

Teacher Guide

Distinguishing Living/Biological, Natural Earth, and Human-Made Things • one day, 9:30–2:00

One-line goal: Everything in the whole world fits in just three boxes — living things, Earth things, and things people made — and people can never make anything out of nothing.

Structure note: kids come **one day a week**, so everything physical is staged the night before — the mixed tub, the labeled bins, the laminated Venn mat and card set, the scouted walk route. There are **no day-by-day child observation sheets** in this kit.

Prerequisites: A-1 (organizing into categories — today IS the master sort) · A-2 (air is real “stuff”).

KEY CONCEPTS (DON'T MISS THESE)

- **Three boxes hold the whole world:** living/biological · natural Earth · human-made. Ask “which box?” all day.
- **Biological** = alive NOW, once alive, part of a once-living thing, or made only by living things — shells, feathers, honey, and sugar all count.
- **Natural Earth** = never-alive things no person made — rocks, sand, clouds — and it **includes air and water**. Kids forget these; flag them all day.
- **Nothing from nothing:** every human-made thing starts from a **raw material** (a **resource**) out of the other two boxes — and many contain BOTH (a pencil = wood + graphite-clay + human shaping).
- **Recognizing a living thing on sight:** orientation (top/bottom, front/back), symmetry, fine repeating detail (veins, barbs, scales), a tenuous die-able quality — not by watching it grow.
- **Food stays biological even when processed** — cereal, bread, sugar. The famous exception: **salt**, a mineral.
- **Technology** = every step and all the thinking behind making something; **conservation** = taking care of the raw materials — there is nowhere else to get them.
- **Animals build** — nests, hives, dams — but this only mimics human technology; birds don't think up a better nest.
- **Stories vs. validated reality:** talking spoons live in books; the three boxes hold the real world.

VOCABULARY

Key terms: living · biological · natural Earth · human-made · raw material · resource · technology · conservation · symmetry · orientation

Copywork (binder sheet, printed): living · biological · natural · human-made

Kid-sized definitions to use all day: *living/biological* — alive, once alive, or made by living things · *natural Earth* — never alive, not made by people (even air and water) · *human-made* — people built it from a raw material · *raw material / resource* — the natural stuff a thing is made from · *technology* — all the steps and thinking to make something · *conservation* — taking care of raw materials · *symmetry* — two matching sides · *orientation* — a top and bottom, a front and back.

ACTIVITIES (KIDS DO)

1 • The Big Three-Box Sort

9:45 · 35 min · no card — run from this page · ONE pooled sort (“which box” circle + “bring-a-bag” merged)

Kids sit around the three labeled bins; the mixed tub — plus anything the kids collected — sits in the middle. Loop: each child draws ONE object, names it, says which bin and WHY, and places it; the group debates the borderline ones (wooden spoon, cereal, seashell, salt, glass marble). Ending: the tub is empty — then **count** how many landed in each bin and say which got the most and fewest.

Teacher key: wooden spoon → human-made (from a biological raw material) · seashell → biological (a sea animal built it) · salt → natural Earth (a mineral!) · cereal → biological (food stays biological, even processed) · glass marble → human-made (from natural sand) · feather, honey → biological · steel nail → human-made (from natural ore) · cotton shirt → human-made (from a biological plant) · plastic brick → human-made · and ask about the **air** and the **water** in the room → natural Earth.

Say: “Every single thing in the human-made bin started out in one of the other two bins. People shape things — people never make things from nothing.”

Failure modes: don’t rule on disputes too fast — the debate IS the lesson; ask “was it ever alive? did a person shape it?” and let the room converge. Keep the pencil OUT of the tub — it’s the Venn mat’s payoff case.

2 • Classification Walk

10:30 · 30 min · worksheet FRONT · clipboards + pencils · pre-scouted route

Walk the route slowly. Each kid hunts for **5 living**, **5 natural Earth**, **5 human-made** things and draws each find in its worksheet column — a quick scribble-sketch counts. Prompt at the pond or puddle and at a deep breath: “Which column do the water and the air go in?” (Natural Earth — draw a wavy line or a little cloud.) Back inside, compare charts: which column filled fastest?

Say: “Scientists carry their three boxes everywhere — in their heads. Once you know the boxes, you can’t stop sorting.”

Failure modes: pre-readers stall on “drawing it right” — scribbles count; the sorting is the science. Human-made stalls outdoors — point at the fence, the path, the house. Rain plan: sort through the windows, room by room.

3 • Three-Circle Venn Mat

11:00 · 25 min · laminated floor mat, teacher key printed on the back · a genuinely different kind of thinking: overlap, not buckets

The floor mat is printed and ready: **game-components/Three-Circle Sorting Mat.pdf** — three labelled overlapping circles with both the two-way overlaps and the centre all-three zone marked.

Lay the mat on the floor. Loop: each child picks one tricky object saved from the sort and reasons ALOUD where it belongs — wooden spoon, cotton shirt, paper → the **Biological** ∩ **Human-Made** overlap · glass marble → **Natural Earth** ∩ **Human-Made** · then the payoff: the wooden **pencil** (wood + graphite-and-clay + human shaping) → the **center all-three zone**. Ending: every tricky object placed and defended; check against the key on the mat’s back.

Say: “The spoon isn’t IN the biological circle or IN the human-made circle — it’s in the overlap, because both stories are true at once. That’s what overlap means.”

Failure modes: kids park objects in single circles out of habit — ask the two questions separately (“was it ever alive?” “did a person shape it?”) and watch the object slide into the overlap on its own.

EXPERIMENTS (CARDS PRINTED; KIDS PREDICT → HUNT/LOOK → EXPLAIN)

4 • Trace the Origin

11:25 · 35 min · card: [experiment-cards/01-trace-the-origin.pdf](#) · laminated matched card set

Deal each child ONE human-made object card (paper, glass bottle, steel nail, plastic toy); spread the raw-material cards face-up in the middle. Each child **predicts first**, out loud, then hunts for the matching source card (paper→tree · glass→sand · nail→iron ore · plastic→ancient buried life/oil). The group reveals pair by pair and walks each object back to its natural origin — proving “nothing from nothing.”

Say: “Paper was a tree. Glass was sand. The nail was a rock full of iron. The plastic toy was tiny living things buried for a very, very long time. People shaped every one of them — and people made NONE of them from nothing.”

Failure modes: plastic → oil is the hard pair — tell it as a story (“tiny sea creatures, buried, squeezed, for longer than you can imagine”) and accept wonder over mastery. Two kids chasing one card — let them argue, then check the pair backs.

5 • Magnification Detail Reveal

12:40 · 30 min · card: [experiment-cards/02-magnification-detail-reveal.pdf](#) · ONE magnification path, decided in prep

Cheap/on-hand path: a pocket magnifier held to the eye, object 1–3 inches away. **Rich path:** the USB digital magnifier already bought in another lesson, projected on the screen (do NOT re-buy it). Fixed procedure, narrated as one: lens/camera ready → object 1–3 inches → look for **fine repeating detail**. Each child runs it on a feather, a leaf, a seashell — then a plastic bead. **Surprising outcome:** the biological things explode into fine repeating detail; the plastic stays smooth and blank — the eye-test for “is it alive / was it alive,” made undeniable.

Say: “Living things are built from tiny parts, which are built from tinier parts — so the closer you look, the MORE you see. The bead was shaped in one go — so the closer you look, the less there is.”

Failure modes: pre-test the chosen magnification on the feather the night before — fumbling kills the reveal. Pocket-magnifier technique: lens to the EYE, bring the object toward it. Feather barbs “unzip” under little fingers — that’s a feature (the hooks ARE the fine structure); keep one pristine feather in reserve.

STRETCH (ranch, adult-run — not part of the core day):

- **The raw-materials museum shelf** (~\$30 of specimens): a standing display pairing each human-made thing with its origin — a glass pane over a jar of sand, a nail over a lump of iron ore, a cotton shirt over a cotton boll, a plank over a log. A semi-permanent “nothing from nothing” installation the kids add to all year.
- **Whole-property category scavenger hunt** with a printed checklist: find and photograph five living, five natural-Earth, and five human-made things — then argue the tricky ones (the barn wood, the pond, the fence wire) at dinner.

PROMPTS & QUESTIONS (USE ALL DAY)

- Hold up anything, anytime: “Which box? How do you know?”
- Was it ever alive? Did a person shape it? (The two questions that sort the world.)
- What is this made FROM? And THAT? Where does the trail end? (A raw material.)
- Which box do the air and the water go in? (Natural Earth — the two everyone forgets.)
- Is breakfast biological? Even cooked? Even as flour? The exception? (Salt — a mineral.)
- A bird builds a nest — is that technology? What’s different? (The thinking and passed-on know-how.)
- Could a person make wood? Sand? Iron? So why take care of forests and rivers? (Conservation.)
- In your storybook a spoon talks. Which shelf does that live on — the real world, or the story world?

WHAT TO WATCH FOR IN DAILY LIFE (SEND HOME)

- Sort the dinner table: “which box?” Argue the tricky ones — the arguing is the learning.
- Find something **once alive but not now** — a plank, a shoe, a fallen leaf. “What’s the clue?”
- Trace any made thing back — “what is it made from? and what was THAT made from?”
- A glass of water, a deep breath: “which box?” — keep air and water in natural Earth.
- Magnify anything at home — “fine repeating detail, or smooth and blank?”

PREP-AHEAD CHECKLIST (TEACHER-ONLY)

- ☐ **The week before:** ☐ TO-BUY arrived: bins (reused in B-3), pocket magnifiers (reused in B-4A), cardstock + lamination ☐ **print + laminate** the Venn floor mat (key on back) and the card set
- ☐ **The night before (L-1):** ☐ gather the **mixed tub**: wooden spoon, cotton shirt, glass marble, seashell, salt, cereal, plastic brick, feather, honey jar, steel nail (pencil held back for the Venn) ☐ label the bins: Living/Biological · Natural Earth · Human-Made ☐ **scout the walk route** ☐ **decide + pre-test the magnification path** on a feather and a bead (pocket magnifiers OR the owned USB magnifier — never buy a second) ☐ print sheets ×5 + cards ×1 if low
- ☐ **Morning of:** ☐ bins in a triangle, tub in the middle, spoon in its jar ☐ clipboards by the door ☐ Venn mat hidden until 11:00; cards staged for 11:25 ☐ feather, leaf, shell, bead + magnifiers on one tray

REVIEW HOOKS

- **Back:** A-1 (organizing into categories — today is the master sort) · A-2 (air is matter — why it earns its natural Earth place).
- **Forward:** B-3 reuses today’s bins and splits the living box into plants vs. animals. Later: D-thread rocks pick up natural Earth; technology and conservation return with every traced resource.

Opening Oration — The Trickiest Thing in the Kitchen

Distinguishing Living, Natural Earth, and Human-Made Things • read aloud, ~3 minutes

Prop: A plain **wooden spoon** — the classic tricky item: a biological raw material shaped by human hands. Keep it behind your back until the moment marked below, then hold it up and, later, pass it slowly around the circle. *(Pick a well-used one with visible wood grain — the lines in the handle carry the whole argument.)*

I am holding the trickiest object in this whole house. It fooled grown-up scientists for years. Are you ready to see it?

(Bring out the wooden spoon. Hold it up.)

A spoon. A plain wooden spoon. Don't laugh — by the end of this, you'll see why it's tricky.

Here is the game, and it's the same game real scientists play every single day: everything in the whole world — everything you have ever seen, or touched, or stepped on, or eaten — fits into just **three boxes**.

Box one: **living things** — and everything that ever WAS alive, or came from something alive. You. A fern. A beetle. A feather that fell off a bird. A seashell that a little sea animal built around itself.

Box two: **natural Earth things** — things that were never alive and that no person made. Rocks. Sand. Clouds. The water in the creek. Even the air you are breathing right this second — you can't see it, but it is real stuff, and it goes in box two. People always forget the air and the water!

Box three: **human-made things** — things people built. Cups. Cars. Nails. This house we're sitting in.

Three boxes. The whole world. So... where does my spoon go?

(Pass the spoon slowly around the circle.)

Is it alive? Feel it. No — it isn't breathing, it isn't growing, it will never have baby spoons. So — box two, with the rocks? Wait. Look closer. See those long thin lines running down the handle? That is **wood grain** — and only one thing in the world draws those lines. This

spoon was once **alive**. It was a tree, standing in the rain, drinking sunlight, for years and years. Then a person cut the wood and carved this shape.

So here is the secret the spoon was hiding: a person shaped it — but no person can **MAKE** wood. Nobody can. People can never make anything out of **nothing**. Every made thing in the whole world — every cup, every car, every nail — started out as something from box one or box two. A tree. A sand dune. A rock full of iron. That starting stuff has a name: a **raw material**. And that is why the raw materials of the Earth are worth taking care of — there is nowhere else to get them.

Today we are going to sort a whole mountain of things into the three boxes — and argue about the tricky ones. We'll walk outside and find all three boxes hiding in plain sight. We'll look at feathers and leaves through magnifiers and find the secret marks of living things. And we'll take made things and trace them back, step by step, to the tree or the sand or the rock they started as — because nothing... comes from nothing.

(Set the spoon standing in a jar in the middle of the table — it presides over the whole day, waiting for the sorting argument at 9:45.)

B-2 Supply List — Distinguishing Living, Natural Earth, and Human-Made Things

Everything for the full 9:30–2 day. The only real deadline: the Venn floor mat and trace-the-origin card set must be **printed and laminated before the night before** (see the Teacher Guide Prep-Ahead checklist).

ALREADY HAVE (TYPICAL HOUSEHOLD)

☐	ITEM	USED IN
☐	A plain wooden spoon (visible wood grain)	Oration prop • Big Sort • Venn mat
☐	A wooden pencil (wood + graphite — the "all three" case)	Venn mat center • worksheet BACK
☐	Cotton shirt (or any cotton garment)	Big Sort • Venn mat
☐	Glass marble	Big Sort • Venn mat • worksheet BACK
☐	Seashell	Big Sort • magnification (Card 2)
☐	Salt (a spoonful in a dish)	Big Sort — the mineral exception
☐	Dry cereal (a handful in a cup)	Big Sort — processed food stays biological
☐	Plastic brick or small plastic toy	Big Sort
☐	Feather (plus one pristine spare)	Big Sort • magnification (Card 2)
☐	Honey jar	Big Sort — an exclusive product of living things
☐	Steel nail	Big Sort • trace-the-origin talk
☐	A fresh leaf (picked on the day)	Magnification (Card 2)
☐	Plastic bead or smooth plastic toy	Magnification (Card 2) — the smooth-and-blank contrast
☐	A big tub or basket (holds the whole mixed sort)	Big Sort
☐	Clipboards + pencils, one per kid	Classification Walk (worksheet FRONT)
☐	Painter's tape + marker (bin labels)	Big Sort bins
☐	USB digital magnifier — already owned from another lesson	Card 2 rich path — do NOT re-buy

TO BUY

☐	ITEM	QTY	~PRICE	WHY	ORDER AHEAD?
☐	Three sorting bins or floor hoops, labelable	3	\$15	The Big Sort — REUSED in B-3's two sorting games; buy once here	Yes — needed on the day
☐	Pocket magnifiers	5 (1 per kid)	\$10	Card 2 on-hand path — REUSED in B-4A for vein/feather detail	Yes — needed on the day
☐	Cardstock + lamination pouches	1 pack each	\$8	The generated trace-the-origin card set + the three-circle Venn floor mat	YES — print + laminate before L-1

Total new spend: ~\$33.

CHECK-YOU-OWN-IT NOTES

- **Magnification:** the detail-reveal experiment also works with the **USB digital

magnifier already purchased in another lesson** — do NOT buy a second magnifier. The pocket magnifiers above are the free/on-hand fallback and the per-kid path; decide which path you'll run during prep and pre-test it on a feather and a bead.

- **Bins:** anything sortable-into works (laundry baskets, hula hoops on the floor) —

the labels matter more than the containers. But the bought set is reused in B-3.

- **The tub:** raid the kitchen and the toy shelf the night before; the Teacher

Guide's tub list is the proven mix of easy wins and honest arguments.

STRETCH PURCHASES (ONLY IF PURSUING THE RANCH INSTALLS — SEE TEACHER GUIDE STRETCH)

☐	ITEM	~PRICE	FOR
☐	Museum-shelf specimens (jar of sand, iron ore lump, cotton boll, small log/plank)	~\$30	The raw-materials museum shelf — each human-made thing displayed over its origin, added to all year
☐	(Printer + household camera assumed owned)	—	The whole-property scavenger hunt checklist — five finds per category, tricky ones argued at dinner

Tick the box beside each item as it goes in the box. Anything flagged **order ahead** ships — buy it a week before the lesson.