

Energy Transfers & Transformations

Solar Sail Terrace with Zingling

Learning target

Trace energy through a simple device.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Transfers between objects; light to electricity; electricity to motion; heat outputs

Open Solar Sail Terrace - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Energy Transfers & Transformations - key ideas

1. The first clues

Energy transfers between objects and can change form in a system. A solar panel can convert light energy to electrical energy.

2. How the clues connect

An electric motor can produce motion, with sound and warming as additional outputs. Useful output is not necessarily the only output.

3. Our evidence record

Our diagram runs sunlight to panel to electric motor to turning wheel, with warming also recorded. Track the extra output rather than claiming all input becomes wheel motion.

Keep the science accurate

Use qualitative energy evidence; no kinetic/potential-energy equations. Energy is transferred, not simply destroyed when a device stops.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/4-ps3-energy>

Talk through the evidence

1. What input reaches the solar panel?

Expected answer: Light

Reasoning: Our diagram runs sunlight to panel to electric motor to turning wheel, with warming also recorded. Track the extra output rather than claiming all input becomes wheel motion.

2. What does the motor produce here?

Expected answer: Motion plus other outputs

Reasoning: An electric motor can produce motion, with sound and warming as additional outputs. Useful output is not necessarily the only output.

3. Which additional output is recorded?

Expected answer: Warming

Reasoning: An electric motor can produce motion, with sound and warming as additional outputs. Useful output is not necessarily the only output.

4. Which energy chain fits?

Expected answer: Light to electrical energy to motion

Reasoning: Our diagram runs sunlight to panel to electric motor to turning wheel, with warming also recorded. Track the extra output rather than claiming all input becomes wheel motion.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.