

Amplify Science



Harnessing Human Energy

@Home Unit

Family Overview

Your student is about to start a unit called *Harnessing Human Energy* in science class. We hope that the information here can help support you as you guide your student through their at-home science learning.

We are using a program called Amplify Science, which is split up into units about different areas of science. In each unit, students start by wondering about something that happens in the real world and they investigate, talk, read, write, think, and argue like real scientists and engineers in order to figure out how and why that thing happens.

In the *Harnessing Human Energy* unit, students learn about energy in order to figure out how rescue workers can power their flashlights and other devices when there's nowhere to plug them in. As they solve the rescue workers' problem, students get familiar with the practices of science, including the specific ways that scientists talk, read, collect and analyze evidence, and more. These practices will be important as students study science throughout the year, and beyond.

We are using a version of *Harnessing Human Energy* that is specially designed for at-home learning. It gives students many opportunities to consider different questions about energy, gather evidence to help them understand, then use that evidence to make an explanation. This means students will be doing activities that involve talking, writing, reading, and investigating.

In order to support your student, you can help them with understanding directions, writing about their ideas, and reading articles. Students are asked to do some activities with a partner, and you can be your student's partner as they talk over questions and ideas and practice scientific arguments.

In this unit, students are trying to figure out a new way for rescue workers to power their devices. You may wish to ask your student:

- “What did you figure out in your science lesson today?”
- “How does that help you understand more about the rescue workers’ energy problem?”

Answering these questions after every lesson can help students understand more deeply and keep them interested in learning more. To get more ideas for *Harnessing Human Energy*, you can go to the Amplify Family Resources website at amplify.com/amplify-science-family-resource-intro.

Resources for *Harnessing Human Energy*

Read on to find out more about *Harnessing Human Energy*. These pages will give you some background about what your student is learning and some ideas for how to support them.

What Is This Unit About?

In *Harnessing Human Energy*, students take on the role of energy scientists who are helping a team of rescue workers with an energy problem. Students work to find a way to get energy to the batteries in the rescue workers' electrical devices, even during power outages. First, students explore relationships between different types of energy and the ways energy is moved between things and changed from one form to another. To solve the rescue team's energy problem, students research various ways to capture and store energy.

What Questions Do Students Answer in This Unit?

To figure out how energy works, students investigate Chapter Questions, which help them build their scientific arguments along the way.



Chapter 1: What is energy and why does it matter to the rescue team?



Chapter 2: How can the rescue workers get energy to the batteries in their equipment during rescue missions?

What Science Ideas Do Students Figure Out?

To answer the Chapter Questions, students figure out the following key concepts as they investigate, read, write, and argue. Reading through these concepts may help you get more comfortable talking about the science ideas from *Harnessing Human Energy* with your student. Note that these are revealed throughout the unit and are not meant to be shown to students in advance.

Chapter 1 (@Home Lessons 1–4):

- Whenever something moves or changes, it is because of energy.
- When something is moving, it has kinetic energy.
- When something has the ability to make things move or change in the future, it has potential energy, even if it is not moving or changing now.

Chapter 2 (@Home Lessons 5–9):

- Nothing creates energy. If something has energy, the energy must have been transferred from something else.
- Energy can be transferred from one object to another, and energy can be converted from one type to another.

What Science Vocabulary Words Do Students Use?

These are the most important science words that students use throughout the unit. Getting familiar with these definitions, which are sometimes different from how people use these words in everyday life, may be useful as you support your student’s at-home learning. Your student will have a Glossary that includes these words.

- **claim:** a proposed answer to a question about the natural world
afirmación: una respuesta propuesta a una pregunta sobre el mundo natural
- **convert:** to change from one type to another
convertir: cambiar de un tipo a otro
- **energy:** the ability to make things move or change
energía: la capacidad de hacer que las cosas se muevan o cambien
- **evidence:** information about the natural world that is used to support or go against (refute) a claim
evidencia: información sobre el mundo natural que se utiliza para respaldar o rechazar (refutar) una afirmación
- **generator:** a machine that can convert kinetic energy into electrical energy
generador: una máquina que puede convertir energía cinética en energía eléctrica
- **kinetic energy:** the energy that an object has because it is moving
energía cinética: la energía que tiene un objeto porque se está moviendo
- **potential energy:** the energy that is stored in an object or system
energía potencial: la energía que está almacenada en un objeto o sistema
- **reasoning:** the process of making clear how your evidence supports your claim
razonamiento: el proceso de aclarar cómo tu evidencia respalda tu afirmación
- **system:** a set of interacting parts forming a complex whole
sistema: un conjunto de partes que interactúan formando un todo complejo

- **transfer:** to move from one object to another or one place to another
transferir: mover de un objeto a otro o de un lugar a otro

What Do Students Read?

Your student will read this article, which gives them a chance to learn about the science concepts in the unit through photos and real-world examples. Students are taught to read actively as real scientists do, adding their questions and ideas as they go, and reading the article a second time with a new focus.



Energy Inventions

What Supplies Will Students Need in *Harnessing Human Energy*?

This unit does not require the use of any additional materials, though students should have paper and a pen or pencil available.