

GAMES & ACTIVITIES (FULL INSTRUCTIONS)

Energy Card Match — the backbone game

Pieces: 4 title cards (HEAT · LIGHT · ELECTRICITY · MOVEMENT) + 20 action cards (game-components, printed and laminated). **LOOP:** action cards face-down in the middle; each child flips one, names it, deals it to the form that makes it go, and defends the call; the group may challenge. **ENDING:** deck exhausted. Then the overlap hunt: find every card that belongs under TWO titles at once (candle → heat AND light; toaster → heat and light) and lay it straddling the piles — say the word **overlap** aloud. **WIN/PAYOFF:** the children discover that only FOUR forms power everything. **Little:** match picture to medallion. **Older:** defend the both-cards. **TEACHER KEY** printed on the back of each title card.

“Does It Go By Magic?” — judgment circle

Semicircle. Teacher holds up a real object or names a storybook event (“the toaster pops” / “the wand lights the room”). Each child calls **REAL** or **MAGIC** — and if **REAL** must name the form of energy and where it comes from. Run ~12 calls, mixing appliances with spells. Key: magic is make-believe; every real go traces to heat/light/electricity/movement arriving from a real source.

Trace-the-Wire hunt + SAFETY

Follow a lamp’s cord to its plug, the plug toward the breaker box, then step outside and spot the line coming to the house: **the switch is only a gate** — the energy arrives by wire from somewhere. **SAFETY, verbatim:** there is electrical power behind every plug and socket; it can burn and even kill; fingers and objects NEVER go into a plug or socket; hands away from electrical lines and boxes.

Energy-changes-form demo bench

Four stations, each child makes one go, says “___ turned into ___” aloud, then makes it STOP and says what ran out: solar car (light→movement — shade the panel with a hand), wind-up toy (stored→movement), hand-crank flashlight (movement→light — dims the instant cranking stops), the owned hot-cup Stirling engine (heat→movement). Line all four up at the end: *something was spent every time*.

THE “DOWNHILL” Q&A (CLOSING DISCUSSION)

Ask, with Think Time: *Do you ever see room-temperature cocoa heat itself up? Light from the room flowing INTO a lamp and the room going dark? A dead battery charging itself?* Guide to the rule: energy always travels from more toward less — hot→cold, bright→dark, charged→drained. Invite counterexamples; every one dissolves on inspection (the downhill ball is pulled by gravity). Close: every conversion sheds some heat, heat drifts toward cooler places and finally to space — so the world always needs fresh energy. Where from? That is C-3’s secret: the sun.

COMMON MISCONCEPTIONS (FROM THE BOOK, KEEP AT HAND)

- “The switch makes it go” → the switch is a tap on a wire; no electricity behind it, no go.
- “The stove cooks” → the HEAT cooks; the stove converts electricity or gas to heat.
- “It takes batteries” → batteries are bottles for energy; that is why they go dead.
- “The toaster turns electricity into toast” → back up one step: electricity→heat, and the heat toasts.
- Energy vs force: force is the strength of a push or pull — mention once, park it for C-3A.

REVIEW HOOKS

- Science notebooks: the four forms + one observation proving a conversion (no paper-fold books in this kit).
- Every car ride this week: “what form of energy is making THIS go, and where did it come from?”
- Cartoon audit (book’s To-Parents): could that really happen? What would happen instead, and why?

PREP-AHEAD CHECKLIST (NIGHT BEFORE)

☐ print + laminate the energy card set ☐ wind the wind-up toys; pocket one for the oration ☐ candles, long-reach lighter, snuffer, metal tray staged out of reach (A-7 kit) ☐ test the lamp + darkenable room ☐ thermos filled with near-boiling water just before session; metal mug, spoon, cold butter standing by ☐ aerogel tile on its tray ☐ solar car + tissue + floor tape + timer at the sunny lane ☐ coins counted, one per child

Opening Oration — Nothing Goes by Magic

read aloud, 2–3 minutes • keep the wind-up toy hidden in a pocket until its moment

PROP: a wind-up toy — wound tight before you begin. Hold it still and silent through the first half; release it mid-sentence where marked.

“I want to tell you about the most honest rule in the whole universe. It is this: **nothing goes by itself**. Nothing. Not one thing.”

“In stories, a wand waves and a feather floats across the room. A broomstick flies. A castle lights itself. Have you ever tried it? Point at something right now — go on, point hard — and tell it to move.” (*Let them try. Nothing moves.*)

“Nothing happened. And nothing ever will — because in the real world, every single thing that moves, or glows, or warms up, got its go from somewhere. That go has a name. It is called **energy**.”

“There are only four kinds of go in all the world. **Heat** — the warm kind. **Light** — the bright kind. **Electricity** — the kind that travels through wires. And **movement** — the go itself. Four. That’s the whole list. Every machine, every fire, every sunbeam, every bouncing ball runs on one of those four.”

“But here is my favorite part. Energy can **hide**. It can curl up inside things and wait — inside a battery, inside a candle, inside your breakfast, and inside...” (*bring out the wound toy, hold it dead still*) “...this. Watch. My arm wound this spring up tight this morning. My movement went INTO it, and it has been waiting in there, all this time, for me to...” (*release it — let it clatter across the floor*) “...let it out!”

“Today we are going to catch energy doing everything it does: changing from one kind into another, hiding and coming out, and always, always arriving from somewhere real. And when anyone asks you how the lamp knows to light — you will be able to follow the wire and tell them.”

C-1 Supply List — Concepts of Energy I: Making Things Go

Everything for the full 9:30–2 day. Prices are rough. **Order-ahead flags matter:** the solar car, crank flashlight and pull-back/wind-up set all ship — allow a week. This lesson's purchases are the backbone of the whole C thread — nearly everything here is reused in C-2 through C-7.

ALREADY HAVE (TYPICAL HOUSEHOLD / PRIOR KITS)

☐	ITEM	USED IN
☐	Long-reach lighter + snuffer + metal tray (A-7 kit)	Candle demo (Card 5)
☐	The hot-cup Stirling engine (owned)	Demo bench — heat→movement
☐	The silica aerogel tile (owned)	Card 4 — conduction by refusal
☐	0.1g digital scale (A-8/A-9 kit)	(not needed today; C-3 will use it)
☐	A lamp on a cord + a darkenable room	Light-flows demo, Trace-the-Wire
☐	Thermos, metal mug, metal spoon, butter	Card 3 — three ways heat moves
☐	Coins (one per child)	Card 1 — movement makes heat
☐	Tissue paper, floor tape, 5-second timer	Card 2 — solar car fair test
☐	A basket of small appliances/objects to pass	"Does It Go By Magic?" circle

TO BUY

☐	ITEM	QTY	~PRICE	WHY	ORDER AHEAD?
☐	Solar toy car	1	\$10	Card 2's fair test — light→movement you can race; returns in Thread D for sunlight work	YES — ships
☐	Hand-crank flashlight	1	\$12	Demo bench — movement→light, dims when you stop; returns in C-6	YES — ships
☐	Pull-back cars + wind-up toys set	1 set	\$15	Stored-energy props; oration prop; reused in C-3's free-play stations	YES — ships

☐	ITEM	QTY	~PRICE	WHY	ORDER AHEAD?
☐	Rubber-band assortment	1 bag	\$5	Bought ONCE here; reused in C-2 pluck lab, C-3 free play, C-4 weigh-the-band	Yes
☐	Birthday candles	1 box	\$3	Card 5 — wax is a fuel	No
☐	Cardstock + lamination for the energy card set	—	\$5	The backbone game (print files in game-components/)	No

Total new spend: ~\$50 — and five of the six purchases are reused across at least one later lesson.

CHECK-YOU-OWN-IT NOTES

- **Do NOT buy a Stirling engine** — the household hot-cup one is exactly right; it runs on a mug of hot water at the demo bench.
- **Do NOT buy aerogel if a tile is owned** — buy the plain silica tile (~\$25) only if starting from nothing; never the powder or beads.
- The wind-up toy for the oration pocket comes out of the pull-back/wind-up set — no separate buy.

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