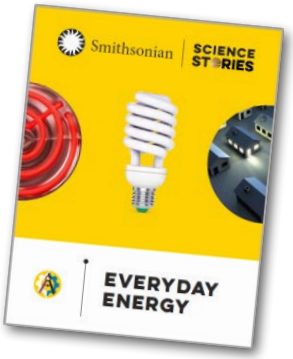
Smithsonian SCIENCE STORIES

GRADE 4

EVERYDAY ENERGY

ENGINEERING DESIGN READER



READING 1

ENERGY AT HOME p.1

Discussion Questions:

1. How many devices can you find in your home that use energy?

2. What do you notice about the recent devices on the timeline, like televisions, computers, and smartphones?

READING 2

INSIDE A POWER PLANT p.9

Discussion Questions:

1. What similarities and differences do the two types of powerplants have?

2. What pros and cons can you think of for using water and coal to generate electricity in a power plant?

READING 3

REMARKABLE RESOURCES p.11

Discussion Question:

1. Which two resources would you choose to generate energy for a city or town? Why did you choose them?

READING

4

AT HOME WITH THE ROBOTS p.23

Discussion Questions:

1. What did engineers learn from using robots at the net-zero house?

2. What kinds of experiments could be designed using robots?

READING

5

ELECTRIFYING AMERICA p.27

Discussion Question:

1. What three things would you do if you lived in a time when you didn't have electricity?

READING

6

BETTER THAN MAGIC p.31

Discussion Questions:

1. What devices can you think of that have made people's lives easier?

2. What questions would you want to ask an engineer?

READING

7

TINKERING FOR TOMORROW p.35

Discussion Question:

1. What type of science or engineering project would you want to work on for over a year?

GRADE 4 ENGINEERING DESIGN: *Everyday Energy*

Smithsonian Science for the Classroom Module: *How Can We Provide Energy to People's Homes?*

"Energy at Home"

How many devices can you find in your home that use energy? (*Lights, oven, refrigerator, water heater, hair dryer, toaster, fans, remotes, TV*)

What do you notice about the recent devices on the timeline, like televisions, computers, and smartphones? (*They have screens; they are all used for communication and entertainment.*)

"Inside a Power Plant"

What similarities and differences do the two types of powerplants have? (*They both use water; they both have turbines; the coal plant needs to make more heat to produce energy.*)

What pros and cons can you think of for using water and coal to generate electricity in a power plant? (*Pros: A lot of people benefit from the energy produced. Cons: There needs to be a source of water nearby, people need to get coal from below the ground.*)

"Remarkable Resources"

Which two resources would you choose to generate energy for a city or town? Why did you choose them? (*Moving water and biomass because I think they would be the least expensive.*)

"At Home with the Robots"

What did engineers learn from using robots at the net-zero house? (*Robots helped engineers know the house's energy use successes and failures.*)

What kinds of experiments could be designed using robots? (*Robots could be used when it would be unsafe to experiment with people.*)

"Electrifying America"

What three things would you do if you lived in a time when you didn't have electricity? (*Make crafts, play musical instruments, sing or dance*)

"Better than Magic"

What devices can you think of that have made people's lives easier? (*cars, computers, home heating and cooling systems, elevators, washers, dryers, ovens, lights*)

What questions would you want to ask an engineer? (*What kinds of problems are you working to solve? What problems might need to be solved when I finish school? What is an accomplishment you are proud of? How did you know you wanted to be an engineer? What do you like about your work?*)

"Tinkering for Tomorrow"

What type of science or engineering project would you want to work on for over a year? (*Something that would help a sick person heal faster. Something that would help people in an emergency.*)