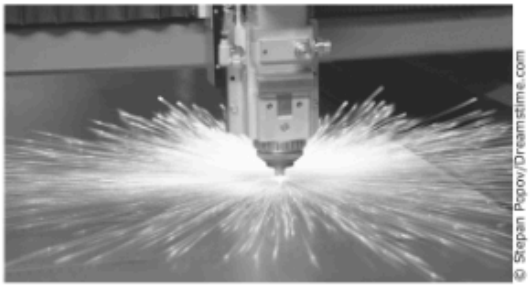
14 The photograph shows a laser cutting a sheet of metal as the laser moves from one end of the metal to the other.



Four groups of students each made a table of examples of the different types of energy involved in this process. Which of these tables is correct?

F

Type of Energy	Example
Mechanical	The laser moves across the metal.
Thermal	Light reflects off the metal.
Sound	Sparks hit the floor.
Light	The metal turns red.

H

Type of Energy	Example
Mechanical	The laser produces a beam of light.
Thermal	The temperature of the metal rises.
Electrical	The laser is part of a circuit.
Sound	Pieces of metal hit the floor.

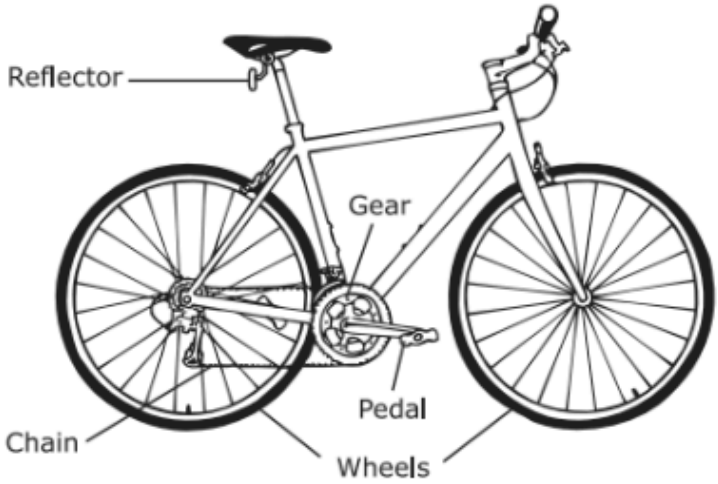
G

Type of Energy	Example
Mechanical	The laser produces sparks.
Thermal	The laser is part of a circuit.
Electrical	The light cuts the metal.
Sound	Sparks hit the floor.

J

Type of Energy	Example
Mechanical	The laser moves across the metal.
Thermal	The laser produces sparks.
Sound	Pieces of metal hit the floor.
Light	The laser produces a beam of light.

1 Many people ride a bicycle for fun and exercise. Some people ride a bicycle to work because it saves money and benefits the environment by reducing the use of fossil fuels.



Which of these is **not** an example of the bicycle using mechanical energy?

A The pedals, gears, and chain help turn the wheels.

B The wheels turn when the bicycle moves.

C The front wheel guides the bicycle as it moves.

D The reflector allows the bicycle to be seen at night.

33 Eight activities that use energy are listed in the box.

1. A bus driver starts a bus.
2. A soccer player kicks a ball.
3. A teacher writes notes on a chalkboard.
4. A chef stirs soup on a stove.
5. A bird flaps its wings and chirps to attract a mate.
6. A basketball referee blows a whistle.
7. A waiter pours water into a glass.
8. A person changes the channel on a TV.

Each of these activities requires the use of which kind of energy?

A Thermal

B Mechanical

C Electrical

D Sound

39 When a bat searches for prey at night, it makes sounds as it flies, and it uses the sounds' echoes to find its prey. When the bat flies and listens to echoes to locate prey, it is using —

A thermal energy and light energy

B sound energy and thermal energy

C mechanical energy and sound energy

D light energy and mechanical energy

1 A student recorded the time it took for all the water in a puddle on a sidewalk to evaporate after a rain. Which kind of energy causes water to evaporate?

A Light energy from streetlights

B Sound energy from passing cars

C Thermal energy from the environment

D Mechanical energy from nearby streets

11 A student made a list of activities that involve energy.

1. Sharks chasing a school of fish
2. A toaster heating bread
3. A cell phone charging
4. A tree limb falling to the ground
5. Tomato plants absorbing sunlight
6. A canoe floating down a river

Which activities on the list are examples of the use of mechanical energy?

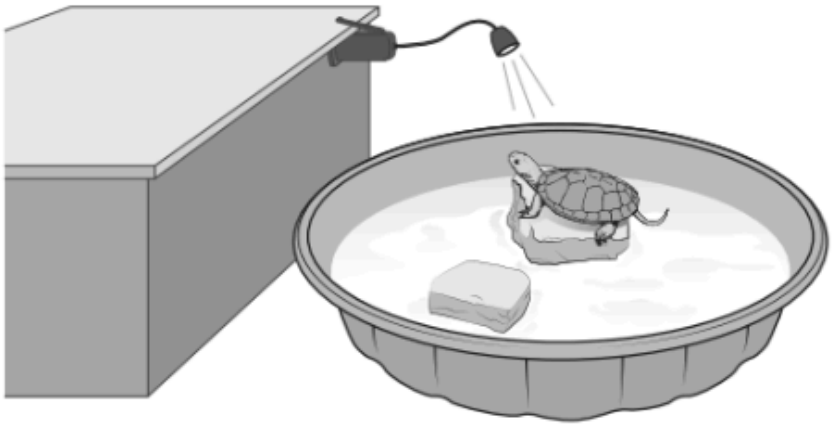
A Activities 1, 4, and 6

B Activities 2, 4, and 5

C Activities 1 and 2

D Activities 3, 5, and 6

10 A science class is observing a pet turtle in a small plastic pool. The students turn on a portable camping lamp that is clamped on to a counter next to the pool.



Which kind of energy is used by the portable lamp to produce light?

F Mechanical energy, because the lamp is clamped on to the counter

G Thermal energy, because the lamp increases the temperature of the water

H Electrical energy, because the lamp is battery-operated

J Sound energy, because the lamp vibrates when clicked on

22 An old-fashioned metal toy is shown below. When the candle is lit, the carousel of horses begins to turn.

Which of these correctly describes the energy that makes the carousel turn?

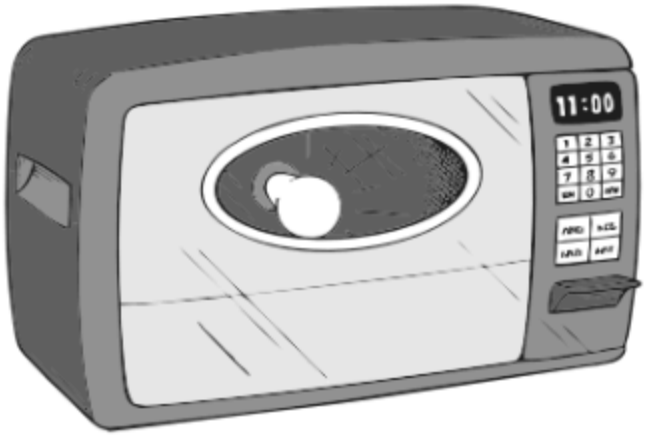
F Heat from the candle produces currents of warm air.

G Heat from the candle produces electrical energy.

H Light from the candle produces mechanical energy.

J Light from the candle produces wind currents.

13 The toy oven shown uses a lightbulb to bake small cakes.



What types of energy does the toy oven use to bake the cakes?

A Electrical and thermal

B Mechanical and electrical

C Thermal and mechanical

D Light and sound

43 A student uses a set of headphones to listen to music. Which of these objects uses the same source of energy as the headphones?

A A flute using wind energy

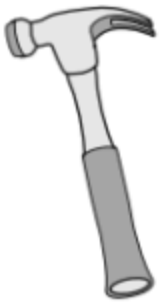
B A piano using mechanical energy

C A keyboard using electrical energy

D A teapot using thermal energy

21 Which object requires only mechanical energy to perform its main function?

A



Hammer

C

Thermometer

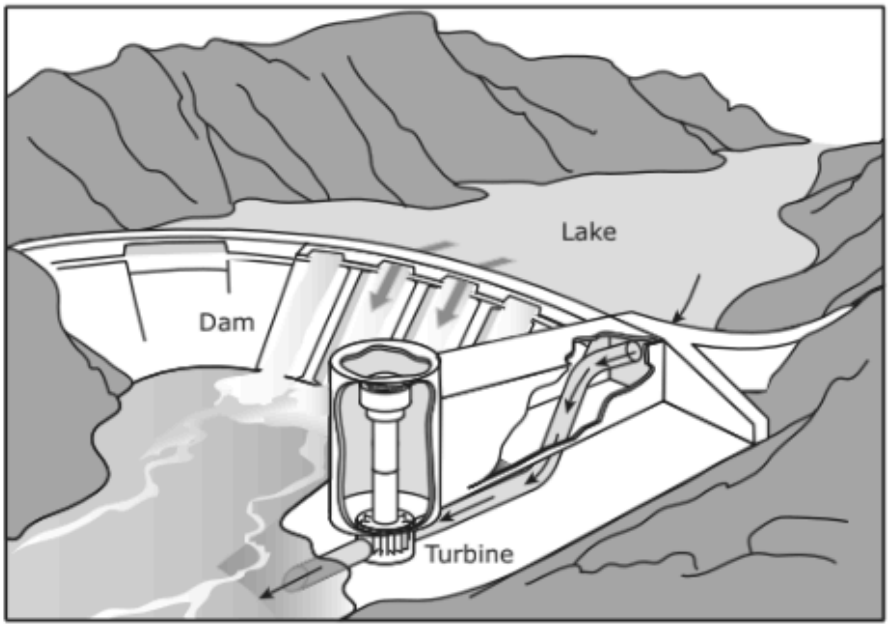
B

Fan

D

Iron

6 Water flows through turbines in dams like the one shown below. The flowing water makes the turbines spin.



What type of energy is used to make the turbines spin in this type of dam?

F Light energy

G Thermal energy

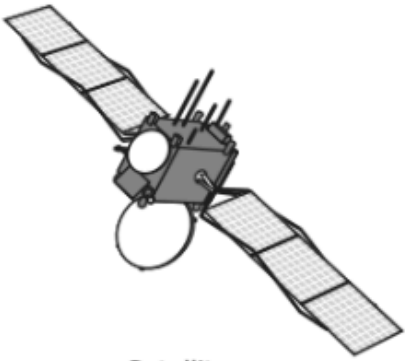
H Sound energy

J Mechanical energy

18 Three different objects that use the same source of energy are shown below.

Energy-efficient house

Calculator



Satellite

What is the energy source for these objects?

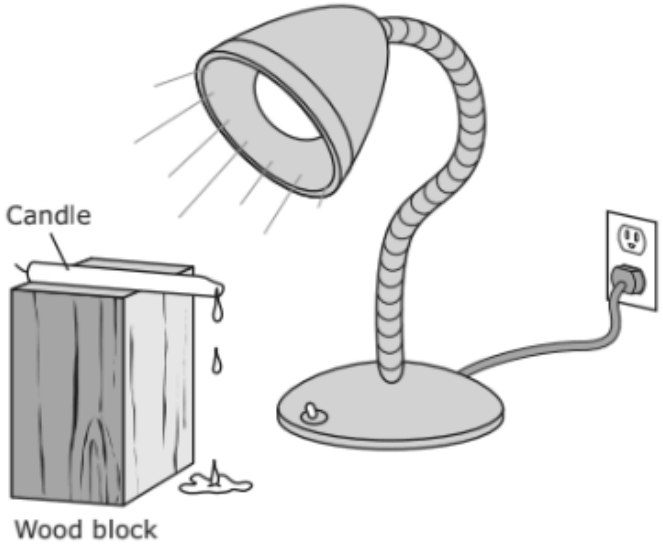
F Light energy

G Mechanical energy

H Sound energy

J Electrical energy

19 A class is learning about states of matter. The teacher shows the students how to set up the investigation shown in the diagram.



What kinds of energy are needed in this investigation to change the state of matter of the candle?

A Light, mechanical, and thermal

B Electrical and thermal

C Mechanical, light, and electrical

D Thermal and mechanical

1 Which of these devices is the only one NOT designed to produce both sound and light energy?

A

C

B

D

39 A cook uses the ingredients listed below to prepare a meal.

Open with

Ingredients

- Sugar cubes
- Salt
- Cooking oil
- Carrots
- Butter

Which table correctly shows the physical properties of these ingredients when placed in hot water?

A

Ingredient	Physical Property
Sugar cubes	Solid that becomes a liquid and floats
Salt	Solid that becomes a liquid and sinks
Cooking oil	Liquid that floats
Carrots	Solid that does not dissolve
Butter	Solid that dissolves

C

Ingredient	Physical Property
Sugar cubes	Solid that does not dissolve
Salt	Solid that dissolves
Cooking oil	Liquid that sinks
Carrots	Solid that does not dissolve
Butter	Solid that becomes a liquid and floats

B

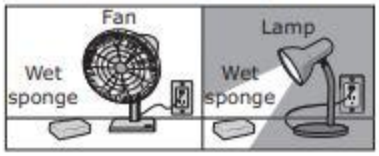
Ingredient	Physical Property
Sugar cubes	Solid that dissolves
Salt	Solid that dissolves
Cooking oil	Liquid that sinks
Carrots	Solid that dissolves
Butter	Solid that becomes a liquid and floats

D

Ingredient	Physical Property
Sugar cubes	Solid that dissolves
Salt	Solid that dissolves
Cooking oil	Liquid that floats
Carrots	Solid that does not dissolve
Butter	Solid that becomes a liquid and floats

7 A student uses the setup shown to investigate ways to speed up evaporation.

Evaporation Investigation



Which forms of energy are being compared in the student's investigation?

A Light energy and electrical energy

B Mechanical energy and electrical energy

C Light energy and thermal energy

D Mechanical energy and thermal energy

32 Many of America's large oil fields are found underground at the Permian Basin in West Texas. An area of the Permian Basin is shown.

How did these oil fields form?

F Dead plants and animals were buried for millions of years.

G Plants were eaten by consumers that left fossilized remains.

H Heat caused underground rocks to undergo chemical changes.

J Rocks at the surface of Earth melted and then solidified.

26 A family was vacationing in the mountains in a cabin that had no electrical power. They needed boiling water in order to prepare dried soup mix.

With no electrical energy available, which method would most likely provide enough thermal energy to quickly heat the water to boiling?

F Using a microwave oven to heat water in a glass jar for 3 minutes

G Shaking the water in a closed, insulated plastic bottle for 3 minutes

H Shining a battery-powered flashlight on a metal container of water for 10 minutes

J Placing a metal pot of water over glowing charcoal in an outdoor grill for 10 minutes