

Science

Energy

1. What is energy, where does it come from, energy conversion by plants.
2. Stored energy: types and state changes
3. Forms of energy
4. Properties of kinetic energy

Lesson 1

Introduction to Energy

Student Book, p9

What is energy? Ability to do work

Where does energy on Earth come from? Sun

How does this energy come to Earth? Light

What uses the Sun's energy to make food? plants

Show pic of chloroplast

Stored energy: 3 main kinds; energy has to change state to become usable

Student Book, p10 What are 3 MAIN kinds of stored energy? Batteries, fuel, food

Student Book, p11 What does a *battery* do? Stores and releases energy. Give an example of something that uses a battery? flashlight: show with and without battery. Do batteries wear out?

Student Book, p12 Give 3 examples of *fuel*. Give one example of something that you use fuel for/in. stove

Student Book, p13 Give 3 uses for *food*. Work, play, body temperature

Lesson 2

Forms of Energy

Student Book, p14 Give an example of energy change from one form to another.

Student Book, p15 Name all the kinds of energy you can think of: stored, chemical, motion, electrical, light, thermal (heat)

Properties of Kinetic Energy

Student Book, p16 What happens when a moving object hits an object at rest? Energy is transferred

Student Book, p17 What is friction? A moving object rubbing against another object changes some kinetic (energy of motion) into heat energy.

Begin with experiment with windup toys and timers in table groups. Have students tabulate how long a toy moves when wound. Change number of turns in winding. Compare numbers between table groups. End with same experiment. Have students describe the toy's behavior using what they have learned about energy.

Lesson 3

Wave forms: <http://www.kettering.edu/physics/drussell/Demos/waves/wavemotion.html>

Waves transmit energy

Waves in Water

Student Book, p18

15. What direction do waves travel in when they pass through water? The wave motion is up and down, perpendicular to the direction the wave is traveling in.
16. When a wave passes through water, does the water move? Up and down, but not forward. It ends up about where it started.
17. Do objects floating on water move when a wave passes through water? Up and down, but not forward. They end up about where they started.
18. What determines how big a water wave is? How much energy the wave carries

Waves in Air

19. What kind of wave carries sound? compression wave
20. Does something you hear have to touch you? No, you can hear distant objects.
21. What happens when a sound wave reaches your ear? It causes your eardrum to vibrate, which sends a signal to your brain along nerves in your ear.

Waves in the Earth

22. When part of the Earth's surface moves, what direction does the energy move in? All directions
23. What happens to the ground during an earthquake? It vibrates.
24. What kinds of waves does an earthquake cause? 3 kinds: up and down (like water), forward and back (like air), and side to side.
25. Where do we get electricity? power plant
26. How is electricity made? change energy from some other form into electricity
27. How do we send electricity from place to place? electrical wires/transmission wires
28. What happens to electricity when it reaches your home? It is changed into other useful forms, such as heat, light, sound.
29. Name 5 sources of energy that can be turned into electricity. Moving water, burning coal/natural gas, nuclear reactors, sunlight, wind

Science

Energy

Study Questions

1. What is energy? Where does it come from? What do plants do with the Sun's energy?
2. What is stored energy? What types of stored energy are there? How do we use them?
3. What are the different forms of energy?
4. What is the energy of movement? What is friction? What happens when a moving object hits an object that is still?
5. What are the 2 types of waves? What is the motion of a wave in water? In air? In earth? When waves pass through matter, does the matter move?

Lesson 1

Introduction to Energy

Student Book, p9

1. What is energy? _____

2. Where does energy on Earth come from? _____

3. How does this energy come to Earth? _____

4. What uses the Sun's energy to make food? _____

Stored energy

Student Book, p10

What are 3 MAIN kinds of stored energy? _____

Student Book, p11

5. What does a *battery* do? _____

6. Give an example of something that uses a battery. _____

Student Book, p12

7. Give 3 examples of *fuel*. _____

8. Give one example of something that you use fuel for. _____

Student Book, p13

9. Give 3 uses for *food*. _____

Lesson 2

Forms of Energy

Student Book, p14

10. Give an example of energy change from one form to another. _____

Student Book, p15

11. Name all the forms of energy you can think of, and give a brief description or an example.

a) _____

b) _____

c) _____

d) _____

e) _____

f) _____

g) _____

Properties of Kinetic Energy

Student Book, p16

12. What happens when a moving object hits an object at rest? _____

13. Does the total amount of energy change when a moving object hits an object at rest? _____

Student Book, p17

14. What is friction? _____

Lesson 3

Waves transmit energy

Waves in Water

Student Book, p18

15. What direction do waves travel in when they pass through water? _____

16. When a wave passes through water, does the water move? _____

17. Do objects floating on water move when a wave passes through water? _____

18. What determines how big a water wave is? _____

Draw a picture of a wave traveling through water.

Waves in Air

19. What kind of wave carries sound? _____

20. Does something you hear have to touch you? _____

21. What happens when a sound wave reaches your ear? _____

Draw a picture of a sound wave.

Waves in the Earth

22. When part of the Earth's surface moves, what direction does the energy move in? _____

23. What happens to the ground during an earthquake? _____

24. What kinds of waves does an earthquake cause? _____

Lesson 4

Electricity

Waves in Water

Student Book, p18-19

25. Where do we get electricity? _____

26. How is electricity made? _____

27. How do we send electricity from place to place? _____

28. What happens to electricity when it reaches your home? _____

29. Name 5 sources of energy that can be turned into electricity. _____

Draw a picture showing how electricity comes to your home, and what happens when it gets there.

(Hint: source, transmission, destination)