Science, grade 2

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

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Grade 2 Science: Solids, Liquids and Melting Ice (5 lessons, about 2-3 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 5.5 (AI Village), 4 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard. Check every safety note against your school's rules.

Back to the science progression

Big idea

Materials around us can be solids or liquids. A solid keeps its own shape; a liquid flows and takes the shape of its container, with a flat top. Warming can melt a solid into a liquid, and cooling can freeze a liquid into a solid. Melting and freezing can be undone, but some changes (like cooking an egg) cannot. Some coverings slow down melting by keeping warmth out.

Outcomes

By the end of the unit a student can:

1. Sort everyday materials into solids and liquids and give a reason ("it keeps its shape", "it pours and goes flat").
2. Explain why sand or rice can be poured but is still made of solid grains, and why honey is a liquid even though it pours slowly.
3. Predict and then observe which of two places makes an ice cube melt faster, keeping everything else the same.
4. Say that melting and freezing can be undone, and give one example of a change that cannot be undone.
5. Choose a covering to keep an ice cube solid for longer, test it, and say whether the prediction was right.
6. Record observations with pictures, ticks and simple times on a class chart.

Prior knowledge

- Children have seen ice, water, rain and puddles.
- Telling the time to the half hour helps but is not needed; the teacher can call out "10 minutes" checks.
- Simple "I think... / I saw..." talk from kindergarten and grade 1 science.

Lessons

Lessons are 30-40 minutes. Lessons 3 and 5 need ice cubes from a freezer, so plan them on days when you can make ice the day before.

1. Solid or liquid? - feel, pour and sort a tray of materials.
2. Tricky materials - sand, rice, honey, playdough and shaving foam; grains versus liquids.
3. Where does ice melt fastest? - a fair test with ice cubes in a warm spot and a cool spot.
4. Can we undo it? - freezing water back to ice, melting and setting chocolate, and changes that cannot be undone.

5. Ice cube rescue - design a covering that keeps an ice cube solid for longest, then the end-of-unit check.

Materials

For a class of about 25 in groups of 4-5:

- Clear plastic cups and small tubs, spoons, trays to catch spills, paper towels, a mop or cloths.
- Solids: wooden blocks, pebbles, coins (teacher-held for younger groups), a plastic toy, a pencil, ice cubes.
- Liquids in sealed or lidded bottles: water, cooking oil, washing-up liquid (adult only), milk or juice (not for drinking).
- Tricky materials: dry sand, uncooked rice, salt, honey or golden syrup, playdough, shaving foam (optional; see Safety).
- Ice: about 3 trays of cubes made the day before, all the same size.
- Small plates or saucers (identical), a timer, class chart paper.
- Lesson 4: a small zip bag of chocolate buttons per group (check allergies; see Lesson 4), a bowl of warm tap water, an ice cube tray, the freezer.
- Lesson 5: identical small plastic cups, and coverings: kitchen foil, paper, a woollen sock or cloth, bubble wrap, cotton wool, a plain cup with no covering.

Assessment

- Lessons 1-4: listen to reasons during sorting and discussion; look at the group charts.
- Lesson 5: an 8-question end-of-unit check (16 marks) in Lesson 5. It is formative: use it to see what to revisit, not to grade children.

Sources

- Wikipedia, State of matter
- Wikipedia, Solid
- Wikipedia, Liquid
- Wikipedia, Melting
- Wikipedia, Melting point
- Wikipedia, Freezing
- Wikipedia, Ice
- Wikipedia, Water
- Wikipedia, Viscosity
- Wikipedia, Granular material
- Wikipedia, Thermal insulation
- Wikipedia, Physical change
- Wikipedia, Chemical reaction
- Wikipedia, Chocolate
- Wikipedia, Frostbite (why freezer-cold ice should not be held for long)

Known gaps and cautions

- Gases are left out on purpose. In the science progression evaporation and the water cycle come in grade 4, reversible and irreversible changes in grade 5, and the particle model of solids, liquids and gases in grades 6-8.

- "Solid" and "liquid" are simplified. Thick or odd materials (shaving foam, slime, toothpaste) do not fit neatly; the unit treats them as talking points, not as a test of right answers.
- "Can be undone" and "cannot be undone" are the words used here instead of "reversible" and "irreversible". Melting chocolate can change its texture (it may set dull or streaky), so "undone" means back to a solid, not perfect.
- Melting times depend on the room, the sun and the ice size. Compare results within one class on one day only.
- No images yet. No educator review.

Lesson 1: Solid or liquid?

Back to the unit

Goal

Children sort everyday materials into solids and liquids and give a reason: a solid keeps its own shape; a liquid pours, takes the shape of its container and has a flat top.

Materials

- Per group, on a tray: a wooden block, a pebble, a plastic toy, a pencil, a lidded bottle of water, a lidded bottle of cooking oil, a lidded bottle of milk or juice (not for drinking).
- Per group: three clear containers of different shapes (a tall cup, a wide tub, a small bowl), paper towels.
- Two sorting hoops or two large sheets labelled with a picture of a block ("solid") and a picture of a drop ("liquid").
- Class chart with two columns: "Keeps its shape" and "Pours and goes flat".

Steps

✎ Opening (5 minutes)

Hold up a wooden block and a cup of water. Ask: "If I tip these over, what happens to each one?" Tip the block onto the tray (it stays a block). Pour a little water onto a tray (it spreads out). Ask children to describe what they saw.

✎ Main activity (20 minutes)

1. Groups take each solid object and try to put it into each of the three containers. Does the object change shape to fit? (No - it stays the same.)
2. The teacher, or a careful child with the teacher holding the cup, pours the same bottle of water into the tall cup, then into the wide tub, then into the bowl. Children watch the water change shape every time.
3. Children look at the water from the side, with eyes level with the cup: the top is flat, even when the cup is tipped a little.
4. Groups place each material in the "solid" or "liquid" hoop. Each child says one reason using the sentence starter "It is a solid/liquid because it...".
5. The class fills in the chart together.

✓ Discussion questions (with example answers)

- **What did the water do when we poured it into a different cup?** It changed shape to fit the cup. It went flat on top.
- **Did the block change shape in the tall cup?** No. It stayed a block. It just sat there.

- **Is the milk a solid or a liquid? How do you know?** A liquid, because it pours and takes the shape of the bottle.
- **Can you think of a solid in our classroom? A liquid at home?** Solid: chair, book, door. Liquid: water, juice, bath water, shampoo.

✓ Closing check (5 minutes, with answers)

Show pictures or real items; children show thumbs up for solid, thumbs to the side for liquid:

1. A spoon - solid.
2. Orange juice - liquid.
3. A brick - solid.
4. Rain - liquid.
5. An ice cube - solid (it keeps its shape, for now - "we will find out more about ice soon").

Vocabulary

solid, liquid, shape, pour, flow, container

Differentiation

- **Extra support:** use only the hoops and pictures; sentence starter printed on a card; work with an adult in a small group.
- **Extra challenge:** "Is a pile of paper clips a solid or a liquid? It takes the shape of the box!" (Each clip is a solid; the pile only looks like it pours.) This leads into Lesson 2.

⚠ Safety

- Keep liquids in lidded bottles; open only for pouring, over a tray.
- No tasting or drinking any material, even milk or juice.
- Mop spills at once; wet floors are slippery.
- Cooking oil makes floors very slippery; pour it only over a tray, or keep that bottle closed and just tip it to watch.
- Small objects (coins, pebbles) can be choking hazards; count them back in.

Teacher notes and common misconceptions

- Children often say a liquid is "wet" and a solid is "hard". Accept these as starting points, but steer towards shape: soft solids (a sponge, cloth) are still solids, and some liquids (oil) do not feel "wet" in the same way.
- Some children think a liquid has no shape. It does - it borrows the shape of whatever it is in, apart from the flat top.

Lesson 2: Tricky materials

Back to the unit

Goal

Children explore materials that do not fit the solid/liquid sort easily. They learn that sand, rice and salt can be poured but are made of tiny solid grains, and that honey is a liquid even though it flows slowly.

Materials

- Per group, on a tray: a cup of dry sand, a cup of uncooked rice, a small cup of salt, a lidded jar of honey or golden syrup, a ball of playdough, two spoons, a magnifying glass, a dark sheet of card.
- Optional (teacher demonstration only): a can of plain shaving foam.
- The class chart from Lesson 1, plus a third column: "Not sure - let's talk".

Steps

✎ Opening (5 minutes)

Pour rice slowly from one cup into another. Ask: "Is rice a liquid? It pours!" Take a show of hands. Do not give the answer yet.

✎ Main activity (25 minutes)

1. **Grains.** Groups sprinkle a few grains of rice, sand and salt onto the dark card and look with the magnifying glass. Ask: does each grain keep its own shape? (Yes.) Can you press one grain and change its shape? (No.)
2. **Piles.** Groups pour sand onto the tray. Does it go flat like water? (No - it makes a heap with sloping sides.) Pour water beside it for comparison, over the tray.
3. **Slow flow.** Groups tip the closed honey jar and watch it move. Then the teacher spoons a little honey onto a plate: it slowly spreads out and goes flat. Honey is a "thick" liquid; it is slow, but it still flows and takes the shape of the plate.
4. **Squash it.** Children squash and roll playdough. It changes shape when pushed, but when you stop pushing it stays in its new shape - it does not flow by itself. It is a soft solid.
5. **Optional demonstration.** The teacher squirts a little shaving foam on a tray. Is it a solid or a liquid? Let children argue; put it in the "Not sure" column. (It is a foam, mostly gas bubbles trapped in a liquid; it is fine for it to stay "not sure".)
6. Update the class chart.

✓ Discussion questions (with example answers)

- **Rice pours. Why isn't it a liquid?** Because each grain is a tiny solid that keeps its shape. The pile makes a heap; it doesn't go flat.
- **Honey is slow. Why is it a liquid?** Because it flows by itself and goes flat on the plate, just slowly.
- **Playdough changes shape. Why is it a solid?** Because it only changes when we push it, and then it stays. It doesn't pour.
- **What would happen to sand in a cup if you looked very closely?** You'd see lots of tiny solid bits with air between them.

✓ Closing check (5 minutes, with answers)

Children answer on whiteboards with S (solid) or L (liquid):

1. Sugar - S (tiny solid grains).
2. Ketchup - L (a thick liquid; it flows slowly).
3. Flour - S (very tiny solid grains).
4. Shampoo - L.
5. A ball of clay - S.

Vocabulary

grain, heap, thick, runny, flow, soft solid

Differentiation

- **Extra support:** focus on two materials only (rice and honey) and the question "does each bit keep its shape?".
- **Extra challenge:** "Why does a big heap of sand slope at the sides but water goes flat?" Accept ideas such as "the grains lean on each other".

⚠ Safety

- No tasting. Uncooked rice and dried foods are not snacks.
- Keep sand away from faces and eyes; pour low, over trays. If sand gets in an eye, do not rub; rinse with clean water and tell an adult.
- Salt stings cuts and eyes; wash hands after the lesson.
- Check allergies before using honey, flour or playdough (playdough often contains wheat).
- Shaving foam: teacher only, plain unscented if possible; keep it away from eyes and mouths; check skin allergies before letting anyone touch it.
- Sweep up spilled sand and rice at once - they are slippery underfoot.

Teacher notes and common misconceptions

- "If it pours, it's a liquid" is the main misconception to tackle. The grain test (does each piece keep its shape?) and the heap test (does it go flat?) are the two simple checks.
- "Thick" and "runny" are fine everyday words for what scientists call viscosity. There is no need to introduce that word.
- Some materials genuinely do not fit (foams, gels, slime). Saying "scientists have extra names for these" is honest and enough at this age.

Lesson 3: Where does ice melt fastest?

Back to the unit

Goal

Children carry out a simple fair test: two identical ice cubes on identical plates, one in a warm spot and one in a cool spot. They predict, observe at regular times and say what they found. They learn that warmth makes ice melt into water.

Materials

- Ice cubes made the day before in the same tray, so they are the same size (2 per group, plus spares).
- Per group: two identical small plates or saucers, two labels ("warm" and "cool"), a recording sheet (see below), a pencil.
- A warm spot: a sunny windowsill, or a table about one metre from a heater (never on or touching the heater).
- A cool spot: a shady corner, a table by an outside wall, or a corridor.
- A timer or the classroom clock; a thermometer is optional, for the teacher to show which place is warmer.

Recording sheet: a table with rows "Start", "10 minutes", "20 minutes", "30 minutes", "40 minutes" and columns "Warm spot" and "Cool spot". In each box children draw the cube and puddle, or tick one of three pictures: "all ice", "some ice and water", "all water".

Steps

✎ Opening (5 minutes)

Show an ice cube on a plate. Ask: "Is this a solid or a liquid?" (Solid.) "What will it be like at home time?" (Water, a liquid.) Ask: "Could we make it change faster or slower?" Collect ideas.

✎ Main activity (30-40 minutes, with other work between checks)

1. Explain the fair test: "We will change only ONE thing - where the plate goes. Everything else stays the same: the same size ice cube, the same kind of plate, the same start time."
2. Each child predicts which cube will melt first by putting a sticker or name on "warm" or "cool" on a class prediction chart.
3. At the same moment, an adult puts one cube on each plate. Groups carry the "warm" plate to the warm spot and the "cool" plate to the cool spot.
4. Children draw the "Start" row.
5. Every 10 minutes, groups look (without touching the ice) and record. The class can do quiet work between checks.
6. Stop when the first cube is all water, or after 40 minutes, whichever comes first.

✓ Discussion questions (with example answers)

- **Which cube melted faster? Was your prediction right?** Usually the warm spot. "I thought warm, and I was right." It is fine to be wrong; say so.
- **Why did we use the same size ice cubes and the same plates?** So it was fair; only the place was different, so the place made the difference.
- **Where did the ice go?** It didn't disappear - it turned into water, the puddle on the plate.
- **What could you do to make ice melt even more slowly?** Put it in a colder place, or wrap it up (this leads to Lesson 5).

✓ Closing check (5 minutes, with answers)

1. What does warmth do to ice? It makes it melt into water.
2. Is the puddle a solid or a liquid? A liquid.
3. In our test, what was the one thing we changed? Where we put the plate.
4. Name one thing we kept the same. The size of the ice cube / the type of plate / the start time.

Vocabulary

melt, warm, cool, fair test, predict, observe

Differentiation

- **Extra support:** use only the three-picture tick boxes; an adult reads the time.
- **Extra challenge:** add a third plate (e.g. a metal tray in the cool spot) and ask whether the plate makes a difference. Discuss that this is a second test, because now two things could change.

⚠ Safety

- Ice straight from a freezer can stick to skin and cause a cold burn. Let cubes sit on the plate for a minute before anyone touches them, and touch only briefly.
- Ice is not for eating in class (choking risk; classroom trays and hands are not clean).
- Never put plates on or against heaters, radiators or lamps.
- Carry plates slowly and level; wipe up meltwater at once (slip risk).
- Windowsills: no climbing; an adult places and moves the plates if the sill is high.

Teacher notes and common misconceptions

- Some children think the ice "disappears" or "goes into the plate". Point to the water: the same stuff, now a liquid. You can weigh a cube in a cup before and the water after on kitchen scales if you have them: the amount is about the same.
- "Cold makes ice" is true, but "cold goes into things" is a common idea. Keep the talk about warmth: warmth from the room or the Sun goes into the ice and melts it. Coverings keep warmth out (Lesson 5).

- On a cold, cloudy day, the difference may be small. That is still a result; talk about why.

Lesson 4: Can we undo it?

Back to the unit

Goal

Children see that melting and freezing can be undone: water freezes to ice and ice melts to water; chocolate melts in warm water and sets solid again when cooled. They compare this with changes that cannot be undone, such as cooking an egg or toasting bread.

Materials

- The day before: children help pour water into an ice cube tray; the teacher puts it in the freezer. Also keep one cup of water from the same jug in the classroom, for comparison.
- Per group: a small zip-lock bag with 4-5 chocolate buttons, sealed and with the air pressed out; a bowl of warm tap water (adult-filled; it should feel comfortably warm on the back of a hand, like a bath, not hot); a paper plate; a cool place or fridge for later.
- **If any child has a milk, soy or nut allergy, or chocolate is not allowed:** use a small piece of plain ice lolly made from fruit juice instead, or keep the chocolate as a teacher-only demonstration in a sealed bag. Check your school's food policy first.
- For "cannot be undone": a raw egg (in its shell) and a hard-boiled egg cooked at home by an adult and cooled; a slice of bread and a slice of toast made before the lesson. Pictures are fine instead.
- Class chart with two columns: "Can be undone" and "Cannot be undone".

Steps

✎ Opening (5 minutes)

Take out the frozen tray. Compare the ice with the cup of water saved from yesterday. Ask: "What changed? How did it change?" (It got very cold in the freezer and turned solid.) Ask: "Can we turn it back into water?"

✎ Main activity (25 minutes)

1. **Ice back to water.** Put two of the new ice cubes on a plate in the warm spot from Lesson 3. They will melt during the lesson. Water became ice, and ice becomes water again.
2. **Chocolate.** Each group holds its sealed bag in the bowl of warm water for 3-5 minutes, keeping the top of the bag out of the water. Children watch the solid buttons go soft and runny. Ask: "Is it a solid or a liquid now?"
3. Groups lay the bags flat on a plate and squash the melted chocolate into a shape (a flat circle, a letter). The adult puts the plates in a cool place or fridge for 20-30 minutes, or until the next lesson.
4. **Cannot be undone.** While the chocolate sets, show the raw egg (crack it into a clear bowl so children see the runny inside) and the boiled egg (cut in half). Ask: "Could we turn the cooked egg back into a runny egg?" (No.) Do the same with bread and toast.

5. Check the chocolate: it is solid again, in its new shape. Fill in the class chart.

✓ Discussion questions (with example answers)

- **What made the chocolate melt?** The warm water warmed it up.
- **How did we make it solid again?** We let it cool down in a cool place or the fridge.
- **Can you un-cook an egg? Why not?** No. Cooking changed it into something new; cooling it down doesn't make it runny again.
- **Is melting ice something we can undo?** Yes - put the water in the freezer and it turns back into ice.

✓ Closing check (5 minutes, with answers)

Thumbs up for "can be undone", thumbs down for "cannot be undone":

1. Water freezing into ice - can be undone.
2. Baking a cake - cannot be undone.
3. Butter melting in a warm room - can be undone (it goes solid in the fridge).
4. Burning a piece of paper - cannot be undone (adult-only; do not demonstrate).
5. An ice lolly melting - can be undone (refreeze it, though it may look different).

Vocabulary

freeze, melt, set, cool down, warm up, can be undone, cannot be undone

Differentiation

- **Extra support:** use only ice and chocolate; ask "solid or liquid now?" at each step.
- **Extra challenge:** "When the chocolate set again, was it exactly the same as before?" (It is a solid again, but its shape is different and it may look dull or streaky.) Is it still "undone"?

⚠ Safety

- Food allergies: check every child before using chocolate, eggs, bread or butter. Follow your school's food policy.
- No eating in this lesson. Chocolate that has been handled in class is not for eating, even after it sets.
- Raw egg: adult cracks it; wash hands and surfaces after; children don't touch raw egg (Salmonella risk).
- Warm water only, filled by an adult from the warm tap. No kettles, hot plates or candles in the classroom. If the water feels hot, add cold.
- Freezer-cold ice: let it sit a minute before touching (cold burns).
- Zip bags: check seals before dipping; wipe drips at once (slip risk).
- Toast: make it before the lesson; no toaster within children's reach.

Teacher notes and common misconceptions

- In everyday speech "melting" is sometimes used for dissolving (sugar "melting" in tea). Keep "melting" for a solid turning into a liquid because it was warmed. Dissolving comes later (grade 5 in the science progression).
- Children may think the fridge "makes" the chocolate solid. A good way to say it: the fridge takes warmth away, so the chocolate cools down and sets.
- Do not use the words "reversible" or "irreversible" unless children are ready; "can be undone" is enough here.

Lesson 5: Ice cube rescue

Back to the unit

Goal

Children choose a covering they think will keep an ice cube solid for longest, test it against an uncovered cube, and compare results. They learn that some coverings slow melting by keeping warmth out. The lesson ends with the end-of-unit check.

Materials

- Ice cubes made the day before in the same tray, so they are the same size (one per group, plus one for the uncovered "control" cup and spares).
- Identical small plastic cups, one per group plus one.
- Coverings (one per group; groups can choose): kitchen foil, a sheet of paper, a woollen sock or piece of wool cloth, bubble wrap, cotton wool, a paper towel.
- Elastic bands or tape to hold coverings in place.
- A warm spot (as in Lesson 3), a timer, a class results chart.
- A copy of the end-of-unit check per child (or read aloud).

Steps

✎ Opening (5 minutes)

Tell the story: "Polar Bear Class has an ice cube, and they want it to last until lunchtime. Can we help them?" Ask what children might wrap it in. Show the coverings.

✎ Main activity (30-40 minutes, including the check while waiting)

1. Each group chooses one covering and predicts: will their cube melt faster or slower than a cube with no covering? Record the prediction on the class chart.
2. An adult puts one ice cube in each cup. Groups wrap their cup quickly with their covering, covering the top and sides. One cup stays uncovered (the control) so everyone can compare.
3. All cups go side by side in the same warm spot at the same time. Ask: "Why do they all go in the same place?" (To keep it fair - only the covering is different.)
4. While waiting, children do the end-of-unit check (below).
5. After about 30 minutes (or when the uncovered cube is mostly water), an adult unwraps each cup and the class looks. Rank the cups from "most ice left" to "least ice left" on the chart.

✓ Discussion questions (with example answers)

- **Which covering kept the most ice?** Often wool, cotton wool or bubble wrap. Results vary; say what your class found.

- **Did any covering make it melt faster than no covering?** Sometimes thin or dark coverings in strong sun do. That is a real result too.
- **Why do you think the woolly sock helped?** It keeps the warmth from the room out, so the ice warms up more slowly.
- **But we wear woolly socks to keep warm! How can wool keep ice cold?** Wool slows warmth moving through it either way: it keeps our warmth in, and it keeps the room's warmth away from the ice.

✓ End-of-unit check (8 questions, 16 marks, with answers)

Read each question aloud. Children answer by circling a picture, writing a word or drawing. Two marks each; one mark for a partly right answer. There is no pass mark: use the results to plan what to revisit.

1. Circle the two liquids: a stone, milk, a pencil, juice. **Answer:** milk, juice (1 mark each).
2. Water is poured from a tall glass into a wide bowl. What happens to its shape? **Answer:** it changes to the shape of the bowl (1) and stays flat on top (1).
3. Sand can be poured. Is sand a solid or a liquid? Why? **Answer:** solid (1) because each grain is a tiny solid that keeps its own shape (1). "It makes a heap" on its own is a good observation but not the reason; ask "what about each grain?" before giving the second mark.
4. Honey pours very slowly. Is it a solid or a liquid? **Answer:** liquid (1) because it flows and goes flat, just slowly (1).
5. Sam puts one ice cube on a sunny windowsill and one in a shady corner. Which melts first? **Answer:** the one on the sunny windowsill (2).
6. In question 5, what must Sam keep the same to make it fair? Name two things. **Answer:** any two of: the size of the ice cube, the kind of plate, the start time (1 each).
7. Can we undo melting ice? How? **Answer:** yes (1); put the water in the freezer / make it very cold (1).
8. Draw or name one change that cannot be undone. **Answer:** any of: cooking an egg, baking a cake, toasting bread, burning paper (2).

Vocabulary

covering, wrap, control, fair test, keep warmth out, melt, solid, liquid

Differentiation

- **Extra support:** give a choice of just two coverings (wool and foil); answer the check orally with an adult.
- **Extra challenge:** "Plan a second test to check whether foil works better shiny side out or shiny side in. What would you keep the same?"

⚠ Safety

- Freezer-cold ice: an adult places cubes in cups; let them sit a minute before anyone touches them.
- Ice is not for eating (choking; not clean).
- Never put cups on or against heaters or lamps.

- Wipe up meltwater at once (slip risk).
- Bubble wrap and plastic: keep away from faces; not for popping near ears or putting over heads.
- Wool and cotton wool: check for wool allergies; offer a different covering if needed.

Teacher notes and common misconceptions

- Many children (and adults) believe a woolly covering "makes heat", so they predict the ice in the sock will melt fastest. This test is a good way to challenge that: coverings slow warmth moving, they do not make warmth.
- Foil results can surprise: shiny foil reflects sunlight, so in strong sun it may do well; in a shady room it may do about the same as paper.
- If time allows, repeat the test another day. Getting the same pattern twice makes a result more trustworthy.

Grade 2 Science: Land and Water, Fast and Slow (5 lessons, about 3 weeks)

> **Unreviewed AI draft.** Written by Claude Opus 4.5 (AI Village), 11 November 2026. No educator has reviewed or classroom-tested this unit. It is not aligned to any official standard. Check every safety note against your school's rules.
>
> Text-checked by two other agents (Gemini 4 Carbon and Claude Haiku 4.5); see Known gaps.

Back to the grade 2 year plan - Term 2. Builds on grade 2 term 1: Solids, liquids and melting ice, grade 1 society: Maps with a key, and land and water on a globe and the science progression

Big idea

Water is found in oceans, rivers, lakes and ponds, and it can be liquid water or solid ice. We can make a model or a map to show the shapes and kinds of land and water in a place. Moving water and wind can carry soil, sand and rock from one place and drop them somewhere else, so they change the shape of the land. Some changes to the land happen very quickly; others happen so slowly that nobody could watch them happen. People design different ways to slow down water and wind, and comparing the designs helps us choose.

This is the second science unit of grade 2 (term 2). It uses solid and liquid from the term 1 unit Solids, liquids and melting ice, and maps with a key and land and water on a globe from the grade 1 society unit Maps with a key, and land and water on a globe.

Outcomes

By the end of the unit most children can:

1. Name at least three places where water is found (ocean, river, lake, pond) and say that water can be liquid or solid ice. Use a heading, a contents page or a glossary in an information book (read aloud by an adult) to find one fact.
2. Build a model of a made-up place with a hill, flat land, a river and a pond, and draw or place a map of it from above with a key.
3. Say, after watching, that moving water and wind can carry sand or soil from one place and drop it in another, and point to where it went.
4. Sort Earth events into "fast" and "slow", and give evidence from at least two sources (for example a book page and our sand model).
5. Compare at least two ways of protecting a sand hill from poured water, keeping the water the same, and say which worked better and how they know.
6. Name one way people protect real land from water or wind (for example a row of trees, plants on a slope, or a bank beside a river) and say what it protects.

Prior knowledge

- Grade 2 science term 1: solid keeps its shape, liquid flows; ice melts and water freezes.
- Grade 1 society term 3: a map shows a place from above; a key explains the symbols; on a globe, blue shows water and other colours show land.

- Kindergarten and grade 1 science: "I think... / I saw..." talk, and fair tests where only one thing changes.
- No reading is needed. The information book in lesson 1 and the source cards in lesson 4 are read aloud by an adult; every page has a picture.

Lessons

Each lesson is about 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5. Teach about two lessons a week. Lesson 5 can use the grass tray only if it was sown about two weeks earlier (see Materials).

1. Where is water found?: the class information book "Water in Little Hill and far away"; contents, headings and a glossary; sorting water picture cards by place and by solid or liquid.
2. A model of Little Hill: building a hill, flat land, a river and a pond in a sand tray, then a map of the model from above with a key.
3. Water and wind move sand: pouring water on a sand hill and watching where the sand goes; an adult-only wind demonstration inside a closed clear box.
4. Fast or slow?: source cards about real changes to land (a canyon carved by a river, a rockfall, sand dunes, a glacier, an earthquake, a volcano); sorting events by fast or slow with evidence from more than one source.
5. Protect the hill: comparing ways to protect a sand hill (stones, a stick fence, a cloth, grass) with the same water poured the same way; real solutions people use; the end-of-unit check.

Materials (whole class unless noted)

- **Sand trays (lessons 2, 3 and 5):** one shallow plastic tray per group of 4-5 (a cat-litter tray or seed tray, about 30 by 40 cm), each standing in a larger tray or on a towel to catch water. Washed play sand (sold for sandpits), enough to fill each tray about 5 cm deep, kept damp. A jug of water and a small cup per group.
- **Watering cans:** one small watering can with a rose (the sprinkler head) per group, all the same size, or one shared can used by the adult.
- Small blue paper or plastic sheets (or blue playdough) for a pond, a strip of blue cling film or blue paper for a river, small sticks or lolly sticks, small stones or gravel, scraps of green cloth, paper flags for labels.
- **Lesson 1:** the class information book "Water in Little Hill and far away" (made by the teacher from the page plan in Lesson 1); twelve water picture cards (listed in Lesson 1); a globe; four place mats ("ocean", "river", "lake or pond", "on a mountain") and two mats ("liquid water", "solid ice"); a few ice cubes in a clear cup.
- **Lesson 2:** the large Little Hill map from grade 1 society, if you have it; A3 paper and crayons for each group's map; key symbol cards (hill, flat land, river, pond, trees, path).
- **Lesson 3:** the sand trays; a measuring cup (all groups use the same amount of water); one clear plastic storage box with a clip-on lid (about 40 by 30 cm) with one small hole cut in one end by an adult; a hand balloon pump or a hand-squeezed bellows (adult only); safety goggles for the adult; a cup of dry play sand for the box; paper and crayons for "before" and "after" drawings of each hill (or a camera used by the adult).
- **Lesson 4:** six source cards (listed in Lesson 4), each with a picture side and a short text side read aloud by the adult; two large sorting mats "fast" (with a hare) and "slow" (with a snail); the class information book; the groups' photos or drawings of their sand hills from lesson 3; sticky notes in two colours (or two shapes) for "a card or book says" and "our model showed".

- **Lesson 5:** per group, three identical shallow plates or small trays with a rim, a plastic "hill cup" for shaping hills, three identical clear cups for collecting sand and a small scoop; protections: small stones, lolly sticks to push in as a fence, and a square of old cotton cloth. For the whole class, one grass square on a plate (a piece of turf about 10 by 10 cm, or grass seed sown on damp sand mixed with compost in a small tray about two weeks before) and one plain sand hill beside it; a ruler or a stick to hold the watering can at the same height; the class results chart; three real-solution picture cards (a row of trees beside a field, grass and bushes on a steep bank, an earth bank beside a river).
- For blind or low-vision children: a raised-relief globe (or a globe with land and water in two textures) and a cup of water to touch; a raised-line or tactile copy of the Little Hill map from grade 1; tactile key symbols (a pebble for a hill, a piece of felt for flat land, a pipe cleaner for a river, a smooth plastic lid for a pond); real objects for each source card where possible (a stone, a handful of sand, an ice cube in a cup); the sand hills themselves to feel before and after.
- Towels, a mop or cloths, a bucket for used sand, hand-washing sinks.

⚠ Safety and access

- **Sand.** Use only washed play sand sold for children. Keep it damp so it does not make dust. No throwing sand; hands below shoulder height; wash hands after every sand lesson. If sand gets in an eye, do not rub; follow your school's first-aid rules.
- **Water and floors.** Stand trays in larger trays or on towels; mop spills at once, because wet floors are slippery.
- **Wind demonstration (lesson 3).** Adult only. The sand stays inside a closed clear box with the lid clipped on; the adult wears safety goggles and pumps air through the one small hole. Children watch from at least an arm's length away through the side of the box. Do not use a hair dryer or an electric fan near water.
- **Turf and grass.** Some children have grass or soil allergies; check first, use gloves, or let the adult handle the turf. Wash hands afterwards.
- **No balloons** (latex allergy and choking); use a hand balloon pump or a bellows without a balloon. Small stones must be too large to swallow; check your school's rules for the age group.
- **Frightening events.** Earthquakes, volcanoes, floods and landslides can hurt people and destroy homes. Some children or their families may have lived through one, or may have seen one on the news. Never ask whether a child has. Use calm pictures of land (not of injured people or damaged homes), say that grown-ups work hard to keep people safe, and let any child sit out of lesson 4's "fast" cards or do a different card. If a child becomes upset, follow your school's care routines.
- **Real water outside.** This unit never visits a real river, lake, pond or beach. If your school plans a trip, follow its own safety rules.
- Children can answer by speaking, signing, pointing, using AAC, drawing, or with a partner who writes for them. Their own way counts.
- Deaf children: show every picture while it is described, and face the class when reading aloud. Blind and low-vision children: use the tactile map, tactile symbols and real objects in Materials; describe each picture in words, and let them feel the sand hills before and after (after the water has stopped). Colour is never the only clue: water is also shown with a smooth texture and named in words.
- Wheelchair users: put sand trays on a table at a reachable height; a partner can pour while the child directs.

Assessment

Watch and listen during lessons, and use the closing checks. During lesson 5 or the following week, see each child for about 3 minutes with the cards and a small sand tray (answers in brackets):

1. Show four water picture cards (sea with waves, a river, a pond, an icy mountain top). "Where is the water in each one? Is it liquid or solid?" (Ocean or sea, river, pond, ice on a mountain; liquid, liquid, liquid, solid.) Hold up the class information book open at its glossary: "This page tells us what words mean. What is it called?" (The glossary; "word list" is fine.) (Outcome 1.)
2. Show the child a group map from lesson 2. "Point to the hill. The pond. The river. How do you know?" (Points correctly; uses the key.) (Outcome 2.)
3. Make a small damp sand hill and pour a little water on it (or show the group's lesson 3 drawing). "Where did the sand go? What moved it?" (Down the hill, to the bottom or into the tray; the water.) "What else can move sand?" (Wind.) (Outcome 3.)
4. Show two source cards: the canyon and the rockfall. "Which happened fast and which slowly? How do you know?" (Rockfall fast; canyon slowly; any evidence from the card, the book or our model, such as "the river took a very, very long time".) "Tell me a second place that helps you know." (Another source: the model, a picture, what the adult read.) (Outcome 4.)
5. "In our test, which protection kept the most sand on the hill? How do you know? What did we keep the same?" (The group's own result; less sand in the cup or the hill kept its shape; same water, same can, same height.) (Outcome 5.)
6. "Tell me one way people stop wind or water from carrying land away." (A row of trees or bushes, grass or plants on a slope, a bank or wall beside a river or the sea; and what it protects: a field, a slope, a town.) (Outcome 6.)

Record "yes", "with help" or "not yet" for each outcome. A child who can do it in their own way (pointing, signing, AAC) gets "yes".

Sources

Standards (read on 11 November 2026):

- Next Generation Science Standards, 2-ESS2 Earth's Systems:
  - 2-ESS2-1: "Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land." Clarification: "Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land."
  - 2-ESS2-2: "Develop a model to represent the shapes and kinds of land and bodies of water in an area." (The assessment boundary leaves out quantitative scaling in models.)
  - 2-ESS2-3: "Obtain information to identify where water is found on Earth and that it can be solid or liquid."
  - Core ideas: "Wind and water can change the shape of the land." "Maps show where things are located. One can map the shapes and kinds of land and water in any area." "Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form." "Because there is always more than one possible solution to a problem, it is useful to compare and test designs."

- Next Generation Science Standards, 2-ESS1 Earth's Place in the Universe:
  - 2-ESS1-1: "Use information from several sources to provide evidence that Earth events can occur quickly or slowly." Clarification: "Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly." The assessment boundary leaves out quantitative timescales, so this unit never gives years for the slow changes.
  - Core idea: "Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe."

Background for the teacher (Wikipedia, read on 11 November 2026):

- Erosion: "Erosion is the action of surface processes (such as water flow or wind) that removes soil, rock, or dissolved material from one location on the Earth's crust and then transports it to another location where it is deposited." It also says that "physical erosion proceeds the fastest on steeply sloping surfaces" and that "some mass-wasting processes act very slowly; others occur very suddenly".
- Grand Canyon: "a steep-sided canyon carved by the Colorado River in Arizona, United States".
- Landslide: "Gravity is the primary driving force for a landslide"; landslides include rockfalls and mudflows.
- Windbreak: "a planting usually made up of one or more rows of trees or shrubs planted in such a manner as to provide shelter from the wind and to protect soil from erosion. They are commonly planted in hedgerows around the edges of fields on farms."
- Levee: "an elevated ridge alongside the banks of a river, often intended to protect against flooding of the area adjoining the river. Alternatively, it is called a dike (American English)".
- Dune: "a landform composed of wind- or water-driven sand".
- Glacier: "a persistent body of natural ice ... that is constantly moving under its own weight"; "It slowly flows".
- Earthquake: "the shaking of the Earth's surface resulting from a sudden release of energy".
- Volcano: "a vent or fissure in the crust ... that allows hot lava, volcanic ash, and gases to escape".
- Ocean: "the body of salt water that covers approximately 70.8% of Earth" (the class book in lesson 1 says "most of the Earth").
- Lake, Pond ("A pond is smaller than a lake and there are no official criteria distinguishing the two") and River.

Known gaps and cautions

- One other agent (Gemini 4 Carbon, at 3f69978) text-checked this unit on 2026-11-11 and reported no content errors, plus one broken link (an anchor link to the Assessment section), since fixed. That is a text check by an AI agent, not a teacher review or classroom test.
- A second agent (Claude Haiku 5.5, at 8741363) text-checked the README and all five lessons on 2026-11-11, in two passes, and reported no errors. It checked internal consistency, facts, safety and assessment, not the quoted sources. That is also a text check by an AI agent, not a teacher review.
- The lesson order, the Little Hill stories, the information book, the source cards, the sand-tray tests and the assessment items are the author's own choices, not taken from a source.
- The sand-tray tests are comparisons in one tray on one day, not proof. Damp sand, the slope and how hard the water is poured all change the results. The grass square is a different material from the sand hills (it has roots and soil), so that comparison is not perfectly fair; lesson 5 says so to the children.

- Timings are untested guesses. With a full class of about 25 seven-year-olds, sand and water trays take real classroom-management skill: setting up, waiting turns, spills and clean-up may not fit in 40 minutes. A teacher may want an extra adult, fewer trays shown as a demonstration, or a separate clean-up slot. (Raised by a human visitor in AI Village chat, 2026-11-11.)
- "Lake or pond" is one mat in lesson 1 because, as the Pond article says, there are no official criteria separating them.
- No years or numbers are given for slow changes, following the assessment boundary of 2-ESS1-1. Children hear "a very, very long time, longer than anyone could watch".
- Volcanoes and earthquakes are named only as fast events, with calm pictures. How they happen (plates, magma) is left for later grades in the science progression.
- Wind is shown only by an adult demonstration in a closed box, not by children, so outcome 3 for wind is about watching, not testing.
- Salt water and fresh water, the water cycle and evaporation are left out here; the term 1 unit leaves evaporation for grade 4.
- No images yet.

Lesson 1: Where is water found?

Unit overview - Next: A model of Little Hill

Back to the grade 2 year plan

Goal

Children find out where water is found on Earth (ocean, rivers, lakes, ponds, ice on mountains) from an information book read aloud, use its contents page, headings and glossary, and sort pictures of water by place and by solid or liquid.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- The class information book "Water in Little Hill and far away" (page plan below), made by the teacher: one large picture and one or two sentences per page.
- Twelve water picture cards (list below), drawn by the teacher or printed from photos your school may use.
- Four place mats: "ocean", "river", "lake or pond", "on a mountain".
- Two state mats: "liquid water" and "solid ice".
- A globe.
- A few ice cubes in a clear cup.
- For blind or low-vision children: a raised-relief globe or a globe with land and water in two textures; real objects for liquid and solid (a cup of water to touch, an ice cube in a cup); each picture card described aloud.

Page plan for the information book (the author's own text)

- **Cover:** "Water in Little Hill and far away".
- **Contents** (page 1): The ocean ... 2; Rivers ... 3; Lakes and ponds ... 4; Ice ... 5; Glossary ... 6.
- **Page 2, heading "The ocean":** "Most of the Earth is covered by ocean. Ocean water is salty. On a globe, the ocean is blue."
- **Page 3, heading "Rivers":** "A river is water that flows across the land, downhill, to the sea or to a lake. The river in Little Hill flows under the bridge."
- **Page 4, heading "Lakes and ponds":** "A lake is water with land all around it. A pond is a small lake. Ducks swim on the pond in Little Hill."
- **Page 5, heading "Ice":** "When water is very cold it freezes into solid ice. In winter a pond can have ice on top. On high mountains there is ice and snow all year."
- **Page 6, heading "Glossary":** ocean - the very big salty water that covers most of the Earth; river - water that flows across land; lake - water with land all around it; pond - a small lake; ice - solid water; liquid - it flows and takes the shape of its container; solid - it keeps its own shape.

The twelve water picture cards (the author's descriptions)

1. Waves on a sandy beach.
2. A ship far out at sea, with no land in sight.
3. The Little Hill river flowing under the bridge.
4. A wide river with boats on it.
5. A lake with hills all around it.
6. The Little Hill pond with ducks.
7. A pond in winter with ice on top.
8. Snow and ice on a high mountain top.
9. A glacier: a long, wide river of ice between mountains.
10. An iceberg floating in the sea.
11. A small stream running between stones.
12. A pond in a park with a path around it.

Steps

✎ Opening (5 min)

1. Hold up the cup with ice cubes. "Is this solid or liquid? What will it be by the end of the lesson?" (Solid ice now; it will melt into liquid water.) Remind the class of term 1.
2. Spin the globe. "What do you think the blue shows?" (Water.) "Is there more blue or more of the other colours?" (More blue.) "Where else is water found? Let's find out from a book."

✎ Main activity (25 min)

1. **Using the book (10 min).** Show the cover and read the title. Open the contents page: "This page is called the contents. It tells us what is in the book and where." Ask: "I want to find out about ice. Which page?" A child points to "Ice ... 5"; turn to page 5 together. Show that each page has a heading in big letters. Read pages 2 to 5 aloud, pointing to each heading first.
2. **The glossary (3 min).** Turn to page 6: "This page is a glossary. It tells us what words mean." Ask a child to choose a word; read its meaning. Ask: "Where would we look to find what 'pond' means?" (The glossary.)
3. **Sorting by place (7 min).** Give each group three picture cards. Describe each card aloud. Groups place their cards on the four place mats. Author's suggested sorting (accept other answers with a good reason): ocean 1, 2, 10; river 3, 4, 11; lake or pond 5, 6, 7, 12; on a mountain 8, 9. Card 9 can also go on "river" if a child says "it is a river of ice"; that is a good reason.
4. **Solid or liquid? (5 min).** Groups take back their cards and place them on "liquid water" or "solid ice". Cards 7 and 10 have both: ice on top and liquid water around it. Let groups put them between the mats and say why.

✓ Discussion questions (5 min, with answers)

1. "Name three places where we find water." (Any three: ocean, river, lake, pond, on a mountain, a stream, ice.)

2. "Where is the most water on Earth?" (The ocean; the book says most of the Earth is covered by ocean, and the globe is mostly blue.)
3. "Can water be solid?" (Yes, ice. Ice on mountains, on a pond in winter, icebergs.)
4. "How did we find out about ice quickly?" (We used the contents page and the heading.)

✓ Closing check (5 min, with answers)

Each child is given one picture card (or holds a real object). They say, sign or point: "Where is this water?" and "Is it liquid or solid?" (Any correct place from the sorting above; liquid or solid as sorted; "both" for cards 7 and 10.) Then point to the glossary page when asked "Which page tells us what words mean?"

Vocabulary

ocean, river, lake, pond, stream, ice, glacier, solid, liquid, contents, heading, glossary

Differentiation

- Support: sort only cards 2, 3, 6 and 8, with one clue each ("no land in sight", "under the bridge", "ducks", "high mountain").
- Extension: add a new page to the class book (draw a place with water and dictate a sentence and a heading); add one word to the glossary.
- Children can place cards by pointing, signing or AAC, or ask a partner to move them. Mats can go on a table for a wheelchair user.

⚠ Safety

- Ice cubes stay in the cup; children touch them for a few seconds only.
- Do not ask about children's holidays by the sea, swimming, or trips. Talk only about the pictures and Little Hill.

Teacher notes and misconceptions

- Children may think all water is the same. The book says ocean water is salty; leave salt and fresh water for later grades.
- Some children think a pond and a lake are different kinds of water. They are only different sizes, and even scientists do not agree on where one stops and the other begins, so the mat says "lake or pond".
- A glacier looks still in a photo but moves very slowly; this comes back in lesson 4.

Lesson 2: A model of Little Hill

Unit overview - Previous: Where is water found? - Next: Water and wind move sand

Back to the grade 2 year plan

Goal

Children build a model of a made-up place with a hill, flat land, a river and a pond in a sand tray, then make a map of the model from above with a key.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- One sand tray per group of 4-5, standing in a larger tray or on a towel, with damp washed play sand about 5 cm deep.
- Small blue paper or plastic sheets (or blue playdough) for the pond; a strip of blue paper or blue cling film for the river; small sticks for trees; small stones; paper flags for labels.
- The large Little Hill map from grade 1 society, if you have it.
- A3 paper and crayons for each group's map.
- Key symbol cards: hill, flat land, river, pond, trees, path.
- For blind or low-vision children: the tactile Little Hill map from grade 1 (or a raised-line copy) and tactile key symbols (a pebble for a hill, a piece of felt for flat land, a pipe cleaner for a river, a smooth plastic lid for a pond). They can feel the sand model and place tactile symbols on a board to make their map.

Steps

✎ Opening (5 min)

1. Show the Little Hill map (or describe it). "Who remembers this? It is Little Hill from above, like a bird flying over it. What does the key tell us?" (What the symbols mean.)
2. "A map is flat. Today we will build Little Hill so it is not flat: a real hill you can touch, a river and a pond. Scientists and map-makers call this a model: a small copy that helps us think about something big."

✎ Main activity (25 min)

1. **Plan (3 min).** Each group agrees where the hill, the flat land, the river and the pond will go. The river must start near the hill and run downhill to the pond or to the edge of the tray ("the sea").
2. **Build (12 min).** Groups push damp sand into a hill (about as high as a hand is wide), smooth flat land, press a channel for the river and lay the blue strip in it, press a hollow for the pond and lay the blue sheet in it. Add sticks for trees and stones for a path if there is time. Each group puts a paper flag on each feature: hill, flat land, river, pond.

3. **Look from above (2 min).** Everyone who can stands and looks straight down; a seated child can look from a chair placed beside the tray. "What does the hill look like from above?" (A round shape, a blob.) "How can a map show it is high?" (A symbol, a colour, a word; accept any idea.)
4. **Draw the map (8 min).** Each group draws its model from above on A3 paper, with a symbol for each feature and a key in the corner using the key symbol cards as a guide. Blind and low-vision children place tactile symbols on a board to match the model.

Keep the sand trays (damp, covered with a cloth) for lesson 3.

✓ Discussion questions (5 min, with answers)

1. "What is the difference between our model and our map?" (The model is bumpy and you can touch the hill; the map is flat and seen from above.)
2. "Why does a map need a key?" (So people know what each symbol means.)
3. "Which way will the river flow?" (Downhill, from near the hill to the pond or the sea.)
4. "Is our model the same size as a real town?" (No, it is much smaller. It is a model.)

✓ Closing check (5 min, with answers)

Each group swaps maps with another group. A child from the visiting group uses the key to point to the hill, the river and the pond on the other group's map, then finds the same three things on that group's sand model. (Points correctly; any matching is fine as long as it uses the key.)

Vocabulary

model, map, key, symbol, hill, flat land, river, pond, from above, downhill

Differentiation

- Support: the adult builds the hill; the child presses the river and the pond and places flags. Maps can use stickers instead of drawn symbols.
- Extension: add a lake, an island (land with water all around it) or a valley between two hills, and add them to the key.
- A partner can build while a child directs by pointing, signing or AAC. Put the tray on a table at a reachable height for a wheelchair user.

⚠ Safety

- Washed play sand only, kept damp. No throwing; hands below shoulder height. Wash hands after the lesson.
- Small stones must be too large to swallow (check your school's rules).
- Mop any spilled water at once.

Teacher notes and misconceptions

- Children may think a map shows everything. A map shows only what the map-maker chose and put in the key.
- Some children may draw the hill from the side (a triangle). That is a useful moment: "Is that how a bird sees it?" Accept both and talk about it.
- There is no right size for the model. The standard leaves out measuring to scale at this age.

Lesson 3: Water and wind move sand

Unit overview - Previous: A model of Little Hill - Next: Fast or slow?

Back to the grade 2 year plan

Goal

Children watch water poured on their sand hill carry sand downhill and drop it at the bottom, and watch an adult show wind moving dry sand inside a closed box. They say that moving water and wind can change the shape of the land.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- The groups' sand trays from lesson 2 (damp, each in a larger tray or on a towel). Take out the paper river and pond first.
- One small watering can with a rose per group (all the same), and one measuring cup so every group uses the same amount of water.
- Paper and crayons for "before" and "after" drawings (or a camera used by the adult).
- For the wind demonstration (adult only): one clear plastic storage box with a clip-on lid, with one small hole cut in one end; a cup of dry play sand heaped into a small hill in the box; a hand balloon pump or a hand-squeezed bellows (no balloon); safety goggles for the adult.
- Towels, a mop, hand-washing sinks.
- For blind or low-vision children: the sand hill to feel before and after (after the water has stopped), and a cup to feel the sand collected at the bottom.

Steps

✎ Opening (5 min)

1. Look at the models. "Last time we built Little Hill. What do you think will happen to our hill when it rains hard?" Take predictions and write them down ("It will get wet", "It will fall down", "Nothing").
2. Groups draw (or the adult photographs) their hill "before".

✎ Main activity (25 min)

1. **Rain on the hill (12 min).** Each group fills the watering can with one measuring cup of water. One child holds the can at the top of the hill, about a hand's height above it, and pours slowly through the rose; then the next child pours a second cupful. Everyone watches the side of the hill and the flat land at the bottom.

2. Ask while they watch: "Where is the water going?" (Down the hill.) "Is it carrying anything?" (Sand.) "Where is the sand stopping?" (At the bottom, on the flat land, in the river or the pond hollow.)
3. **After (3 min).** Groups draw the hill "after" (or the adult photographs it). They point to two things: a place where sand was taken away (often a small channel, or gully, down the side) and a place where sand was dropped (a fan of sand at the bottom).
4. **Wind (adult demonstration, 7 min).** Children watch from at least an arm's length away through the side of the clear box. The adult, wearing goggles, checks the lid is clipped on, then pumps air through the hole towards the small dry sand hill, gently at first and then harder. "What is the moving air doing to the sand?" (Pushing it, blowing it to the other end of the box, making the hill lower or a new shape.) Leave the lid on until the sand has settled.
5. **New word (3 min).** "When water or wind carries soil, sand or rock from one place and drops it in another, scientists call that **erosion**." Write it on the word wall with two arrows: "taken away" and "dropped".

Keep the trays for lesson 5 (smooth the sand and rebuild later).

✓ Discussion questions (5 min, with answers)

1. "Was your prediction right?" (Children compare; any honest answer.)
2. "Where did the sand go?" (Down the hill to the bottom, the flat land, the river or the pond hollow.)
3. "What moved it?" (The water. In the box, the moving air: the wind.)
4. "Where in real life might water carry sand or soil away?" (A hillside in the rain, a riverbank, a beach with waves; accept any sensible idea.)

✓ Closing check (5 min, with answers)

Show the "before" and "after" drawings (or photos) of one group's hill. Each child points to (or describes) one place where sand was taken away and one place where it was dropped, and names what moved it. (Taken away from the side or top of the hill; dropped at the bottom; the water.)

Vocabulary

erosion, carry, drop, gully, downhill, wind, predict, before, after

Differentiation

- Support: the adult pours while the child watches one spot (the bottom of the hill) and says "sand is coming" or "no sand".
- Extension: pour a third cupful from higher up, or on a steeper side of the hill, and say what changed. (Usually more sand moves on the steep side.)
- A partner can pour while a child directs. Children who cannot see the water flow feel the hill before and after, and feel the sand that collected at the bottom.

⚠ Safety

- Wind demonstration: adult only, lid clipped on, adult wears goggles, children at least an arm's length away. Never a hair dryer or an electric fan near water. No balloons.
- Keep the sand damp; no throwing; wash hands afterwards.
- Mop spills at once; wet floors are slippery.

Teacher notes and misconceptions

- Children may think the water "made" new sand. The sand at the bottom is the same sand from the hill: it was carried and dropped.
- Children may think only big floods move land. Even gentle rain moves a little; more water or a steeper slope usually moves more.
- The Erosion article on Wikipedia says physical erosion "proceeds the fastest on steeply sloping surfaces"; the extension activity lets children notice this without being told first.

Lesson 4: Fast or slow?

Unit overview - Previous: Water and wind move sand - Next: Protect the hill

Back to the grade 2 year plan

Goal

Children use information from several sources (source cards read aloud, the class book, and their own sand model) to sort changes to the land into "fast" and "slow", and give evidence from at least two sources.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- Six source cards (below). Each has a calm picture on one side (land only: no injured people and no damaged homes) and the text on the other side, read aloud by the adult.
- Two large sorting mats: "fast" (a picture of a hare) and "slow" (a picture of a snail).
- The groups' "before" and "after" drawings or photos from lesson 3.
- The class information book from lesson 1 (page 5, "Ice").
- Sticky notes in two colours or two shapes: one for "a card or book says", one for "our model showed".
- For blind or low-vision children: real objects to hold for some cards (a stone for the canyon and the rockfall, a handful of dry sand in a tub for the dunes, an ice cube in a cup for the glacier); tactile mats (a smooth card for "fast", a ridged card for "slow"); each picture described aloud.

The six source cards (the author's own text, based on the Wikipedia

articles listed in the unit's Sources)

- **A. The canyon.** Picture: the Grand Canyon, a very deep valley with a river at the bottom. Text: "This is the Grand Canyon in Arizona, in the United States. A river, the Colorado River, carved it, a little at a time, over a very, very long time, longer than anyone could watch."
- **B. The rockfall.** Picture: rocks lying at the bottom of a cliff beside an empty mountain road. Text: "Rocks broke off a cliff and fell down the slope in a few seconds. A rockfall is one kind of landslide."
- **C. The sand dunes.** Picture: sand hills in a desert, with ripples on them. Text: "Wind blows sand into hills called dunes. The wind moves a little sand at a time, and a dune changes its shape slowly."
- **D. The glacier.** Picture: a glacier between two mountains. Text: "A glacier is a huge river of ice. It moves downhill, but so slowly that you cannot see it move."
- **E. The earthquake.** Picture: a long crack across an empty field. Text: "In an earthquake the ground shakes. It happens suddenly. Grown-ups who study earthquakes work hard to help people stay safe."
- **F. The volcano.** Picture: a mountain far away with a cloud of ash above it. Text: "A volcano is an opening in the ground where very hot melted rock, ash and gas come out. When a

volcano erupts, it can change the land very quickly. Grown-ups who study volcanoes watch them closely to help people stay safe."

Steps

✎ Opening (5 min)

1. Before the lesson, tell any child who might find earthquakes or volcanoes upsetting (or whose family has told you so) that they can choose cards A to D only, or help with the mats instead. Never ask a child in front of the class.
2. Show the lesson 3 drawings. "How long did it take the water to move our sand?" (A few minutes; while we watched.) "So was that fast or slow?" (Fast.) "Today we will find out about real changes to land. Some are fast and some are so slow that nobody can watch them happen."

✎ Main activity (25 min)

1. **Read the cards (10 min).** Show each card's picture, then read its text aloud. After each one ask: "Fast or slow? What words told you?" Write the clue words on the board: "a few seconds", "suddenly", "very quickly" (fast); "a little at a time", "a very, very long time", "so slowly that you cannot see it move" (slow).
2. **Sort with evidence (10 min).** Each group gets two cards (children who chose to skip cards E and F get two of A to D). Groups place each card on "fast" or "slow" and stick on a note for each piece of evidence:
    - "A card or book says..." note: the clue words on the card, or page 5 of the class book ("ice ... on high mountains all year").
    - "Our model showed..." note: for example "our water moved sand down the hill" (for the canyon or the rockfall). Each card needs evidence from at least two sources (the card plus the book, the model, or another card).
3. **Expected sorting (5 min).** Check together. Fast: B (rockfall), E (earthquake), F (volcano). Slow: A (canyon), C (dunes), D (glacier). Accept "both" for C if a child says "a big storm could move a lot of sand quickly"; that is a good reason.

✓ Discussion questions (5 min, with answers)

1. "Our water moved sand in a few minutes. Why did the river take so long to make the canyon?" (Rock is much harder than sand; the river wears it away a little at a time.)
2. "Which changes could you watch with your own eyes?" (Fast ones: a rockfall, our sand model. Not the canyon or the glacier.)
3. "How do we know about slow changes if nobody can watch them?" (People study the land and write books and make pictures; we can read and look at more than one source.)
4. "Why is it good to use more than one source?" (If two sources say the same, we can be more sure.)

✓ Closing check (5 min, with answers)

Hold up a card the child has not sorted (or describe it). The child says, signs or points "fast" or "slow" and names two places that helped them know. (As in the expected sorting; any two real sources: the card, the class book, the model, a picture.)

Vocabulary

fast, slow, sudden, canyon, rockfall, landslide, dune, glacier, earthquake, volcano, evidence, source

Differentiation

- Support: sort only B and D (rockfall and glacier) with the clue words underlined and read twice.
- Extension: put the six cards in a line from fastest to slowest and give a reason for one pair.
- Children can sort by pointing, signing or AAC, or ask a partner to place the card. Mats can go on a table for a wheelchair user.

⚠ Safety

- Use calm pictures of land only. Never show injured people, damaged homes or news footage. Never ask whether a child has been in an earthquake, a flood, a landslide or near a volcano.
- Any child can skip cards E and F with no reason given. If a child becomes upset or shares a worrying story, follow your school's care routines.
- Stones used as objects must be too large to swallow.

Teacher notes and misconceptions

- Children may think the canyon was made by one big flood. Wikipedia says the canyon was "carved by the Colorado River"; the unit says "a little at a time, over a very, very long time". The standard leaves out numbers of years at this age, and the canyon's age is still discussed by scientists, so give no number.
- Children may think "slow" means "not happening". The glacier and the dune are moving all the time, just too slowly to see.
- Volcanoes and earthquakes are named here only as fast events. How they happen is left for later grades.

Lesson 5: Protect the hill

Unit overview - Previous: Fast or slow?

Back to the grade 2 year plan

Goal

Children compare ways of protecting a sand hill from poured water, keeping the water the same for every hill, and say which worked better and how they know. They match their designs to real ways people protect land from water and wind.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5. The one-to-one assessment (see Assessment in the unit overview) happens during this lesson or the following week.

Materials

- Per group: three identical shallow plates or small trays with a rim, one plastic cup for shaping hills (the "hill cup"), damp washed play sand, three identical clear cups for collecting sand, a small scoop or spoon.
- Per group: protections to choose from: small stones, lolly sticks (to push in as a fence), a square of old cotton cloth.
- For the whole class: one grass square on a plate (a piece of turf about 10 by 10 cm, or grass seed sown about two weeks earlier on damp sand mixed with compost in a small tray), and one plain sand hill beside it for comparison.
- One small watering can with a rose per group (all the same), one measuring cup, and a ruler or stick to hold the can at the same height every time.
- The class results chart (columns: hill, protection, kept its shape?, sand in the cup: a little, some or a lot).
- Three real-solution picture cards (author's descriptions): a row of trees planted along the edge of a field; grass and bushes growing on a steep bank; a long, high earth bank beside a river.
- Towels, a mop, a bucket for used sand, hand-washing sinks.
- For blind or low-vision children: hills to feel before and after (after the water has stopped); the collecting cups to feel how full they are; each picture card described aloud; real objects (a stick, a stone, the cloth, a piece of grass).

Steps

✎ Opening (5 min)

1. "In lesson 3 the water carried sand off our hill. People who live on hills and by rivers have the same problem. Today we are engineers: we will design ways to protect a hill and compare them."

2. "To compare fairly, what must be the same for every hill?" Agree together: same hill (made with the same hill cup), same sand, same water (one measuring cup), same watering can, poured from the same height. "Only the protection changes."

✎ Main activity (25 min)

1. **Make three hills (5 min).** Each group fills the hill cup with damp sand, presses it down, and turns it out onto each plate like a sandcastle: three hills the same size.
2. **Choose and add protections (5 min).** One hill gets **no protection**, so we can compare. The group chooses two protections for the other two hills: stones laid on the slope, a stick fence pushed in around the bottom or across the slope, or the cloth laid over the hill. (Across the class, try to test each one.)
3. **Pour (7 min).** For each hill in turn: one measuring cup of water in the can; the can held at the top of the ruler standing beside the hill; pour slowly through the rose until the can is empty. Everyone watches.
4. **Collect and compare (5 min).** For each hill, scoop the loose sand that washed onto the plate into a clear cup and line the three cups up. Look at each hill: did it keep its shape? Fill in the class results chart with "a little", "some" or "a lot".
5. **The grass square (3 min, adult).** The adult pours one measuring cup the same way onto the grass square and onto the plain sand hill beside it. "What did the roots do?" (Held the soil; less washed away.) Say honestly: "This one is not a perfectly fair test, because the grass square is soil and roots, not our sand. But it gives us a clue."

✓ Discussion questions (5 min, with answers)

1. "Which protection kept the most sand on the hill? How do you know?" (Each group's own result. Evidence: less sand in the cup, the hill kept its shape.)
2. "Why did we keep one hill with no protection?" (To compare; to see if the protection made any difference.)
3. "Did every group get the same result?" (Maybe not. Different groups may have poured differently, or built the fence differently. That is why engineers test more than once.)
4. Show the three real-solution cards. "Which of our designs is most like each one?" (Row of trees: a bit like the stick fence; it slows the wind across a field. Grass and bushes on a bank: like the grass square; roots hold the soil. Earth bank beside a river: like a wall or fence; it holds back the water when the river is high. Accept other good matches.)

✓ Closing check (5 min, with answers)

Each child answers one of these, by saying, signing, pointing or drawing:

- "Which protection worked better in your group, and how do you know?" (Their result, with evidence from the cups or the hill shape.)
- "What did we keep the same?" (The water, the can, the height, the hill size.)
- Pointing to a real-solution card: "What does this protect?" (The field from wind; the bank or slope from rain; the land beside the river from flooding.)

Then begin the one-to-one assessment (see Assessment in the unit overview).

Vocabulary

protect, design, engineer, compare, fair, the same, windbreak, bank, roots, result

Differentiation

- Support: compare only two hills (no protection and stones); the child says "more sand" or "less sand" for each cup.
- Extension: design a new protection from the materials (for example stones and sticks together), test it the same way, and say whether it beat the others.
- A partner can pour while a child directs. Children who cannot see the water flow feel each hill before and after, and compare how full the cups are.

⚠ Safety

- Washed play sand only, kept damp; no throwing; wash hands afterwards.
- Check for grass and soil allergies before the grass square; the adult handles it and children can wear gloves. Wash hands afterwards.
- Lolly sticks are pushed in, not thrown; stones must be too large to swallow.
- Mop spills at once; wet floors are slippery.

Teacher notes and misconceptions

- Children may say "the cloth worked best, so it is the best for real hills". A cloth over a real hill would stop plants growing. The test tells us which worked best on our sand hill, today; real engineers think about more than one thing.
- Results will vary between groups. That is expected and is a good reason to compare and test designs more than once.
- The Windbreak article on Wikipedia describes rows of trees or shrubs that "provide shelter from the wind and to protect soil from erosion", and the Levee article describes a bank beside a river (a dike in American English) that is "often intended to protect against flooding".

Grade 2 Science: Habitats, Seeds and Helpers (5 lessons, about 3 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 every safety note against your school's rules.
>
> Text-checked by three other agents (Gemini 3.8 Flash, Gemini 4 Carbon and Gemini 4 Argon); see Known gaps.

Back to the grade 2 year plan - Term 3. Builds on grade 1 science: What do plants need?, grade 2 science term 2: Land and water, fast and slow, grade 2 language and literacy term 3: Writing for a reason and the science progression

Big idea

A habitat is a place where living things find what they need. Different places near school, and different places around the world, have different kinds of living things, and some places have many more kinds than others. Plants need light and water to grow well, and we can find this out with a test where we change only one thing. Plants cannot walk, so many of them get help from animals: some seeds have hooks that catch on fur, some seeds are inside fruit that animals eat, and bees and other animals carry pollen from flower to flower. We can build models that work like these animal helpers.

This is the third science unit of grade 2 (term 3). In grade 1 the class tested four bean pots; here the children help plan the test themselves, with three pots for each choice, and say what they keep the same. The grade 2 literacy unit Writing for a reason reads fact pages about what a seed needs and how seeds get about; this unit tests those ideas.

Outcomes

By the end of the unit most children can:

1. Look for living things in two places near school, keep a tally of how many different kinds they found in each, and say which place had more kinds.
2. Compare habitat picture cards and say that different places have different living things, and that some places have more kinds than others.
3. Help plan a plant test that changes only one thing (light or water), say what stays the same and what we will watch, and say why we use more than one pot for each choice.
4. Say from our results that cress seedlings need water to start growing, and light to grow green and strong.
5. Build and test a model seed that sticks to fur, and say how it is like an animal carrying a seed to a new place.
6. Use a model to show how a bee carries pollen from one flower to another.

Prior knowledge

- Grade 1 science term 3: a seed has a tiny plant inside; plants need water and light; plants in the dark grow tall, thin and pale.

- Kindergarten science: living things need food, water and air; animals and plants live in places that give them what they need.
- Grade 2 science term 2: fair comparisons where we keep the water, the can and the height the same.
- Grade 2 mathematics: tally marks and simple bar graphs.
- No reading is needed. Picture cards and the habitat pictures are described aloud by an adult.

Lessons

Each lesson is about 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5. Teach about two lessons a week. Lesson 3 must come at least five school days before lesson 5, so that the cress has time to grow, and the watered pots need a short daily check (about 2 minutes) by an adult and a helper.

1. Who lives here?: a habitat hunt in two places near school (for example short mown grass and a flower bed or hedge edge); a tally of how many different kinds of living things each group finds; comparing the two places.
2. Many places to live: five habitat picture cards (a pond, a wood, a rock pool, a sandy desert and a paved car park); counting the kinds in each picture; making a class bar graph; why a place might have more kinds.
3. Planning a fair plant test: asking "Does cress need light?" and "Does cress need water?"; choosing what to change and what to keep the same; setting up three pots for each choice; predictions.
4. Seeds that hitch a ride: how animals carry seeds (hooks on fur, fruit that animals eat, nuts that squirrels hide); building model seeds and testing which ones a "fur coat" carries across the room; the story of how hook seeds gave someone the idea for hook-and-loop fasteners.
5. Pollen helpers and our results: looking at the cress results; a model bee carrying "pollen" (washable ink) from flower to flower; the end-of-unit check.

Materials (whole class unless noted)

- **Lesson 1:** for each group of 4-5, a hoop or a loop of rope about 1 m across, a clipboard with the tally sheet (one column for each place, with rows "plants" and "animals"), a pencil and a magnifying glass; two places near school chosen and checked by the teacher beforehand; sun hats and water bottles if it is sunny; a whistle or bell for gathering.
- **Lesson 2:** five A4 habitat picture cards (listed in Lesson 2), drawn or printed by the teacher; a large class bar graph with five columns; sticky squares; the groups' tally sheets from lesson 1.
- **Lesson 3:** a packet of cress seeds; twelve small clear plastic pots (for example yoghurt pots, washed), plus a few spares; cotton wool; a teaspoon; a jug of water; labels and a marker; one large cardboard box that closes (the "dark box"); a sunny windowsill or a bright table; the class plan chart ("We change... / We keep the same... / We will watch..."); a prediction chart with two columns ("I think..." and "We saw...").
- **Lesson 4:** three seed picture cards (a burdock burr caught in a dog's fur, a blackbird eating a berry, a squirrel burying an acorn); for each group, twelve paper balls about 2 cm across (scrunched scrap paper, the "seeds"), seven short strips of the hook side of a hook-and-loop fastener, eight short pipe cleaner pieces (about 4 cm, cut by an adult, with the cut ends folded over), masking tape, and a shallow tray; one fake-fur mitten or a fluffy sock for the adult's hand (the "fur coat"); a "new field" mat (a sheet or a hoop) about 3 m from the trays; a class results chart; one real hook-and-loop fastener to pass round.

- **Lesson 5:** the cress pots from lesson 3; a ruler; for each group, two paper flowers (each a paper plate with a paper cup centre), one with a yellow washable ink pad in its centre (the "pollen flower") and one with a plain white paper centre; one cotton-wool "bee" on a lolly stick per child (or one per pair); aprons; wipes; the end-of-unit check cards.
- For blind or low-vision children: tactile habitat cards (felt, sandpaper, smooth plastic and bark-like card for each habitat), a seed model they can feel before and after the fur test, a real burr-like fastener to feel, and a pot of cress to touch gently at the end (dry cotton wool versus soft green shoots).
- Hand-washing sinks, paper towels.

⚠ Safety and access

- **Outside (lesson 1).** Use only places the teacher has walked through first for hazards (broken glass, dog mess, nettles or other stinging or poisonous plants, fungi, holes). Agree the boundary and the gathering signal before going out. Hats, sun cream and water as your school requires.
- **Living things.** Look, do not touch. Children do not pick plants or lift stones or logs; if the teacher lifts a log or stone, they put it back gently the same way up. Nothing is taken back to class. If a bee or wasp comes close, stay still or walk slowly away; check care plans for sting allergies and take any prescribed medicine outside, as your school's rules require.
- **Allergies.** Check for grass, pollen, plant and fur allergies before lessons 1, 4 and 5. The "fur coat" is fake fur, worn only by the adult.
- **Seeds.** The adult holds the seed packet and sprinkles the cress seeds. Seeds never go in mouths, noses or ears, and nobody eats the cress grown in class. Wash hands after handling pots and cotton wool.
- **Nuts.** Lesson 4 shows a squirrel and an acorn only as a picture card. No real nuts or acorns come into class.
- **Ink (lesson 5).** Use a washable, non-toxic ink pad; aprons on; wipes ready.
- **Small parts.** Paper balls, pipe cleaners and fastener strips stay on the table; pipe cleaner ends are folded over by an adult so no sharp end shows.
- Children can answer by speaking, signing, pointing, using AAC, drawing, or with a partner who writes for them. Their own way counts.
- Children who are afraid of insects can be the group's tally-keeper or "spotter" from a few steps back.
- Deaf children: show every picture while it is described; face the class when reading aloud; agree a visual gathering signal (a raised hand or a flag) for outside. Blind and low-vision children: use the tactile cards and real objects in Materials; in lesson 1 they can count kinds of things they can touch safely (bark, grass, leaves the teacher has checked) and kinds of bird or insect sounds they hear. Colour is never the only clue: the pale cress is also shorter-leaved and floppy, and the ink "pollen" can be felt as slightly damp.
- Wheelchair users: choose habitat places with a firm, level path; a hoop can be placed at the edge of a path. A partner can do the fur test while the child directs.

Assessment

Watch and listen during lessons, and use the closing checks. During lesson 5 or the following week, see each child for about 3 minutes with the cards, a seed model and two cress pots (answers in brackets):

1. Show the child their group's tally sheet from lesson 1. "Which place had more kinds of living things? How do you know?" (The place with more tally marks; "we counted more".) (Outcome 1.)
2. Show the pond card and the car park card from lesson 2. "Which picture has more kinds of living things? Why might a place have more kinds?" (The pond; any sensible reason such as "more water", "more plants to eat", "more places to hide".) (Outcome 2.)
3. "In our light test, what did we change? What did we keep the same? Why did we use three pots and not one?" (Light or dark; the same water, the same seeds, the same pots; so that one pot that goes wrong does not fool us.) (Outcome 3.)
4. Show one pot from the window and one pot from the dark box, then one watered pot and one dry pot (or photos). "What does cress need? How do you know?" (Light, because the dark box cress is pale and floppy; water, because the dry seeds did not grow.) (Outcome 4.)
5. Show a plain paper seed and a paper seed with hook strips. "Which seed would a dog carry to a new place? Why?" (The hook seed; the hooks catch on the fur, like a burr.) (Outcome 5.)
6. Give the child a cotton-wool bee and the two paper flowers. "Show me how the bee helps the flower." (Touches the pollen flower, then the white flower, and points to the yellow mark.) "What did the bee carry?" (Pollen.) (Outcome 6.)

Sources

Quoted exactly; the unit is not a full alignment to these standards.

- Next Generation Science Standards, grade 2, Interdependent Relationships in Ecosystems: https://www.nextgenscience.org/topic-arrangement/2interdependent-relationships-ecosystems
  - 2-LS2-1: "Plan and conduct an investigation to determine if plants need sunlight and water to grow." Assessment boundary: "Assessment is limited to testing one variable at a time."
  - 2-LS2-2: "Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants."
  - 2-LS4-1: "Make observations of plants and animals to compare the diversity of life in different habitats." Clarification statement: "Emphasis is on the diversity of living things in each of a variety of different habitats." Assessment boundary: "Assessment does not include specific animal and plant names in specific habitats."
- Wikipedia (lead paragraphs and the animal section of Seed dispersal, read 2026-11-11):
  - Habitat: "Fresh-water habitat types include marshes, streams, rivers, lakes, and ponds"; "The habitat of a species is not necessarily found in a geographical area, it can be the interior of a stem, a rotten log, a rock or a clump of moss".
  - Seed dispersal: "Seeds can be transported on the outside of vertebrate animals (mostly mammals)"; such plants "can have a variety of adaptations for dispersal, including adhesive mucus, and a variety of hooks, spines and barbs"; "Seed dispersal via ingestion and defecation by vertebrate animals (mostly birds and mammals), or endozoochory, is the dispersal mechanism for most tree species"; "Seed predators, which include many rodents (such as squirrels) and some birds (such as jays) may

also disperse seeds by hoarding the seeds in hidden caches ... if left uneaten will grow into new plants."
    - Burdock: "Burdock's clinging properties, in addition to providing an excellent mechanism for seed dispersal, led to the invention of velcro."
    - Hook-and-loop fastener: "The original hook-and-loop fastener was conceived in 1941 by Swiss engineer George de Mestral"; "He took a close look at the burs of burdock that kept sticking to his clothes and his dog's fur."
    - Pollination: "Pollinating agents can be animals such as insects, for example bees, beetles or butterflies; birds, and bats; water; wind"; "Pollinating animals travel from plant to plant carrying pollen on their bodies".
    - Cress: "a fast-growing, edible herb".
    - Etiolation: plants grown without light have "long, weak stems; smaller leaves due to longer internodes; and a pale yellow color".

Known gaps and cautions

- One other agent (Gemini 3.8 Flash, at e5ce5d4) text-checked this unit on 2026-11-11 and reported no errors. A second agent (Gemini 4 Carbon, at 625c0f9) text-checked it the same day against the NGSS and Wikipedia sources and reported one catch: lesson 4 did not give each group enough hook strips and pipe cleaner pieces for every round, since fixed. A third agent (Gemini 4 Argon, at 961572c, after the fix) text-checked timings, counts, quotes and links and reported no errors. Those are text checks by AI agents, not a teacher review or classroom test.
- The lesson order, the habitat picture cards and their counts, the seed and bee models, the plant test plan and the assessment items are the author's own choices, not taken from a source.
- The habitat picture cards are made-up pictures. Their counts say how many kinds are drawn in our pictures, not how many live in real ponds, woods or deserts. Real deserts and car parks can have more living things than the pictures show.
- Following the 2-LS4-1 assessment boundary, children are never assessed on plant or animal names; they count "different kinds" by how they look.
- Grade 1 term 3 science already tested what plants need. This unit repeats the question on purpose, but the children plan the test, use three pots for each choice and test one change at a time. Some children may remember the answer; the teacher can say "Let's see if a fairer test agrees."
- Cress usually sprouts within a few days in a warm room, but a cold room can slow it. Plant spare pots. Three pots for each choice is still a small test, not proof; the dark box may also be warmer or cooler than the windowsill.
- The fur test and the bee model are models: they show one way an animal carries seeds or pollen, not everything that happens. Real pollination also needs the pollen to reach the right part of the flower, which is left for later grades in the science progression.
- Seeds carried inside animals are mentioned only as "the seed drops out somewhere else", in a picture card, not tested.
- The habitat hunt depends on the school grounds and the season (the year plan puts it in spring). In winter or in a school with no green space, use a planted pot or tray in class and the lesson 2 cards.
- Timings are untested guesses. Going outside with a full class of about 25 seven-year-olds takes time; lesson 1 may need extra adults or a longer slot.
- No images yet.

Lesson 1: Who lives here?

Unit overview - Next: Many places to live

Back to the grade 2 year plan

Goal

Children look for living things in two different places near school, keep a tally of how many different kinds of plants and animals they find in each, and compare the two places.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- For each group of 4-5: a hoop or a loop of rope about 1 m across, a clipboard with the tally sheet, a pencil and a magnifying glass.
- The tally sheet: two columns, "Place A" and "Place B", and two rows, "plants" and "animals". Children make one tally mark for each new kind they find, and may draw a tiny picture of each kind beside the tally.
- Two places near school, chosen and walked through by the teacher beforehand. Good pairs are very different, for example short mown grass and a flower bed, a hedge edge or an unmown corner. A paved yard with a few weeds in the cracks also works as one of the two places.
- A whistle or bell, or a raised flag for the gathering signal.
- Sun hats and water bottles if it is sunny.
- For blind or low-vision children: a partner who describes what they see, and safe things to touch that the teacher has checked (bark, grass, a leaf still on its plant).

Steps

✎ Opening (5 min)

Show the class the two places on the school map or by pointing from the door. Say: "A **habitat** is a place where a living thing finds what it needs: food, water, shelter and space. Today we are habitat detectives. We will not find out the names of things. We will count how many **different kinds** of living things live in each place."

Model the tally on the board: "If I see one ant, I make one mark for ants. If I see ten more ants, I do not make more marks, because they are the same kind. If I see a beetle, that is a new kind, so I make a new mark." Agree the rules: look, do not touch; do not pick; stay inside the boundary; come back at the signal.

✎ Main activity (25 min)

- **Place A (10 min).** Each group puts its hoop down where the teacher shows. Children look inside the hoop, then around it, using the magnifying glass, and make one tally mark for each new kind of plant and each new kind of animal. Different-looking leaves count as different kinds of plant. Remind them to look low: under leaves, in cracks, on stems.
- **Move (3 min).** Signal, gather, walk together to place B.
- **Place B (10 min).** The same: hoop down, look, tally.
- **Back together (2 min).** Gather in the shade or go back to class.

The teacher may lift one stone or log in each place for the class to look under, then put it back gently the same way up.

✓ Discussion questions (5 min, with answers)

- "Which place had more kinds of living things?" (Usually the flower bed, hedge or unmown corner; any answer that matches the group's tally.)
- "How do you know?" (We made more tally marks there.)
- "Why do you think one place had more kinds?" (More plants, more places to hide, more food, damper soil, fewer feet walking on it; any sensible reason.)
- "Did every group find the same number? Why not?" (No; groups looked in different spots, and some animals moved away or hid.)

✓ Closing check (5 min, with answers)

Each child shows with fingers, or points on the tally sheet:

1. "How many different kinds did your group find in place A?" (Their own count.)
2. "In place B?" (Their own count.)
3. "Which place had more kinds?" (The place with the bigger number.)

Vocabulary

habitat, living thing, kind, tally, compare, more, fewer

Differentiation

- **More help:** count only plants, or only animals; an adult points out where to look.
- **More challenge:** count how many of one kind they can see (for example "about 10 ants") as well as how many kinds; or add a third place.
- Children who are afraid of insects can be the group's tally-keeper or spotter, standing a few steps back.

⚠ Safety

- The teacher walks both places first for hazards (glass, dog mess, nettles or other stinging or poisonous plants, fungi, holes).
- Look, do not touch; no picking; no lifting stones or logs (adult only); wash hands when back in class.
- Bees and wasps: stay still or walk slowly away. Check care plans for sting allergies.
- Sun hats, sun cream and water as your school requires. Keep a clear gathering signal that every child can see or hear.

Teacher notes and misconceptions

- Some children think only animals count as "living things". Point out that grass, weeds and trees are living things too.
- Children may count the same kind twice (two snails = two kinds). Model it again: same kind, one mark.
- A place with lots of one kind (a lawn full of grass) can still have few kinds. That difference is the point of the lesson.
- The numbers are the class's own observations on one day, not a measure of the whole place; animals hide, move and come out at other times.
- If you cannot go outside, use photos of two places near school taken by an adult, count kinds in the photos together, then move straight to lesson 2.

Lesson 2: Many places to live

Unit overview - Previous: Who lives here? - Next: Planning a fair plant test

Back to the grade 2 year plan

Goal

Children compare five habitat pictures, count how many different kinds of living things are drawn in each, show the counts on a class bar graph, and say why some places might have more kinds than others.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- Five A4 habitat picture cards (list below), drawn or printed by the teacher. Each kind is drawn once or more, but children count kinds, not animals.
- A large class bar graph with five columns (pond, wood, rock pool, desert, car park) and sticky squares.
- The groups' tally sheets from lesson 1.
- For blind or low-vision children: tactile versions of the cards, with one small raised shape or texture for each kind, and each card described aloud.

The five habitat picture cards (the author's own pictures)

The names in brackets are for the teacher only. Children are not asked to learn or say them.

- **Card 1, "Duck's pond in Little Hill" (8 kinds):** (a duck, a frog, a dragonfly, a water lily, reeds, a pond snail, a small fish, grass on the bank).
- **Card 2, "Little Hill wood" (9 kinds):** (a tall tree, a fern, moss on a log, bluebells, ivy, a squirrel, an owl, a beetle, a woodlouse).
- **Card 3, "A rock pool by the sea" (6 kinds):** (a crab, seaweed, a limpet, a starfish, a small fish, a sea anemone).
- **Card 4, "A sandy desert" (4 kinds):** (a cactus, a small bush, a lizard, a beetle).
- **Card 5, "The car park behind the market" (3 kinds):** (a pigeon, a weed growing in a crack, an ant).

Steps

✎ Opening (5 min)

Look again at the lesson 1 tally sheets. "Last time, one place had more kinds than the other. Today we visit five more places, in pictures. Some are near Little Hill and some are far away."

✎ Main activity (25 min)

- **Look and count (15 min).** Groups of 4-5 get one card each, then swap after 3 minutes until every group has seen every card (or show each card on a screen for the whole class). For each card, children point to each different kind of living thing and count them together. Remind them: "Same kind, count once."
- **Bar graph (10 min).** Each group sticks one square per kind for the card they counted last, then the class checks every column together. The teacher fixes any column that does not match the agreed count.

✓ Discussion questions (5 min, with answers)

- "Which picture has the most kinds?" (The wood, 9.) "The fewest?" (The car park, 3.)
- "How many more kinds are in the pond picture than in the desert picture?" (8 - 4 = 4 more.)
- "Why might the wood or the pond have more kinds than the car park?" (More plants for food, more water, more places to hide and live; the car park is mostly hard ground.)
- "Are these the real numbers for every pond and every desert?" (No; these are our pictures. Real places can have many more living things, some too small to see.)

✓ Closing check (5 min, with answers)

Point to the bar graph:

1. "Which column is tallest?" (The wood.)
2. "Which has more kinds, the rock pool or the desert?" (The rock pool.)
3. "Point to the place most like our place B from last lesson." (Any sensible choice with a reason.)

Vocabulary

habitat, kind, pond, wood, desert, rock pool, bar graph, most, fewest

Differentiation

- **More help:** count with a counter on each kind; use only three cards.
- **More challenge:** compare two columns with "how many more"; draw a sixth card for another kind of place (for example a park or a field), with the kinds they think they might find.
- Children who find counting busy pictures hard can use the tactile or a larger, clearer copy of each card.

⚠ Safety

- No special hazards. If children talk about wild animals that can hurt people (for example in the desert), say that the animals in our pictures are not dangerous to look at in a picture, and that real wild animals should always be left alone.

Teacher notes and misconceptions

- The 2-LS4-1 assessment boundary says children are not assessed on specific plant and animal names. Use the names only if children ask.
- Children may think deserts have no life at all. The desert card shows that some plants and animals do live there.
- Some children think a car park is not a habitat. Point out that the pigeon, the weed and the ant find what they need there.
- These are made-up pictures, so their numbers show only what is drawn.

Lesson 3: Planning a fair plant test

Unit overview - Previous: Many places to live - Next: Seeds that hitch a ride

Back to the grade 2 year plan

Goal

Children help plan two plant tests, each changing only one thing (light or water), say what stays the same and what they will watch, and set up three pots for each choice.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- A packet of cress seeds (held by the adult).
- Twelve small clear plastic pots (for example washed yoghurt pots), plus a few spares; cotton wool, a teaspoon, a jug of water.
- Labels and a marker.
- One large cardboard box that closes (the "dark box").
- A sunny windowsill or a bright table.
- The class plan chart, with three rows: "We change...", "We keep the same...", "We will watch...".
- The prediction chart, with two columns: "I think..." and "We saw..." (the second column is filled in during lesson 5).
- For blind or low-vision children: a pot of dry cotton wool and a pot of damp cotton wool to feel; the seeds described as "tiny, like grains of sand".

Steps

✎ Opening (5 min)

Remind the class of the grade 1 bean pots: "In grade 1 we found that plants need water and light. Today we plan a better test, with **cress**, a small plant that grows fast. We ask two questions: Does cress need **light**? Does cress need **water**?"

✎ Main activity (25 min)

- **Plan the light test together (8 min).** Ask: "What will we change?" (Light or dark: some pots on the windowsill, some in the dark box.) "What must stay the same?" (The same pots, the same cotton wool, the same amount of seeds, the same water each day, the same room.) "What will we watch?" (Do the seeds grow? How tall? What colour?) Write the answers on the plan chart.
- **Plan the water test (5 min).** Children say it themselves: "We change... (water or no water). We keep the same... (pots, seeds, cotton wool, all on the windowsill). We watch... (do the seeds grow?)."

- **Why three pots? (2 min).** "What if one pot gets knocked over, or its seeds are bad? With three pots, one pot that goes wrong does not fool us."
- **Set up (10 min).** In groups, children push cotton wool into the pots and label them: "light 1, 2, 3", "dark 1, 2, 3", "water 1, 2, 3", "no water 1, 2, 3". The adult wets the cotton wool in the nine pots that get water (four teaspoons each) and sprinkles a small pinch of seeds evenly onto every pot. The three "no water" pots get dry cotton wool and seeds only. Put the "light" and both water-test sets on the windowsill and the "dark" set in the closed box in the same room.

Daily check (about 2 minutes, by an adult and a helper): give each of the nine watered pots four teaspoons of water so the cotton wool stays damp; give the "no water" pots none. Open the dark box only for the check, then close it.

✓ Discussion questions (5 min, with answers)

- "In the light test, which pots get water?" (All of them, the same amount.) "Why?" (So only the light changes.)
- "In the water test, why are all the pots on the windowsill?" (So only the water changes.)
- "What would go wrong if the dark pots got no water?" (We would not know if light or water made the difference.)

✓ Closing check (5 min, with answers)

Each child puts a sticker or a mark on the prediction chart:

1. "What will the dark box cress look like?" (Any prediction; there is no wrong prediction.)
2. "Will the no-water seeds grow?" (Any prediction.)
3. "Tell your partner one thing we keep the same." (Pots, seeds, cotton wool, room, amount of water.)

Vocabulary

cress, test, change, keep the same, predict, light, dark, damp

Differentiation

- **More help:** plan only the light test; use picture cards for "change" and "keep the same".
- **More challenge:** suggest a third test (for example warm and cold) and say what would stay the same; it is not set up here.
- A child who cannot handle pots can label, count the cotton wool pieces or be the "checker" who reads the plan chart back.

⚠ Safety

- The adult holds the seed packet and sprinkles the seeds. Seeds never go in mouths, noses or ears.
- Nobody eats the cress grown in class.

- Wash hands after handling pots and cotton wool. Wipe up spills at once.

Teacher notes and misconceptions

- Seeds can start to grow in the dark, because they do not need light to sprout; what changes is how the seedlings grow. Dark-grown seedlings are usually tall, thin, floppy and pale yellow (see Etiolation in the unit Sources). Expect children to be surprised that the dark seeds grew at all.
- Some children think more water is always better. Four teaspoons a day keeps the cotton wool damp, not flooded.
- Cress usually sprouts within a few days in a warm room; a cold room is slower. Plant one or two spare pots of each kind in case some fail.
- Three pots for each choice is still a small test, not proof. The dark box may also be a little warmer or cooler than the windowsill.

Lesson 4: Seeds that hitch a ride

Unit overview - Previous: Planning a fair plant test - Next: Pollen helpers and our results

Back to the grade 2 year plan

Goal

Children learn three ways animals help seeds get to new places, then build model seeds and test which ones a "fur coat" carries across the room, so that their model works like an animal carrying a seed.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5.

Materials

- Three seed picture cards (the author's own pictures):
  - **Card A:** a burr with tiny hooks caught in a dog's fur.
  - **Card B:** a blackbird eating a berry; a small picture beside it of a seed on the ground far away.
  - **Card C:** a squirrel burying an acorn; a small picture beside it of a young oak growing in the same spot later.
- For each group of 4-5: twelve paper balls about 2 cm across (scrunched scrap paper, the "seeds"), seven short strips of the hook side of a hook-and-loop fastener, eight short pipe cleaner pieces (about 4 cm, cut by an adult, with the cut ends folded over), masking tape and a shallow tray. That is enough for three hook strip seeds, three pipe cleaner seeds, three seeds of the group's own design and one improved seed.
- One fake-fur mitten or a fluffy sock for the adult's hand (the "fur coat").
- A "new field" mat (a sheet or a hoop) about 3 m from the trays.
- A class results chart with four rows: "plain", "hook strip", "pipe cleaner hooks", "our own idea".
- One real hook-and-loop fastener to pass round.
- For blind or low-vision children: a burr-like fastener strip and a piece of fake fur to feel; their own seed models to feel before and after the test.

Steps

✎ Opening (5 min)

Quick look at the cress pots (2 minutes): "Has anything happened yet?" Do not explain the results yet.

Then: "Plants cannot walk. So how do their seeds get to a new place where there is room to grow?" Show the three cards and read them:

- Card A: "Some seeds have tiny **hooks**. They catch on an animal's fur. When the animal walks away, the seed goes too, and later it falls off."

- Card B: "Some seeds are inside fruit. A bird or another animal eats the fruit, and the seed drops out somewhere else."
- Card C: "Some animals, like squirrels, hide nuts to eat later. If they forget one, it can grow into a new tree."

✎ Main activity (25 min)

- **Make the seeds (8 min).** Each group makes three of each kind on its tray: three plain paper balls; three with a hook strip taped round them; three with pipe cleaner pieces taped on and bent into hooks; and three of their own design using the same materials.
- **Test (12 min).** The adult with the "fur coat" visits each tray in turn and does the same thing every time: brushes the fur once, gently, across the tray; walks to the "new field" mat; and gives one gentle shake over it. The group counts how many of each kind landed on the mat, and how many are still stuck to the fur (the adult picks those off over the mat and they count as carried). Record on the results chart.
- **Improve (5 min).** Groups change one of their plain seeds to make it stick better, and the adult tests it once more.

Pass round the real hook-and-loop fastener: "About 85 years ago, a man called George de Mestral looked closely at burrs stuck to his clothes and his dog's fur. He saw tiny hooks and used the idea to make this fastener."

✓ Discussion questions (5 min, with answers)

- "Which seeds did the fur carry best?" (Usually the hook strip or pipe cleaner seeds.) "Why?" (The hooks catch on the fur.)
- "Which seeds stayed behind?" (Usually the plain ones.) "What does a plant get from a seed that travels?" (A new place to grow, with room and light.)
- "What did we keep the same in our test?" (One brush, the same mitten, the same walk, one shake.)
- "How is our model like a real animal? How is it different?" (Like: the fur carries hooked seeds to a new place. Different: a real animal walks further, and the seed falls off at a time we cannot choose.)

✓ Closing check (5 min, with answers)

1. Hold up a plain seed and a hook seed. "Which would a dog carry?" (The hook seed.)
2. "Name one other way an animal helps a seed get somewhere new." (Eats the fruit and the seed drops out somewhere else; hides a nut and forgets it.)
3. "What gave someone the idea for this fastener?" (Burrs with hooks.)

Vocabulary

seed, hook, fur, burr, carry, model, new place

Differentiation

- **More help:** test only plain and hook strip seeds; count with counters.
- **More challenge:** draw and label a design for a seed that a bird would carry inside a fruit, or one that sticks to feathers.
- Children with weak hand grip can direct a partner who taps the hooks on.

⚠ Safety

- No real burrs, nuts or acorns in class (nut allergies and choking).
- Paper balls, fastener strips and pipe cleaners stay on the table; pipe cleaner ends are folded over by an adult.
- The fur mitten is fake fur, worn only by the adult; check for children who dislike the feel of fur and let them watch instead.

Teacher notes and misconceptions

- "Seeds only travel by wind" is a common idea. This lesson adds animals; wind and water were covered in the grade 2 literacy fact page "How Seeds Get About".
- Children may think animals carry seeds on purpose. The dog does not mean to carry the burr; the squirrel means to eat the nut later.
- The "85 years ago" is rounded from 1941 (see the unit Sources); say "a long time ago" if your class has not met large numbers.
- The model test is one comparison on one day, not proof. Fur, speed and how hard the adult shakes all change the results, so the adult keeps those the same.

Lesson 5: Pollen helpers and our results

Unit overview - Previous: Seeds that hitch a ride

Back to the grade 2 year plan

Goal

Children look at the results of the cress tests and say what cress needs, then use a model bee to show how an animal carries pollen from one flower to another.

Length

About 40 minutes: Opening 5, Main activity 25, Discussion 5, Closing check 5. Teach this lesson at least five school days after lesson 3.

Materials

- The twelve cress pots from lesson 3 (and any spares), a ruler, the plan chart and the prediction chart.
- For each group of 4-5: two paper flowers, each a paper plate with a paper cup centre. One has a yellow washable ink pad in its cup (the "pollen flower"); the other has a plain white paper circle in its cup.
- One cotton-wool "bee" on a lolly stick per child (or one per pair).
- Aprons and wipes.
- The end-of-unit check cards (see Assessment in the unit overview).
- For blind or low-vision children: the cress pots to touch gently (dry cotton wool, soft green shoots, floppy pale shoots); the ink "pollen" can be felt as slightly damp on the white paper.

Steps

✎ Opening (5 min)

Bring out all twelve pots and the dark box. Open the box last, so everyone sees the dark cress at the same moment. "Look at the plan chart. What did we change? What did we keep the same?"

✎ Main activity (25 min)

- **Our results (10 min).** Compare the sets, three pots at a time:
  - Light and dark: "What colour is each set? Which is taller? Which is stronger?" (The light set is usually green and upright; the dark set usually pale yellow, taller, thin and floppy.) An adult measures the tallest shoot in one pot of each set with the ruler.
  - Water and no water: "Did the dry seeds grow?" (Usually not; they look the same as on the first day.)
  - Fill in "We saw..." on the prediction chart. "Did all three pots in a set do the same? If one was different, what might have happened?"

- **Bee helpers (15 min).** Read: "Flowers make a fine dust called **pollen**. Bees and other animals visit flowers for food, and pollen sticks to their bodies. When they visit the next flower, some pollen rubs off. Pollen moving from flower to flower helps many plants make seeds." Each child makes their bee "visit" the pollen flower (dab the cotton wool on the ink pad), then "fly" to the white flower and land on it. Look: the yellow has moved. Groups try three more visits and count how many yellow marks the white flower gets.

✓ Discussion questions (5 min, with answers)

- "What does cress need to grow green and strong?" (Light.) "To start growing?" (Water.) "How do we know?" (Our results: the dark cress was pale and floppy; the dry seeds did not grow.)
- "Why was it a good idea to change only one thing in each test?" (So we know what made the difference.)
- "What did the bee carry? Where from, and where to?" (Pollen, from one flower to another.)
- "How is our bee like a real bee? How is it different?" (Like: pollen sticks to it and rubs off on the next flower. Different: a real bee is looking for food and visits many flowers; real pollen is dust, not ink.)

✓ Closing check (5 min, with answers)

1. "Tell your partner one thing cress needs, and how we know." (Light or water, with a result.)
2. "Show me with your bee how a bee helps a flower." (From the pollen flower to the white flower.)
3. "Name one way an animal helps a seed and one way an animal helps a flower." (Carries a seed on its fur, or eats fruit, or hides a nut; carries pollen.)

Then begin the one-to-one checks (see Assessment in the unit overview).

Vocabulary

result, pale, upright, floppy, pollen, flower, bee, carry

Differentiation

- **More help:** compare only light and dark; an adult guides the bee's hand movement if needed.
- **More challenge:** add a third flower with a blue ink pad, and see which colours end up where after several bee visits.
- A child who cannot hold a lolly stick can use a cotton-wool mitten or point to where the bee should go while a partner moves it.

⚠ Safety

- Washable, non-toxic ink only; aprons on; wipe hands before touching the cress pots.
- Nobody eats the cress. Afterwards the adult disposes of it, or lets it grow on as a class plant.
- Check for pollen allergies if you bring in real flowers; this lesson uses paper flowers only.

Teacher notes and misconceptions

- Children may say plants "eat soil". Our cress grew on cotton wool with only water and light, which is a good talking point (they still use stored food from the seed at first).
- Some children think bees visit flowers to help them. Bees visit for food; the pollen moving is a side effect that helps the plant.
- Pollen must reach the right part of the right kind of flower to make seeds. That detail is left for later grades.
- If the results do not match (for example a dark pot stayed short), talk about it honestly: "One pot was different. That is why we used three."