Energy on the Move

Teacher		**Class**	Grade 4
Subject	Science	**Topic**	Energy transfer
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn sound, light, heat, and electric current carry energy. They observe transfers and draw the path energy takes.

Curriculum links

- Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. [1]

Learning objectives

- Students will observe that sound, light, heat, and current transfer energy place to place.
- Students will use observations as evidence to explain where energy started and ended.

Success criteria

- I can name the four ways energy moves and give an example.
- I can describe what I observed to prove energy moved place to place.
- I can draw arrows to show energy path from source to receiver.

What students already know

Show thumbs up if you have heard a drum, seen a flashlight spot, felt a warm cup, or lit a bulb. Ask: What changed at the other end?

Key words

energy	power that can make things move, warm up, or glow
transfer	movement of something from one place to another place [20]
sound	what ears hear when air shakes and makes things shake [11]
light	brightness that lets eyes see and can warm skin
heat	warmth that moves from a warmer thing to a cooler thing [6]
electric current	moving power in wires that can light a bulb [18][4]

Materials

- Slides 1–11 and projector
- Video clip 1 Energy transfer overview (0:00–2:27) on slide 5
- Paper folded into four boxes, one per student, plus spare pre-drawn panels
- Crayons, pencils

Before the lesson

- Print paper folded into four boxes for Comic Strip Energy Trip, plus 4–5 pre-drawn sets with start and end already drawn
- Print Worksheet Task G Matching for exit check
- Test Video clip 1 (0:00–2:27) on slide 5 with sound and captions

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- Hand drum, tissue paper, flashlight, white paper taped to wall
- Plastic cups, warm tap water about 100°F, metal spoon, paper towels
- AA batteries in holders, small bulbs in holders, wires with clips
- Worksheet Task G Matching, one copy per student
- Set up demo table: drum with tissue, flashlight and white paper 6 feet away, cup of warm tap water about 100°F with spoon, battery-bulb loop
- Tape two floor marks 6 feet from wall for flashlight spot and 3 feet line for sound test

Lesson outline

0–8 min **Starter** 8 min · Whole class

Activate everyday experiences of energy movement and hook interest in seeing the unseen.

YOU DO

1. Show Slide 1 and read title: Sound, light, heat and electricity carry energy.
2. Use the hook: If you had super glasses that let you see energy moving, what would you see? Take 3 quick ideas.
3. Show Slide 2 and read: Where did energy move for you this morning? Let students vote: I heard sounds, I saw lights, I felt warmth, I used power in wires.
4. Chart 2–3 examples under claim and evidence to model later talk.

STUDENTS DO

1. Vote by raising hands for heard sounds, saw lights, felt warmth, used power in wires.
2. Tell a neighbor one morning example and where the energy seemed to arrive.
3. Share 2–3 ideas whole class.

Say: If you had super glasses that let you see energy moving, what would you see? Think about this morning. Where did energy move for you this morning? Turn and tell your neighbor one spot where something moved, lit up, or warmed.

Ask: If you cannot see sound, how do you know it traveled across the room to you? (We hear it with our ears and see things shake or vibrate.) · Can light leave a flashlight, travel across our room, and still do something there? (Yes, we see a bright spot where the light lands.)

Check understanding: Fists to five: how sure are you energy moved this morning? If many show 1–2, take one more example of hearing a drum across the room.

Support: Offer sentence starter: This morning I observed ___. That tells me energy moved. **Stretch:** Ask: What would change the observation, like moving farther from the sound or blocking the light?

Use: Slides 1–2

8–20 min **Teaching** 12 min · Whole class

Explain the four movers and model how to trace energy from start to end.

YOU DO

1. Show Slide 3 Four energy movers and point to each card: sound shakes, light shines, heat warms, electricity flows.
2. Show Slide 4 Sound vs. Light and read key lines with class.
3. Play Video clip 1 (0:00–2:27) on Slide 5: Watch how sound, light, heat move. Tell students to spot what changes at the end.
4. Model one traced example on board: flashlight to wall with arrow.

STUDENTS DO

1. Read Slide 3 cards with teacher and mime shake, shine, warm, flow.
2. Watch video and whisper to partner one change seen at the end.
3. Copy the flashlight arrow from start to end in the air.

Say: Energy is power that makes things happen. Motion energy, heat energy, sound energy and light energy can all be transferred from place to place [18]. Sound is also a form of energy that travels [11]. Electricity can transfer energy from place to place [18]. We will watch where energy starts and ends and look for proof.

Worked example: Flashlight to wall, 6 feet away: Step 1 start - energy in battery moves through wires to bulb. Step 2 travel - light leaves bulb and crosses room. Step 3 end - bright spot appears on white paper. Proof: spot appears when unblocked and disappears when blocked, so light carried energy to the paper.

Ask: Where did energy start and end when the flashlight lit the wall? (Started at flashlight/battery, ended at bright spot on wall.) · What is your proof energy moved and did not just stay in the flashlight? (We observed the bright spot appear far away, then disappear when blocked.) · How is heat movement like that? (Heat is energy which is transferred from warmer objects to cooler objects [6], so a warm cup warms cold hands.)

Check understanding: Mini whiteboards: draw arrow from flashlight to wall and label light. Scan; reteach start-end if arrows are backwards.

Support: Keep Slide 3 cards visible and point to picture hint while replaying 20 seconds of video muted.
Stretch: Ask to predict what happens to the spot when we move 3 feet closer and 3 feet farther.

Use: Slides 3–5, Video clip 1 (0:00–2:27)

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20–35 min **Guided observation** 15 min · Whole class

Make shared observations of all four transfers to use as evidence.

YOU DO

1. Show Slide 6 mindmap: energy moves, sound shakes things, light shines far, heat warms cooler things, electricity flows in wires.
2. Demo 1 sound: tap drum near tissue. Demo 2 light: shine flashlight at paper 6 feet away, block then unblock. Narrate start to end.
3. Demo 3 heat: hold warm cup and show metal spoon in warm tap water about 100°F, touch handle after 1 minute. Demo 4 electric current: close battery-bulb loop to light, then open one wire.
4. Show Slide 9 photo and read: Lightning flashes bright, booms loud, and warms the air. Ask which movers are shown.

STUDENTS DO

1. Observe each demo and call out what moved, lit, or warmed at the end.
2. Choral frame: I know energy moved because I observed ___ for each demo.
3. Turn to partner and name start and end for heat and electric current demos.

Say: Watch closely and tell me your proof. I know energy moved because I observed ___. Heat will flow from the hotter object to the colder one [13]. Electrical energy can be transferred from a power source to various components through electrical circuits or connections [4]. Sound energy makes objects vibrate too [20].

Worked example: Sound demo step by step: I tap drum here. You observe tissue shaking 3 feet away. No one touched the tissue. Claim: sound moved energy. Evidence: tissue shook more with loud tap than soft tap, so energy traveled by sound from drum to tissue.

Ask: When the bulb lit, how did energy get from battery to bulb in different places? (Electric current carried energy around the loop through wires to the bulb [4].) · When the spoon handle felt warmer, where did the warmth come from? (Thermal energy moved by coming in direct contact with warm water [6].)

Check understanding: Cold call one student per transfer to state start, end, and observation. If heat is confused, touch cup again and restate warmer to cooler.

Support: Focus student on metal spoon only first, since metal shows conduction fast when molecules touching transfer warmth [14]. **Stretch:** Ask to compare soft shake and loud shake from 3 feet away and record which moves tissue more.

Use: Slides 6, 9

35–52 min **Main activity** 17 min · On their own

Draw and label how energy travels from source to receiver for each mover.

YOU DO

1. Show Slide 8 and read: Visit 4 spots and watch what moves, lights, or warms. Make sound shake tissue, shine light, feel warmth, light bulb. Draw or write what changed.
2. Hand out paper folded into four boxes, crayons, pencils. Model box 1: drum to ear with arrow labeled sound and note tissue shook.
3. Send students to draw boxes 2–4: flashlight to wall, warm pot to hand above it, battery to bulb, with arrows labeled light, heat, electric current and end observation.
4. Collect strips and have 2 students explain start, path, and proof.

STUDENTS DO

1. Draw four panels: drum to ear, flashlight to wall, warm pot to hand, battery to bulb.
2. Add arrows to show path and label each with sound, light, heat, or electric current.
3. Write or draw what changed at the end as proof.

Say: Now make your Comic Strip Energy Trip. You will draw how energy travels from a source to where it is received [20]. Draw an arrow to show the path in each box. Label sound, light, heat, or electric current and write what you would observe at the end.

Worked example: Box 1 done for you: Left - a student taps drum. Arrow labeled sound to right. Right - ear and shaking tissue. Caption: I observed tissue shake, so sound moved energy. Now you do the same pattern for light, heat, and electric current.

Ask: What must every arrow show? (Where energy started, which mover carried it, and where it arrived with proof.) · What is good proof for the heat panel? (Hand or spoon felt warmer because heat moved from warmer to cooler thing.)

Check understanding: Walk with checklist: four arrows, four labels, four end observations. If missing, point to Slide 6 mindmap for label words.

Support: Give panels with the start and end already drawn so the student only adds the arrow and one label.
Stretch: Add a second small panel showing what happens when the path is blocked, like turning off the flashlight or opening the circuit.

Use: Slide 8

52–60 min **Plenary** 8 min · Whole class

Share best evidence and check that all four transfers are understood.

YOU DO

1. Show Slide 10 and ask: What is your best proof that energy moved from place to place? Think, pair, share comic strips.
2. Do Worksheet Task G Matching: match each word to its meaning by writing the number in the circle.
3. Show Slide 11 Exit ticket: One energy transfer I saw today was... One thing I learned today... One question I still have... Collect on slips.

STUDENTS DO

1. Think, pair, share best proof using frame: My evidence is ___, so energy moved by ___.
2. Match each word to its meaning by writing the number in the circle for Task G.
3. Write exit ticket slips with one transfer seen, one learning, one question.

Say: Hold up your strip. Tell your partner: My evidence is ___, so energy moved by ___. Nearly all thermal energy on Earth comes from the sun and travels in the form of energy waves, such as light [14]. Now let us match words to meanings and finish your exit ticket.

Ask: What is your best proof energy moved by sound today? (Tissue shook / rice jumped when drum was tapped nearby with no touch.) · What proves electric current moved energy, not just the bulb alone? (Bulb lit only when loop was closed; opening the wire stopped it.)

Check understanding: Read 3 exit slips aloud. If labels mix light and heat, revisit lamp gives both light and heat example.

Support: Provide sentence starters: I observed ___. That tells me ___ moved. **Stretch:** Ask: What would you change to test farther distance or blocked path for your best proof?

Use: Slides 10–11, Worksheet Task G

Common mistakes

Mistake	How to spot it	How to fix it
Thinking energy disappears when bulb goes out or sound stops	Says energy is gone when circuit is opened or drum stops	Trace where it went: bulb cools, sound shook air and tissue. Energy transfer is movement from one place to another [20].
Mixing heat and temperature – cold moves into warm object	Says cold from ice moved into hand	Restate heat is transfer due to difference in temperature [13] and flows hotter to colder; cold feeling is warmth leaving hand [6].
Thinking light needs air to travel like sound does	Says light stops with no air	Compare: sound travels in waves through air and water, light can travel even with no air and warms from far; sun warmth traveled 93 million miles [20].

Support

- Use pre-made shaker, drum, and pre-drawn comic panels so focus is on watching rice jump and labeling arrow
- Keep floor marks for standing and aiming flashlight and color-dot sorting hints for sound, light, heat, current
- Give sentence frames: I know energy moved because I observed ___ and My evidence is ___

Stretch

- Compare soft and loud shakes from 3 feet away and test flashlight 3 feet closer and farther to describe spot change
- Add blocked-path panels and explain tricky lamp card where electrical energy becomes both light and heat
- Predict ice-water spoon test and second-bulb brightness change with where energy went

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For the LSE or teaching assistant

Stay near demo table and comic strip work. Prompt observation language, help aim flashlight, check warm water handling, and guide loop connection in order battery-wire-bulb.

Safety

- Do not shine the flashlight directly into eyes
- Use only warm tap water about 100°F, not hot water; ensure water is not hot enough to burn or scald [6]
- Use only AA batteries in holders; never use wall outlets, power strips, or anything that plugs in

Check for understanding

Question	Answer
Give one observation that proves sound transferred energy place to place.	Tissue shook / grains jumped when drum was tapped nearby without touching.
Give one observation that proves light or heat transferred energy.	Bright spot appeared on wall 6 feet away; spoon handle felt warmer in warm water.
How do you know electric current transferred energy to the bulb?	Bulb lit when loop was closed and went out when wire was opened.

Homework

Find one home example each for sound, light, heat, and current moving energy and sketch arrows.

Sources

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