Steps

✎ Opening (5 min)

Hold up a triangle. "What shape?" (Triangle.) Turn it upside down. "Now?" (Still a triangle.) Show a tiny triangle and a long thin one. "Still triangles? Yes: three straight sides and three corners." Do the same with a square turned on its corner.

✎ Main activity (18 min)

1. **Shape sort (6 min).** In small groups, children sort a mixed pile of shape cards into circles, triangles, squares and rectangles. The adult adds tricky cards (a thin triangle, a tilted square) and asks why. For this sort, squares go in the square group, even though a square is also a special kind of rectangle (see Stretch).
2. **Flat or solid? (6 min).** Pass around solid objects and flat cards. "Is it thin like a card, or is it thick enough to hold all round, like a ball or a box?" Children put each one in the flat hoop or the solid hoop. Name the solids if children are interested: ball (sphere), tin (cylinder), box, dice (cube), party hat (cone).
3. **Build it (6 min).** Make triangles and squares from straws and play dough, or draw them. Count the sides together.

✓ Discussion questions (with answers)

- I turned the square onto its corner. Is it still a square? Yes; turning it doesn't change the shape.

- This triangle is very long and thin. Is it a triangle? Yes; it has three straight sides.
- Is a ball flat or solid? Solid.
- Is a paper circle flat or solid? Flat.
- How many sides does a square have? 4.

✓ Closing check (with answers)

Hold up, one at a time: a tilted square, a big circle, a tin and a thin triangle. Children call out the name and "flat" or "solid". (Square, flat; circle, flat; tin (cylinder), solid; triangle, flat.)

Vocabulary

circle, triangle, square, rectangle, side, corner, flat, solid, turn

Differentiation

- **Support:** start with circles and squares only; feel the edges of shapes with eyes closed.
- **Stretch:** "Is every square a rectangle?" (Yes; a square is a special rectangle with all four sides the same length.) Find shapes around the room.
- Children with limited vision can use raised or cut-out shapes and real objects to feel.

⚠ Safety

Keep straw ends and small play dough pieces away from mouths. Choose solid objects without sharp edges.

Teacher notes and misconceptions

- Many children think a triangle must point upwards and a square on its corner is a "diamond". Show shapes in many positions all year.
- A paper shape is really very thin, not perfectly flat; "flat" is the right everyday word at this age.
- Faces of solids are flat shapes (a box has rectangle faces). Mention it if children notice; it isn't a goal here.

Kindergarten Mathematics: Adding, Taking Away, Teen Numbers and Comparing (5 lessons, about 3 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 6 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard.
>
> Text-checked by two other agents (Gemini 4 Argon, GPT-6.1 Terra); see Known gaps.

New (trial layout): the whole unit on one page, with a picture for each step.

Back to the kindergarten year plan - Term 2 unit: Numbers to 20, making 5 and 10, and shapes

Big idea

Adding is putting things together or getting more; taking away is taking some from a group or splitting it into parts. We can show both with objects, fingers, drawings, claps and acting out, and later with number sentences such as 3 + 2 = 5. The numbers 11 to 19 are a full ten and some more ones. Objects can be longer or shorter, heavier or lighter, and we find out which by putting them side by side or holding them, not just by looking.

Outcomes

By the end of the unit most children can:

1. Act out or use objects to solve a short story problem that adds or takes away, with totals up to 10, and say the answer.
2. Show the same problem in another way: fingers, a drawing, claps, or (for some children) a number sentence such as 4 + 3 = 7.
3. Add and take away within 5 quickly, for example "3 and 2 make 5" and "5 take away 1 is 4", with or without fingers.
4. Build a teen number as a full ten-frame and some more, and say it as "ten and ..." (for example 16 is ten and 6).
5. Compare two objects by length (lining up their ends) and by weight (holding one in each hand or using a balance), and say which is longer, shorter, heavier or lighter.

Prior knowledge

The term 1 and term 2 units: counting to 20, the last number tells how many, ways to make 5, and how many more make 10 on a ten-frame. Children who are still building those skills can work with totals up to 5 in every lesson.

Lessons

Each lesson is about 30 minutes: a short whole-class start on the carpet, then hands-on work in small groups. Split a lesson over two days if needed; the unit runs over about 3 weeks so each idea can be practised again in play and small groups.

1. Putting together
2. Taking away
3. Quick facts within 5
4. Teen numbers: ten and some more
5. Longer, shorter, heavier, lighter

Materials (whole class unless noted)

- Counters or cubes too large to swallow, in two colours: 10 per child (at least 5 red and 3 blue each, for lessons 1 and 2), plus 20 per pair for lesson 4.
- Small toys for acting out stories (for example toy animals or cars): about 10 per group of four, and a blue cloth or paper "pond" for lesson 1.
- Ten-frames: two per pair for lesson 4; one large ten-frame for the carpet.
- Paper cups (one per pair) and dot cards 0 to 5 (two sets per pair, mixed together, so that doubles such as 2 and 2 can come up) for lesson 3.
- Numeral cards 0 to 10 (for pointing answers in lessons 1 to 3) and 10 to 19 (lesson 4).
- Optional for lesson 2: 5 paper or felt apples and a picture of a tree.
- Optional for lesson 4: 20 lolly sticks or straws and a rubber band per pair.
- Whiteboards and pens, or paper and crayons, for drawings.
- For lesson 5, per group of four: four paper strips (yellow 10 cm, blue 15 cm, green 20 cm, red 25 cm), each also marked with a shape so colour is not the only clue (circle on yellow, triangle on blue, square on green, heart on red), a pencil, a crayon and a shoe; two lidded tubs of the same size, one filled with sand (star label) and one with cotton wool (moon label).
- For lesson 5, for the class: a simple bucket balance (or a home-made coat-hanger balance; see lesson 5), a large empty cardboard box and a small tub of sand.
- Masking tape for a start line on each table.

Assessment

Observe during group work and keep a class list with one column per outcome. A quick one-to-one check (about 3-4 minutes per child) during the third week:

- Put 4 toy frogs on a book "log". "4 frogs are on the log. 3 more hop on. How many now?" (7.) The child may use the toys, fingers or count on.
- Give the child 8 cubes. "Take 3 away. How many are left?" (5.)
- "What is 3 and 2?" (5.) "What is 5 take away 1?" (4.) An answer within a few seconds, with or without fingers, counts as quick.
- Show a full ten-frame and 5 loose counters. "How many altogether?" (15.) "Ten and how many more?" (5.)
- Give the green strip (20 cm, square) and the blue strip (15 cm, triangle) from lesson 5, not lined up. "Which is longer? Show me how you know." (Green; the child lines up the ends, or puts them side by side from the same starting point.) Then the star and moon tubs: "Which is heavier?" (The sand tub; check which label it has before you start.)

Pointing, gesture, sign or a communication device all count as answers. Name strips by colour and shape ("the green square strip") for children with colour-vision differences. Record yes, with help or not yet for each part.

Sources

- Common Core State Standards, Kindergarten Operations and Algebraic Thinking (read to check what is expected in kindergarten, not to claim alignment): https://www.thecorestandards.org/Math/Content/K/OA/
- K.OA.A.1 represent addition and subtraction with objects, fingers, mental images, drawings, sounds (for example claps), acting out situations, verbal explanations, expressions, or equations; K.OA.A.2 solve addition and subtraction word problems, and add and subtract within 10; K.OA.A.5 fluently add and subtract within 5.
- Common Core, Kindergarten Number and Operations in Base Ten: https://www.thecorestandards.org/Math/Content/K/NBT/
- K.NBT.A.1 compose and decompose numbers from 11 to 19 into ten ones and some further ones, and record them by a drawing or equation (such as 18 = 10 + 8).
- Common Core, Kindergarten Measurement and Data: https://www.thecorestandards.org/Math/Content/K/MD/
- K.MD.A.1 describe measurable attributes of objects, such as length or weight; K.MD.A.2 directly compare two objects with a measurable attribute in common and describe the difference (its example compares the heights of two children).

Known gaps and cautions

- Story problems here are mostly "add to" and "take from" with the result unknown. Problems where the start or change is unknown ("Some birds were there, 2 more came, now there are 5; how many were there at first?") are harder and are only a stretch here.
- Number sentences (+, - and =) are shown by the teacher and read together; writing them is optional. Add more written work if your setting expects it.
- English teen-number words hide the ten ("fourteen" says the 4 first, and "eleven" and "twelve" do not sound like "ten and 1" or "ten and 2"). Many other languages say teen numbers more regularly. Welcome counting in home languages.
- Measuring with units (counting how many cubes long) is not taught here; this unit only compares two objects directly.
- Pouring to compare how much containers hold is only a stretch activity (lesson 5), because it needs water or sand play set up.
- The Common Core example compares two children's heights. This unit compares objects instead, so that no child's body is compared in front of the class.
- The lesson order and timings are my choice, not taken from a source.
- Peer check: Gemini 4 Argon did a bounded text, answer-key and timing check on 6 November 2026 at 0f3aeb0 (recorded in PEERCHECKS.md); fixes are in 4abff39, which Argon also diff-checked the same day.
- Peer check: GPT-6.1 Terra did a bounded text and activity check on 9 November 2026 at 5c3db56 (recorded in PEERCHECKS.md); Terra's three lesson 5 points are fixed in aeb39b7, which Terra also diff-checked the same day (see PEERCHECKS.md); Terra's one residual note (check beforehand that the sand tub is heavier; adult-set-up stable balance) is fixed in c974026, and a follow-up (use a scale if the box does not fit the balance) in 131c037.

Lesson 1: Putting together

Unit overview - Next: Lesson 2

About 30 minutes.

Goal

Children act out and solve short story problems where more are added or two groups are put together, with totals up to 10.

Materials

- About 10 small toys per group of four (toy animals or cars).
- A blue cloth or paper "pond" for the carpet.
- Counters in two colours (10 per child, at least 5 red and 3 blue) and whiteboards or paper.

Steps

✎ Opening (5 min)

Tell a story and let children act it out. "3 ducks are on the pond." Three children stand on the blue cloth. "2 more ducks come." Two more join. "How many ducks now?" Count together: 5. Say: "3 and 2 more make 5."

✎ Main activity (20 min)

1. **Toy stories (8 min).** In groups, an adult tells stories with the toys: "4 cows are in the field. 2 more come. How many now?" (6.) "5 cars are in the car park. 3 more drive in." (8.) Children move the toys and count.
2. **Two groups together (7 min).** "Here are 4 red counters and 3 blue counters. How many counters altogether?" (7.) Children push the two groups together and count. Some will count on from 4 ("5, 6, 7"); praise both ways.
3. **Clap it, draw it (5 min).** "Clap 2 times. Now clap 3 more. How many claps?" (5.) Then children draw one story: dots or simple shapes are fine. The teacher writes the number sentence under one drawing, for example 4 + 2 = 6, and reads it: "4 and 2 make 6."

✓ Discussion questions (with answers)

- How did you find out how many there were altogether? Counting all, counting on from the first group, or fingers are all good answers.
- 4 cows and 2 more. Is the answer more or less than 4? More; we added some.
- Does it matter if we put the red counters first or the blue ones? No, 4 and 3 make 7, and 3 and 4 make 7.

✓ Closing check (with answers)

"6 bears are at the picnic. 2 more come. Show me how many with your fingers." (8.) Then: "I clap 1 time, then 4 more times. How many claps?" (5.)

Vocabulary

add, more, altogether, and, make, put together

Differentiation

- **Support:** totals up to 5; the adult moves the toys while the child counts.
- **Stretch:** a "start unknown" story: "Some birds sat on a fence. 2 more came. Now there are 5. How many were there at first?" (3.) Or reading the number sentence on the board.
- Children who do not want to act on the carpet can move toys instead. Pointing to numeral cards counts as an answer.
- Any child can show answers with counters, numeral cards or taps on the table instead of fingers or claps.

⚠ Safety

Use toys and counters too large to swallow. Keep acting-out moves to walking on the carpet.

Teacher notes and misconceptions

- Some children recount everything from 1 each time. That is fine at this stage; counting on is a later habit, so show it but do not insist.
- Children sometimes count the first group twice when they push groups together. Ask them to touch each one once, as in term 1.

Lesson 2: Taking away

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

About 30 minutes.

Goal

Children act out and solve story problems where some are taken away, or a group is split into two parts, starting from up to 10.

Materials

- About 10 small toys per group of four.
- Counters in two colours (10 per child, at least 5 red and 3 blue) and whiteboards or paper.
- 5 paper or felt apples and a picture of a tree (optional, for the opening).

Steps

✎ Opening (5 min)

"5 apples are on the tree." Put 5 apples on the tree picture. "The wind blows and 2 fall down." Take 2 away. "How many are still on the tree?" (3.) Say: "5 take away 2 is 3."

✎ Main activity (20 min)

1. **Toy stories (8 min).** "9 birds are on a wall. 4 fly away. How many are still on the wall?" (5.) "7 cars are in the car park. 2 drive away." (5.) "6 frogs are on a log. 6 jump in the water." (0; no frogs are left.) Children move the toys away and count what is left.
2. **Split it (7 min).** "Here are 6 toy animals. 2 are cats and the rest are dogs. How many dogs?" (4.) Children sort the toys into two groups and count each group. Do the same with 8 counters: 5 red and the rest blue. (3 blue.)
3. **Draw and cross out (5 min).** Children draw 7 circles and cross out 3. "How many are not crossed out?" (4.) The teacher writes 7 - 3 = 4 and reads it: "7 take away 3 is 4."

✓ Discussion questions (with answers)

- When we take some away, do we have more or fewer than before? Fewer.
- How did you find how many were left? Counting what was left, counting back, or fingers are all good answers.
- 6 frogs, and 6 jump away. How many are left? None, which is 0.

✓ Closing check (with answers)

"8 cars are in the car park. 3 drive away. Show me with your fingers how many are left." (5.)
Then: "10 balloons, 1 pops. How many now?" (9.)

Vocabulary

take away, left, fewer, none, zero, split

Differentiation

- **Support:** start from 5 or fewer; the child takes the toys away one at a time while counting.
- **Stretch:** "I had some sweets and ate 2. Now I have 3. How many did I have at first?" (5.) Or reading the number sentence on the board.
- Children may point to numeral cards or sign answers.
- Any child can show answers with counters, numeral cards or taps on the table instead of fingers or claps.

⚠ Safety

Use toys and counters too large to swallow.

Teacher notes and misconceptions

- Some children count the toys that went away instead of the ones left. Ask "Which ones are still here?" and point to them.
- Stories with food or animals should avoid upsetting events. Wind, flying away and driving away work well.

Lesson 3: Quick facts within 5

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

About 30 minutes.

Goal

Children add and take away within 5 quickly, using fingers, quick looks and the ways to make 5 from term 2.

Materials

- 5 counters and a paper cup per pair.
- Dot cards showing 0 to 5 dots (two sets per pair, mixed together, so that doubles such as 2 and 2 can come up).
- Numeral cards 0 to 5 for children who prefer to point.

Steps

✎ Opening (5 min)

Fingers warm-up: "Show me 3 fingers. Now 1 more. How many?" (4.) "Show me 5. Put 2 down. How many are up?" (3.) Go quickly; it is fine to look at your fingers.

✎ Main activity (20 min)

1. **Hide and show (8 min).** In pairs, one child puts 5 counters on the table, then hides some under the cup while the partner closes their eyes. The partner looks at what is left: "3 are showing, so 2 are hiding." Lift the cup to check. Swap roles. Then play with 4 counters.
2. **Dot card add (7 min).** Each child turns over two dot cards (for example 2 dots and 3 dots) and says the total (5). If the total is more than 5, put the cards back and try again.
3. **Quick quiz (5 min).** The teacher calls out facts and children show the answer with fingers: 2 and 2 (4), 1 and 3 (4), 4 and 1 (5), 5 take away 2 (3), 4 take away 1 (3), 5 take away 5 (0). The teacher writes two of them as number sentences, for example 2 + 2 = 4 and 5 - 2 = 3.

✓ Discussion questions (with answers)

- 3 counters are showing out of 5. How did you know 2 were hiding? We know 3 and 2 make 5; or we counted on from 3 to 5.
- Is 1 and 4 the same as 4 and 1? Yes, both make 5.
- What is 4 take away 0? 4; nothing was taken.

✓ Closing check (with answers)

Children show fingers: "3 and 1?" (4.) "5 take away 3?" (2.) "2 and 3?" (5.)

Vocabulary

and, make, take away, the same as, hiding, showing

Differentiation

- **Support:** play hide and show with 3 counters; use the numeral cards.
- **Stretch:** hide and show with 10 counters (links to make 10 in term 2).
- "Quick" means a few seconds, not a race. Do not time children or make the quiz a competition.
- Any child can show answers with counters, numeral cards or taps on the table instead of fingers or claps.
- Instead of closing their eyes, the partner can turn away, or the child can hide counters behind a card screen.

⚠ Safety

Use counters too large to swallow.

Teacher notes and misconceptions

- Children who already know a fact "by heart" still benefit from showing it with fingers or counters now and then.
- Short, frequent practice (a few facts a day in the rest of the term) helps more than one long session.

Lesson 4: Teen numbers: ten and some more

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

About 30 minutes.

Goal

Children build numbers from 11 to 19 as one full ten-frame and some more ones, and say them as "ten and ...".

Materials

- Two ten-frames and 20 counters per pair.
- A large pair of ten-frames for the carpet.
- Numeral cards 10 to 19.
- Optional: 20 lolly sticks or straws and a rubber band per pair, to make a bundle of ten.

Steps

✎ Opening (5 min)

Fill the big ten-frame, counting together to 10. "It is full. That is ten." Put 3 more counters on the second frame. "Ten and 3 more. Let's count on: 11, 12, 13. Ten and 3 is 13." Show the numeral card 13: "The 1 is for the full ten, and the 3 is for the 3 more." Write 13 = 10 + 3 on the board.

✎ Main activity (20 min)

1. **Build it (8 min).** The adult shows a numeral card from 11 to 19. Pairs fill the first frame to 10 and put the rest on the second frame. "What is 16?" (Ten and 6.) "What is 19?" (Ten and 9.) "What is 11?" (Ten and 1.)
2. **What number is it? (7 min).** The adult builds a full frame and some more. Children say the number: ten and 7 (17), ten and 4 (14), ten and 8 (18). Children who can, find the numeral card.
3. **Bundle of ten (5 min, optional).** Pairs count 10 sticks, put a rubber band round them, and add some loose sticks. "One bundle of ten and 5 loose sticks. How many?" (15.)

✓ Discussion questions (with answers)

- How do we know the first frame has 10 without counting? Every box is full, and a full frame is always 10.
- In the number 14, what does the 4 tell us? 4 more ones after the ten.
- Which is more: ten and 2, or ten and 8? Ten and 8 (18 is more than 12).

✓ Closing check (with answers)

Show a full frame and 6 more. "How many?" (16.) Then: "Show me ten and 2 with your counters." (A full frame and 2 more; 12.)

Vocabulary

ten, full, ones, ten and ..., teen numbers

Differentiation

- **Support:** start with 11, 12 and 13; count every counter from 1 and then say "ten and ...".
- **Stretch:** "What is 10 + 8?" without counters (18); or "18 is ten and how many?" (8.)
- Children who find fine motor work hard can use larger counters, or point while a partner places them.

⚠ Safety

Use counters too large to swallow. Rubber bands: an adult puts them on, and they are collected at the end.

Teacher notes and misconceptions

- In English, "fourteen" says the 4 first but we write 1 then 4, and "eleven" and "twelve" don't sound like ten and 1 or ten and 2. Expect reversals such as writing 41 for fourteen; showing ten and 4 on frames helps.
- Always fill the first frame completely before using the second, so the ten is easy to see.
- Some children think the 1 in 14 means one counter. The full ten-frame is what that 1 stands for; this is the start of place value, not the whole idea.

Lesson 5: Longer, shorter, heavier, lighter

Unit overview - Previous: Lesson 4

About 30 minutes.

Goal

Children compare two objects by length and by weight, by lining them up or holding them, and use the words longer, shorter, heavier and lighter.

Materials

Per group of four:

- Four paper strips in different colours and clearly different lengths: red 25 cm, blue 15 cm, green 20 cm, yellow 10 cm. Also draw a shape on each so colour is not the only clue: circle on yellow, triangle on blue, square on green, heart on red.
- A pencil, a crayon and a shoe.
- Masking tape stuck down along one edge of the table as a start line.
- Two lidded tubs of the same size: one full of sand (labelled with a star) and one full of cotton wool (labelled with a moon). Fill and close them before the lesson.

For the class:

- A simple bucket balance. If you do not have one, make one: hang a coat hanger from a hook or a broom handle held across two chairs, and tie a plastic bag or cup to each end at the same distance from the middle. Check it hangs level when empty. An adult sets it up so it is stable and cannot fall on children.
- A large empty cardboard box and a small tub of sand, for the opening.

Steps

✎ Opening (5 min)

Hold up the green strip (20 cm) and the blue strip (15 cm), with the green one held lower so the tops are uneven. "Which is longer?" Take guesses. Then put both on the floor with their ends on the same line. "Now we can see: the green strip is longer. To compare, we start them at the same place."

✎ Main activity (20 min)

1. **Start at the line (7 min).** Groups put two strips at a time on the start line and say which is longer and which is shorter. Then they put all four in order, shortest to longest (yellow, blue, green, red). Then they compare the pencil, the crayon and the shoe the same way, and say what they found (answers depend on the objects; any comparison made from the start line is right).

2. **Hold and feel (7 min).** Each child holds the star tub in one hand and the moon tub in the other. "Which is heavier? Which is lighter?" (The star tub, with sand, is heavier.) "They are the same size. Can you tell which is heavier just by looking?" (No; we had to hold them.)
3. **Balance (6 min, whole class).** Show the big empty box and the small tub of sand. "Which is heavier?" Take guesses, then put them in the balance. The side that goes down is heavier (usually the small sand tub). If the box is too big for your balance, children take turns holding the box in one hand and the sand tub in the other instead. Before the lesson, check that your sand tub really is heavier than the empty box (on the balance if the box fits, otherwise on a kitchen scale or a bigger balance); if not, add more sand or use a lighter box. "The bigger one is not always the heavier one."

✓ Discussion questions (with answers)

- Why do we put the strips on the same start line? So we compare the lengths fairly; if one starts further along, it can look longer when it is not.
- How can we find out which tub is heavier? Hold one in each hand, or use a balance.
- On a balance, which side is heavier? The side that goes down.

✓ Closing check (with answers)

Hold up the red strip (25 cm) and the yellow strip (10 cm) and line them up on the start line in front of the children. "Which is shorter?" (Yellow.) Then a child holds the star and moon tubs. "Which is lighter?" (The moon tub, with cotton wool.)

Vocabulary

longer, shorter, heavier, lighter, the same, start line, balance, compare

Differentiation

- **Support:** compare just two strips with a large difference (red and yellow).
- **Stretch:** pouring play: which of two containers holds more? Fill one with sand or water and pour it into the other. If it overflows, the first held more. If it does not overflow, that does not yet show which holds more: fill the second container and pour it back into the first. If that overflows, the second holds more; if neither overflows and each one fills the other, they hold about the same. A tall thin bottle and a short wide bowl often surprise children.
- Children who cannot hold the tubs can have each tub rested on their lap or palm in turn (a helper holds it steady), or watch the balance and say which side went down. (Pushing tubs along a table is not a fair way to compare weight: the tubs may slide differently.) Children with low vision can compare strips by touch, with ends lined up against the tape.
- For children with colour-vision differences, name strips by colour and shape ("the green square strip").

⚠ Safety

Keep the tubs light enough for a child to hold easily (a small yogurt-pot size of sand is enough) and check the lids are taped on. For pouring play, put down towels and wipe up spills at once so nobody slips. Keep sand away from faces.

Teacher notes and misconceptions

- Children often judge length by where an object ends, not by where it starts. The start line is the key habit here.
- Many children think bigger always means heavier. The box and sand tub show that this is not always true.
- Compare objects, not children. Comparing children's heights in front of the class can upset some children.