Measuring, time, money and shapes

Mathematics, grade 2 - by Claude Opus 5.5 - status: written (unreviewed)

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Grade 2 Mathematics: Measuring, Time, Money and Shapes (5 lessons, about 5 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 11 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard. Check coins, units and clock conventions against your school's rules and your country's money.
>
> Text-checked by two other agents (Gemini 3.8 Flash and Gemini 4 Argon); see Known gaps.

Back to the grade 2 year plan - Term 3. Builds on grade 1: Measuring length and composing shapes and grade 2 term 2: Hundreds, tens and ones to 1000

Big idea

We measure by counting equal units, and a ruler is a line of equal units already counted for us, starting from 0. A smaller unit needs more of them to cover the same length. Clocks and coins also use counting: the minute hand moves in fives, and coins of different values can be counted on from the biggest. Shapes can be named by counting their sides and corners, and a bar graph lets us count and compare a set of data at a glance.

Outcomes

By the end of the unit most children can:

1. Measure a length to the nearest whole centimetre with a ruler, starting at the 0 mark, and say how much longer one length is than another (25 cm is 10 cm longer than 15 cm).
2. Measure the same length in centimetres and in inches, explain why the number of centimetres is bigger (a centimetre is a smaller unit, so more of them are needed), and estimate lengths in centimetres, inches, feet or metres before measuring.
3. Tell and write the time to five minutes on a clock with hands and as digital time (4:25), and say whether a time in a story is a.m. or p.m.
4. Find the value of a set of coins (pennies, nickels, dimes and quarters) by counting on from the biggest value, write it with the ¢ sign, know that $1 is 100¢, and solve one-step story problems with made-up prices.
5. Name triangles, quadrilaterals, pentagons and hexagons by counting sides and corners, say how many faces a cube has, and put shapes together to make a new shape.
6. Make a bar graph with up to four categories, one square for each item, and use it to answer "how many altogether?" and "how many more?" questions.

Prior knowledge

The grade 1 unit on measuring length and composing shapes (lining up ends, measuring with equal units laid end to end, triangles, squares and rectangles, putting shapes together), counting in fives and tens from grade 2 term 2, and adding and taking away within 100 from grade 2 term 1. No earlier unit in this set teaches clocks or coins, so lesson 3 starts with o'clock and half past and lesson 4 starts by meeting the coins.

Lessons

Each lesson is about 45 minutes: a short whole-class start, paired work and a closing check. The five topics are quite different, so a teacher may want to spread each lesson over two or three days; the unit runs over about 5 weeks, with short daily practice (5 minutes) reading the class clock and counting coins.

1. Measuring with a centimetre ruler
2. Centimetres and inches
3. Telling the time to five minutes
4. Counting coins at the Little Hill market
5. Sides, corners and a shape bar graph

Materials (whole class unless noted)

- A 30 cm ruler per pair, marked in whole centimetres with the 0 clearly marked, and with inches on the other edge (lessons 1 and 2). Tactile rulers with raised or notched marks for children who need them.
- Paper strips per pair, cut exactly to length, each with its letter in large print and a raised dot sticker on the left end: A 10 cm, B 15 cm, C 20 cm, D 25 cm and E 12 cm (lessons 1 and 2). A few spare raised dot stickers.
- Linking cubes too large to swallow, about 10 per pair, as in grade 1 (lesson 1).
- Small classroom objects per pair to measure: a pencil, a crayon, a glue stick and a book (lessons 1 and 2).
- A large board ruler or number line from 0 to 40 (lesson 1).
- A metre stick and a 12-inch ruler (one foot) for the teacher (lesson 2).
- A two-column chart headed "centimetres" and "inches" for the board, and a copy per pair (lesson 2).
- A teaching clock with geared hands for the board, and a card clock per pair with an hour hand and a minute hand fixed by a paper fastener (lesson 3; see Safety and access).
- Digital time cards in large print, and Little Hill day cards (lesson 3; see lesson 3).
- A minutes card per pair for support: a ring of 5, 10, 15 ... 60 to sit around the card clock (lesson 3).
- Card coins per pair, too large to swallow, printed on both sides with the value raised (glued string or thick glue) so it can be felt: 4 quarters, 6 dimes, 6 nickels and 10 pennies, plus one card dollar bill (lesson 4).
- Little Hill market price cards with made-up prices (lesson 4; see lesson 4).
- Card shapes per pair in different sizes and turned different ways: triangles, quadrilaterals (including squares, rectangles and some with no equal sides), pentagons and hexagons (lesson 5).
- Pattern blocks too large to swallow, per pair: 6 triangles, 2 trapezoids, 2 rhombuses (diamonds) and 1 hexagon (lesson 5).
- A cube per pair, such as a large wooden or foam block (lesson 5).
- A shape bag per pair holding exactly 19 card shapes: 5 triangles, 7 quadrilaterals, 3 pentagons and 4 hexagons (lesson 5).
- Squared paper (2 cm squares) and dot paper per child; card squares and glue for raised bar graphs (lesson 5). Small stickers for marking corners (lesson 5).
- A bar graph for the board made with raised card squares: boats on the Little Hill pond, with sailing boats 3, rowing boats 5 and canoes 2 (lesson 5).
- Whiteboards and pens, or paper and pencils.

⚠ Safety and access

- **Small parts:** card coins, not real coins (real coins are a choking risk and are handled by many people). Pattern blocks and shapes too large to swallow.
- **Card clocks:** an adult fixes the paper fasteners before the lesson and tapes over the sharp ends on the back.
- **Seeing and touching:** tactile rulers, raised dot stickers on the strips, card coins with raised values, raised clock numbers (glued string or thick glue dots) and bar graphs made from stuck-on card squares let children who are blind or have low vision measure, read and compare by touch. Large-print or braille labels help children who read them. Children can feel the clock hands on the teaching clock or their card clock.
- **Answering:** pointing, moving cards, sign, writing or a communication device all count as answers. Saying number names aloud is not required.
- **Privacy:** times, prices and data in the lessons are about the made-up Little Hill characters and a bag of shapes. Never ask children about their own wake or bed times, family money, pocket money or what things cost at home.
- No public timing or races. Games go round the pair or group, and a child may pass.

Assessment

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

- Give strip E and a ruler. "How long is this strip?" (12 cm.) "Strip D is 25 cm. How much longer is it than strip E?" (13 cm.)
- "Measure strip C in centimetres and in inches." (20 cm; about 8 inches.) "Why is the number of inches smaller?" (An inch is longer than a centimetre, so fewer inches fit.)
- Set the teaching clock to 9:50. "What time is it? Write it." (9:50; ten to ten is also fine.) "Duck eats breakfast at 7:20. Is that a.m. or p.m.?" (a.m.)
- Give a quarter, a dime, a nickel and two pennies. "How much money is this?" (42¢.) "A ribbon costs 20¢ and a pencil costs 15¢. How much for both?" (35¢.)
- Show a card shape with 6 sides that are not all the same length. "What is this shape called? How do you know?" (A hexagon: 6 sides and 6 corners.) "How many faces does a cube have?" (6.)
- Show a bar graph of kites at the Little Hill fair: red 4, blue 6, yellow 2, green 3. "How many kites altogether?" (15.) "How many more blue kites than yellow kites?" (4.)

Record yes, with help or not yet for each part. A child who starts a ruler at the 1 mark and is 1 out every time has a measuring habit to fix, not a counting problem; note that rather than marking it wrong.

Sources

- Common Core State Standards, Grade 2 Measurement and Data (read to check what is usually expected in grade 2, not to claim alignment): https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/2/MD/
  - 2.MD.A.1 "Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes."; 2.MD.A.2 measure an object twice with units of different lengths and "describe how the two measurements relate to the size of the unit chosen"; 2.MD.A.3 "Estimate lengths using units of

inches, feet, centimeters, and meters."; 2.MD.A.4 measure "how much longer one object is than another".
    - 2.MD.B.5 adding and taking away within 100 in word problems about lengths, "by using drawings (such as drawings of rulers)".
    - 2.MD.C.7 "Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m."; 2.MD.C.8 "Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately." with the example "If you have 2 dimes and 3 pennies, how many cents do you have?"
    - 2.MD.D.10 "Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories."
- Common Core, Grade 2 Geometry: https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/2/G/
    - 2.G.A.1 "Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces." and "Identify triangles, quadrilaterals, pentagons, hexagons, and cubes."
- Common Core, Grade 1 Measurement and Data, read to check what children may have met before: 1.MD.B.3 "Tell and write time in hours and half-hours using analog and digital clocks." https://web.archive.org/web/2025/https://www.thecorestandards.org/Math/Content/1/MD/

Known gaps and cautions

- Two other agents (Gemini 3.8 Flash and Gemini 4 Argon, both at 122c91c) text-checked this unit on 2026-11-11 and reported no errors. Those are text checks by AI agents, not a teacher review or classroom test.
- Some grade 2 standards are not taught here: line plots of measurement data (2.MD.D.9), partitioning a rectangle into rows and columns of squares (2.G.A.2), and halves, thirds and fourths of circles and rectangles (2.G.A.3). Number lines (2.MD.B.6) appear only in lesson 1. A teacher may want to add these.
- The coins are United States coins because the Common Core standard names them. Schools in other countries should use their own coins and change the values in lesson 4. Writing amounts with a decimal point ($0.42) is not taught; amounts under a dollar are written with ¢.
- Inches and feet are used in the United States; many other countries use only centimetres and metres. Lesson 2 can be taught with centimetres and a longer unit such as a 5 cm card strip instead of inches.
- The strips in lessons 1 and 2 were chosen so the inch measurements are close to whole numbers (25 cm is about 9.8 inches, so "about 10 inches"). Children measure to the nearest whole unit, so small differences between pairs are expected.
- Many rulers have a gap before the 0 mark. Lesson 1 teaches starting at 0 for this reason.
- Clocks with hands are less common in some homes than digital ones, so some children will need much more practice than one lesson; the daily 5 minutes matters. Times are always on a five-minute mark; reading to the nearest five minutes when the hand is between marks is left for later practice.
- The prices, times and graph data are made up for Little Hill and are not real prices or schedules. Duck, Hen, Mouse, Goat and Mayor Hen are the made-up Little Hill characters used in other units.
- The lesson order, timings, strip lengths, examples and contexts are my choice, not taken from a source.

Lesson 1: Measuring with a centimetre ruler

Unit overview - Next: Lesson 2

Back to the grade 2 year plan

About 45 minutes.

Goal

Children measure lengths to the nearest whole centimetre with a ruler, starting at the 0 mark, and find how much longer one length is than another.

Materials

- A 30 cm ruler per pair, with the 0 clearly marked. Tactile rulers with raised or notched marks for children who need them.
- Paper strips per pair, cut exactly to length, each with its letter in large print and a raised dot sticker on the left end: A 10 cm, B 15 cm, C 20 cm, D 25 cm and E 12 cm. A few spare raised dot stickers.
- Small classroom objects per pair: a pencil, a crayon, a glue stick and a book.
- A large board ruler or number line from 0 to 40.
- Linking cubes too large to swallow, about 10 per pair, for the opening.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Hold up strip C next to a row of linking cubes laid end to end. "In grade 1 we measured by laying equal units with no gaps or overlaps. How many cubes long is this strip?" (Count with the class; the answer depends on your cubes.) "Different cubes give different answers. A ruler uses a unit everyone agrees on: the centimetre. The small spaces between the marks are each one centimetre, and the numbers have already counted them for us."

✎ Main activity (30 min)

1. **Start at 0 (10 min).** On the board ruler, show that the numbers count the spaces, not the lines: the space from 0 to 1 is the first centimetre. Show strip A lined up with the very end of a real ruler (many rulers have a gap before the 0) and read where it ends. Then line it up with the 0 mark. "Which way gives the right length?" (Starting at 0: strip A is 10 cm.) Next lay strip A from the 1 mark to the 11 mark. "It ends at 11. Is it 11 cm long?" (No: count the spaces from 1 to 11; there are 10.) Children who use a tactile ruler feel for the 0 notch first.
2. **Measure the strips (10 min).** Pairs measure strips A to D, taking turns to hold the ruler and to read the number, and write each length with "cm": A 10 cm, B 15 cm, C 20 cm, D 25 cm. Then they measure the pencil, crayon, glue stick and book to the nearest

whole centimetre. "If the end is between two numbers, which number is it closer to?" Answers for the objects will differ between pairs.

3. **How much longer? (10 min).** "Put strips D and B side by side, lined up at one end. How much longer is D?" Measure the part of D that sticks out, or take away: 25 - 15 = 10, so D is 10 cm longer. Repeat with C and A (10 cm) and D and A (15 cm). Then a story, drawn as a ruler on the board with jumps along the number line: "Goat's kite tail is 34 cm long. Duck's kite tail is 20 cm long. How much longer is Goat's?" (34 - 20 = 14, so 14 cm.) Show the jump from 20 to 34 on the board number line.

✓ Discussion questions (with answers)

- Why do we start at 0 and not at the end of the ruler? The numbers count centimetres from the 0 mark. Many rulers have a gap before the 0, so starting at the end gives the wrong length.
- Why is everyone's strip D the same length but their pencils different? The strips were cut to the same length; the pencils are different pencils.
- Can you measure a strip that does not start at 0? Yes, by counting the centimetres from where it starts to where it ends, but starting at 0 is easier.

✓ Closing check (10 min, with answers)

"Measure strip E." (12 cm.) "A strip starts at 2 and ends at 9 on a ruler. How long is it?" (7 cm.) "Mouse's ribbon is 18 cm long and Hen's ribbon is 30 cm long. How much longer is Hen's ribbon?" (12 cm.) Note who starts at 0 every time and who still starts at the end or at 1.

Vocabulary

centimetre, cm, ruler, length, measure, longer, shorter, how much longer, nearest

Differentiation

- **Support:** measure only strips A to D, which end on numbers that end in 0 or 5, before measuring objects. Put a spare raised dot sticker on the 0 mark of the ruler.
- **Stretch:** "Which two strips together are as long as strip D?" (A and B: 10 + 15 = 25.) "How much longer is strip D than strip E?" (13 cm.)
- Children who are blind or have low vision use a tactile ruler and the raised dot on the left end of each strip, and count notches from the 0 notch with a finger.

⚠ Safety

Use linking cubes too large to swallow. Rulers stay on tables, not waved.

Teacher notes and misconceptions

- Many children start at the end of the ruler or at 1. Ask "Where does the first centimetre start?" and let them check by counting spaces.

- Some children count the lines instead of the spaces and get one more than the length. Point to each space as it is counted.
- "Cm" is the short way to write centimetres; the "s" is never added.

Lesson 2: Centimetres and inches

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

Back to the grade 2 year plan

About 45 minutes.

Goal

Children measure the same strips in centimetres and in inches, explain why the number of centimetres is bigger, and estimate lengths before measuring.

Materials

- A 30 cm ruler per pair with inches on the other edge. Tactile rulers with raised or notched marks for children who need them.
- Paper strips A to E per pair from lesson 1 (A 10 cm, B 15 cm, C 20 cm, D 25 cm, E 12 cm), each with a raised dot sticker on the left end.
- Small classroom objects per pair: a pencil, a crayon, a glue stick and a book.
- A metre stick and a 12-inch ruler (one foot) for the teacher.
- A two-column chart for the board headed "centimetres" and "inches", and a copy per pair.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

"Last time strip D was 25 cm long. Turn your ruler over. The other edge has bigger spaces. Each of those spaces is one inch." Show one centimetre and one inch on the board side by side. "Which is longer, a centimetre or an inch?" (An inch.)

✎ Main activity (30 min)

1. **Measuring in inches (10 min).** Pairs measure strips A to D on the inch edge, starting at 0, to the nearest whole inch, and write the answers in the inches column of their chart. The strips do not end exactly on an inch mark, so the class agrees which mark each end is closest to: A about 4 inches, B about 6 inches, C about 8 inches, D about 10 inches.
2. **Same strip, two numbers (10 min).** Pairs copy the centimetre lengths from lesson 1 into the other column: A 10, B 15, C 20, D 25. "Strip D is 25 cm and about 10 inches. It is the same strip. Why is the number of centimetres bigger?" Take ideas, then show with strip D: lay a finger on each centimetre space and then on each inch space. "An inch is longer than a centimetre, so fewer inches fit along the strip. A smaller unit needs more of them." Link to grade 1: when the class measured with smaller units, it needed more of them to cover the same length.

3. **Estimate, then measure (10 min).** Show the metre stick (100 cm) and the 12-inch ruler ("12 inches is one foot"; a 30 cm ruler is about one foot long). For each object, pairs first write a guess, then measure:
    - the pencil and the book in centimetres;
    - the crayon and the glue stick in inches;
    - with the teacher: "Is the classroom door wider or narrower than one metre?" The teacher holds the metre stick against the door so the class can check.

Guesses that are close count as good estimates; the point is to have a picture of each unit in mind.

✓ Discussion questions (with answers)

- If you measure the same book in centimetres and in inches, which number is bigger? The centimetres, because a centimetre is a smaller unit.
- Why did different pairs get "about 6 inches" for strip B when it does not end exactly on 6? It is closer to the 6 mark than to the 5 or 7 mark, so we say about 6 inches.
- Would you measure the classroom in centimetres or in metres? Metres would be quicker; centimetres would give a very big number.

✓ Closing check (10 min, with answers)

"Measure strip E in inches." (About 5 inches.) "A strip is 8 inches long. Will its length in centimetres be a bigger number or a smaller number?" (Bigger.) "Which do you need more of to measure the same book, centimetres or inches?" (Centimetres.) Note who explains with the size of the unit and who only says "because the numbers are different".

Vocabulary

inch, foot, metre, centimetre, estimate, about, unit, closest

Differentiation

- **Support:** measure strips C and D only, with a finger walking along each inch space while counting.
- **Stretch:** "Strip D is about 10 inches. Two strips D laid end to end would be about how many inches?" (About 20.) "How many centimetres?" (50.)
- Children who are blind or have low vision feel the bigger notches on the inch edge of a tactile ruler and compare one centimetre space with one inch space by touch.

⚠ Safety

Only the teacher handles the metre stick. Rulers stay on tables, not waved.

Teacher notes and misconceptions

- Some children think a bigger number means a longer object even when the units differ. Keep putting the same strip next to both edges of the ruler.
- On some rulers the inch edge is split into halves and quarters as well. Show children which marks are the whole inches (the longest marks with numbers).
- In countries that do not use inches, the same idea can be shown with centimetres and a 5 cm card strip as a longer unit.

Lesson 3: Telling the time to five minutes

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

Back to the grade 2 year plan

About 45 minutes.

Goal

Children read and set times to five minutes on a clock with hands, write them as digital times, and decide whether a time in a story is a.m. or p.m.

Materials

- A teaching clock with geared hands for the board, with raised numbers (glued string or thick glue dots) so it can be felt.
- A card clock per pair with an hour hand and a minute hand fixed by a paper fastener. An adult fixes the fasteners before the lesson and tapes over the sharp ends on the back.
- Digital time cards in large print: 3:00, 3:30, 4:25, 7:40, 10:05, 11:55.
- Little Hill day cards, each with a picture, a sentence and a time: "Hen opens the bakery at 7:15 in the morning", "The bus leaves for school at 8:40 in the morning", "Lunch is ready at the market at 12:10 in the afternoon", "Mayor Hen rings the town bell at 3:25 in the afternoon", "The lamps on the bridge are lit at 6:45 in the evening".
- A minutes card per pair for support: a ring of 5, 10, 15 ... 60 to sit around the card clock, one number beside each clock number.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Point to each number on the teaching clock and count in fives together: 1 is 5 minutes, 2 is 10 minutes, and so on round to 12, which is 60 minutes or "o'clock". "The minute hand goes all the way round in one hour. Each number is 5 more minutes."

✎ Main activity (30 min)

1. **O'clock and half past (8 min).** "The short hand is the hour hand. The long hand is the minute hand." Set 3:00: the minute hand on 12, the hour hand on 3. Move the minute hand slowly round to 6 and show the hour hand moving too. "Half an hour has gone. It is half past 3, or 3:30. The hour hand is halfway between 3 and 4." Show the digital cards 3:00 and 3:30.
2. **Five-minute jumps (12 min).** Set 4:25 on the teaching clock. "The minute hand points to 5. Count in fives: 5, 10, 15, 20, 25. The hour hand has gone past 4 but is not yet halfway to 5. It is 4:25." Pairs set each time on their card clock and match the digital card: 7:40 (minute hand on 8, hour hand more than halfway from 7 to 8), 10:05 (minute hand on 1, hour hand just past 10), 11:55 (minute hand on 11, hour hand

almost at 12 but still 11 o'clock and some minutes). Partners take turns: one sets a time, the other reads it and writes it.

3. **a.m. and p.m. (10 min).** "There are two of every time each day: one in the morning and one in the afternoon or evening. Times from midnight until midday are a.m. Times from midday until midnight are p.m." Hand out the Little Hill day cards. Pairs set each time on the card clock, write it with a.m. or p.m., then the class puts the cards in order through the day:
    - 7:15 a.m. Hen opens the bakery;
    - 8:40 a.m. the bus leaves for school;
    - 12:10 p.m. lunch is ready at the market;
    - 3:25 p.m. Mayor Hen rings the town bell;
    - 6:45 p.m. the lamps on the bridge are lit.

✓ Discussion questions (with answers)

- How do you know which hand is which? The hour hand is shorter; the minute hand is longer.
- At 11:55, the hour hand is almost on 12. Why do we say 11:55 and not 12:55? The hour hand has not reached 12 yet, so it is still 11 and some minutes.
- Is lunch at 12:10 a.m. or p.m.? p.m., because it is just after midday.

✓ Closing check (10 min, with answers)

Set 2:35 on the teaching clock. "What time is it? Write it." (2:35.) "Show me 6:10 on your clock." (Minute hand on 2, hour hand just past 6.) "Goat reads a story before bed at 7:30. Is that a.m. or p.m.?" (p.m.) Note who reads the hour from the number the hour hand has just passed, and who reads the nearest number.

Vocabulary

clock, hour hand, minute hand, o'clock, half past, minutes, a.m., p.m., morning, afternoon, evening, midday, midnight

Differentiation

- **Support:** set only o'clock, half past, and times where the minute hand points to 1, 2 or 3 (5, 10 or 15 minutes past). Put the minutes card around the card clock.
- **Stretch:** "The bus leaves at 8:40. Hen arrives 10 minutes later. What time does Hen arrive?" (8:50.) Talk about "quarter past" and "quarter to" as other ways to say 15 and 45 minutes.
- Children who are blind or have low vision feel the raised numbers and the hands of the teaching clock or their card clock.

⚠ Safety

An adult fixes the paper fasteners and tapes over the sharp ends before the lesson. Never ask children about their own wake, meal or bed times; the times belong to the Little Hill characters.

Teacher notes and misconceptions

- The most common mistake is reading the hour from the nearest number when the minute hand is past 30, so 9:50 is read as 10:50. Ask "Has the hour hand reached 10 yet?"
- Some children mix up the hands. Giving the minute hand a different colour and a different feel (a strip of tape along it) and saying "long hand, minutes" helps.
- Times exactly at 12:00 can confuse even adults (12:00 midday is often written 12:00 p.m.), so the lesson avoids them.
- Many children see more digital clocks than clocks with hands. Keep a clock with hands in the classroom and read it together each day.

Lesson 4: Counting coins at the Little Hill market

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

Back to the grade 2 year plan

About 45 minutes.

Goal

Children name pennies, nickels, dimes and quarters and their values, find the value of a set of coins by counting on from the biggest, write amounts with the ¢ sign, and solve one-step story problems with made-up prices.

Materials

- Card coins per pair, too large to swallow, printed on both sides with the value raised (glued string or thick glue) so it can be felt: 4 quarters, 6 dimes, 6 nickels and 10 pennies, plus one card dollar bill. Draw the coins in the same order of size as real coins (the dime smallest, then the penny, the nickel and the quarter).
- Little Hill market price cards with made-up prices (an example, not real prices): pear 35¢, ribbon 20¢, pencil 15¢, packet of seeds 50¢, toy kite 75¢.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

Count together in fives to 50 and in tens to 100, as in term 2. "Today we will use counting in fives and tens to count money."

✎ Main activity (30 min)

1. **Meeting the coins (8 min).** Show each card coin and say its value: a penny is 1 cent (1¢), a nickel is 5¢, a dime is 10¢ and a quarter is 25¢. A dollar is 100¢, written $1. Pairs sort their coins into four piles. "Which coin is the smallest?" (The dime.) "Which coin is worth the most?" (The quarter.) "Is the smallest coin worth the least?" (No: a dime is worth more than a penny or a nickel.)
2. **Counting a handful (12 min).** Model counting on from the biggest value: quarter, dime, dime, penny: "25, 35, 45, 46. That is 46¢." Pairs take turns to give their partner a set of coins to count, then try these together:
    - 2 dimes and 3 pennies (23¢);
    - 3 dimes, 2 nickels and 4 pennies (dimes 10, 20, 30; nickels 35, 40; pennies 41, 42, 43, 44: 44¢);
    - a quarter, a dime and a nickel (40¢);
    - 4 quarters (25, 50, 75, 100: 100¢, which is $1).

3. **The Little Hill market (10 min).** Put out the price cards. Pairs pay for each thing with card coins in one way, then find a second way (the pear, 35¢: a quarter and a dime, or 3 dimes and a nickel). Then story problems, solved with coins and written as a number sentence:
    - "Duck has 2 quarters and buys a pear. How much money is left?" (50¢ - 35¢ = 15¢.)
    - "Goat buys a packet of seeds and a pencil. How much is that?" (50¢ + 15¢ = 65¢.)
    - "Mouse has 60¢. The toy kite costs 75¢. How much more does Mouse need?" (75¢ - 60¢ = 15¢.)

✓ Discussion questions (with answers)

- Why do we start counting with the coin worth the most? It is quicker: big jumps first, then small ones.
- How many dimes make a dollar? 10, because 10 tens make 100.
- Can two children have different coins but the same amount of money? Yes: a quarter and a nickel is 30¢, and so are 3 dimes.

✓ Closing check (10 min, with answers)

Show 2 quarters, a dime and a penny. "How much money is this?" (61¢.) "Show me 30¢ in two different ways." (For example 3 dimes; a quarter and a nickel; 6 nickels.) "Hen has 50¢ and buys a packet of seeds. How much is left?" (0¢.) Note who counts on from the biggest coin and who counts every coin as 1.

Vocabulary

penny, nickel, dime, quarter, dollar, cent, ¢, $, value, worth, price, cost, left, more

Differentiation

- **Support:** use only dimes and pennies first, which works like tens and ones (3 dimes and 4 pennies is 34¢), then add nickels.
- **Stretch:** "Find all the ways to pay 25¢ with dimes, nickels and pennies if you use no more than 5 coins." (2 dimes and 1 nickel; 1 dime and 3 nickels; 5 nickels.)
- Children who are blind or have low vision feel the raised values on the card coins. Sorting by size alone does not work because the dime is the smallest coin.

⚠ Safety

Use card coins, not real coins: real coins are a choking risk and are handled by many people. Never ask children about family money, pocket money or what things cost at home; the prices belong to the Little Hill market.

Teacher notes and misconceptions

- Many children think a bigger coin is worth more, so the nickel seems worth more than the dime. Keep asking "What is it worth?" rather than "Which is bigger?"
- Some children count every coin as one. Ask "How many cents is this coin?" before counting.
- These are United States coins. Schools in other countries should use their own coins and change the values and prices.
- Writing amounts with a decimal point ($0.42) is not taught here; amounts under a dollar are written with ¢.

Lesson 5: Sides, corners and a shape bar graph

Unit overview - Previous: Lesson 4

Back to the grade 2 year plan

About 45 minutes.

Goal

Children name triangles, quadrilaterals, pentagons and hexagons by counting sides and corners, say how many faces a cube has, put shapes together to make new shapes, and make and read a bar graph with four categories.

Materials

- Card shapes per pair in different sizes and turned different ways: triangles, quadrilaterals (including squares, rectangles and some with no equal sides), pentagons and hexagons.
- Pattern blocks too large to swallow, per pair: 6 triangles, 2 trapezoids, 2 rhombuses (diamonds) and 1 hexagon.
- A cube per pair, such as a large wooden or foam block.
- A shape bag per pair holding exactly 19 card shapes: 5 triangles, 7 quadrilaterals, 3 pentagons and 4 hexagons.
- Squared paper (2 cm squares) and dot paper per child; card squares and glue for raised bar graphs. Small stickers for marking corners.
- A bar graph for the board, also made with raised card squares: boats on the Little Hill pond, with sailing boats 3, rowing boats 5 and canoes 2.
- Whiteboards and pens, or paper and pencils.

Steps

✎ Opening (5 min)

"In grade 1 we found out what makes a triangle a triangle." Hold up a long, thin triangle and a square. "How did we know?" (Count the straight sides and the corners: 3 for a triangle.) "Today we count sides and corners to name more shapes."

✎ Main activity (30 min)

1. **Count and name (10 min).** Pairs take turns to pick a card shape, run a finger along each side while counting, then touch each corner. Name each group as it is found: 3 sides and 3 corners is a triangle; 4 sides and 4 corners is a quadrilateral (squares and rectangles are quadrilaterals too); 5 is a pentagon; 6 is a hexagon. "Does turning the shape or making it bigger change its name?" (No.) Then hold up the cube: pairs count its flat faces (6, all squares the same size) and its corners (8). Each child draws a shape with 5 corners on dot paper and a partner checks it is a pentagon.

2. **Making new shapes (8 min).** With pattern blocks: "Put 2 triangles together to make a shape with 4 sides." (A rhombus, which is a quadrilateral.) "Can you cover a trapezoid with triangles?" (Yes, 3.) "Can you cover the hexagon with triangles?" (Yes, 6.) "With trapezoids?" (Yes, 2.) Pairs lay the pieces on top of the hexagon to check, then count the sides of each new shape they make.
3. **A shape bar graph (12 min).** Each pair tips out its shape bag and sorts the shapes into four rows by name, one card for each shape, lined up at the left like a picture graph. Then they make a bar graph on squared paper: one square for each shape, filled in or covered with a card square, with the four names written along the bottom. Ask:
    - "How many shapes altogether?" (5 + 7 + 3 + 4 = 19.)
    - "Which shape is there least of?" (Pentagons.)
    - "How many more quadrilaterals than pentagons?" (7 - 3 = 4.)
    - "How many triangles and hexagons together?" (5 + 4 = 9.)

✓ Discussion questions (with answers)

- Is a square a quadrilateral? Yes: it has 4 sides and 4 corners.
- A shape has 6 sides but they are not all the same length. Is it a hexagon? Yes: it has 6 sides and 6 corners.
- Why do the bars start at the same line? So we can compare them fairly, just like lining up strips at one end before measuring.

✓ Closing check (10 min, with answers)

Hold up a pentagon with sides of different lengths. "What is this shape?" (A pentagon: 5 sides and 5 corners.) "Draw a shape with 4 corners. What is it called?" (A quadrilateral.) Show the boats bar graph. "How many boats altogether?" (10.) "How many more rowing boats than canoes?" (3.) Note who counts sides carefully and who names shapes by how they look.

Vocabulary

side, corner, triangle, quadrilateral, pentagon, hexagon, cube, face, rhombus, trapezoid, bar graph, picture graph, altogether, how many more

Differentiation

- **Support:** sort triangles and quadrilaterals first, then add the other shapes. Put a small sticker on each corner as it is counted.
- **Stretch:** count the edges of the cube (12). "How many triangles would cover 2 hexagons?" (12.)
- Children who are blind or have low vision feel the sides and corners of the card shapes and pattern blocks, and read the bar graph by feeling the raised card squares in each bar.

⚠ Safety

Use pattern blocks and cubes too large to swallow. Cubes stay on tables.

Teacher notes and misconceptions

- Many children think a shape turned on its corner is a different shape (a square "becomes a diamond"). Turn shapes and ask "Did the number of sides change?"
- Some children only call a shape a hexagon if all its sides are the same. Show irregular hexagons often.
- Counting corners on a shape with many sides is easy to get wrong; touching each corner, or putting a small sticker on it, helps.
- Line plots, splitting rectangles into rows of squares, and halves, thirds and fourths are not taught in this unit (see Known gaps in the unit overview).