

Heat & Sound SOS

- GLE 0307.10.1 Investigate phenomena that produce heat.
- GLE 0307.10.2 Design and conduct an experiment to investigate the ability of different materials to conduct heat.
- GLE 0307.11.3 Investigate how the pitch and volume of a sound can be changed.

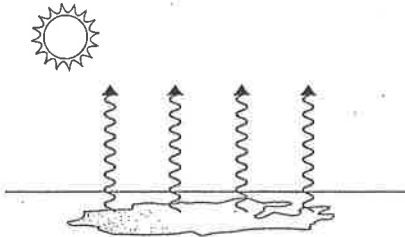
Heat Is a Form of Energy

Energy is the ability to make things move or change. **Heat** is energy that makes things feel warm. Light, sound, and electricity are some other forms of energy. Energy can change from one form to another.

Heat from the Sun

Earth's main source of heat is the sun. The sun's heat travels through space. This heat warms Earth's water, air, and land.

Heat from the sun makes water **evaporate**, or change from a liquid to a gas. When liquid water evaporates, it becomes the gas called water vapor. The water vapor rises into the air. Without the sun's heat, there would be no water vapor. In fact, there would be no liquid water. All the water on Earth's surface would be solid ice.



Heat from the sun makes water evaporate from Earth's surface.

How Heat Moves

In Lesson 22, you learned that heat is a form of energy that makes things feel warm. Heat moves from one object or material to another.

One way that heat moves is by conduction. In **conduction**, heat flows between objects that touch each other. Heat flows from a cup of hot chocolate to your hands by conduction. The hot chocolate touches the cup, and the cup touches your hands.

Heat always moves from a warmer object to a cooler one. Heat cannot move from your hands to a hot cup—unless your hands are hotter than the cup!



Heat always flows from hotter objects (hot drink) to cooler ones (air).

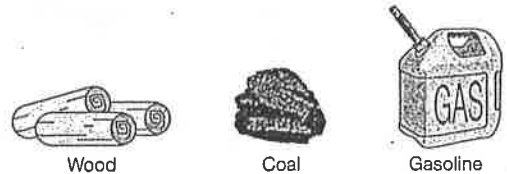
Heat moves through solids, liquids, and gases. But heat moves through some materials more easily than through others.

Heat from Fuels

Just like other living things, people need heat from the sun. But people also get heat from fuels. A **fuel** is a material that people burn to get energy. Fuels include wood, oil, gasoline, coal, and natural gas.

Fuels hold energy. When they burn, they give off much of the energy as heat.

People burn fuels to heat their homes and run their cars. Gasoline gives off heat when it burns in a car engine. The engine changes the heat into energy that moves the car. People use heat from fuels to make electricity, too. Machines change the heat into electrical energy.

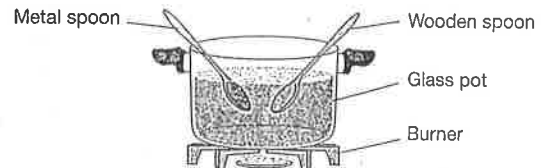


These fuels give off heat when they are burned.

Heat Conductors

Suppose you put a pot of water on the stove. You turn on the burner. (Do not try this without an adult's help.) Heat moves from the burner to the pot and then to the water. Soon the water starts to boil.

You put a metal spoon into the water. You also put a wooden spoon into the water. Heat moves from the water to the two spoons by conduction. But one spoon feels hotter. Which one? Why?

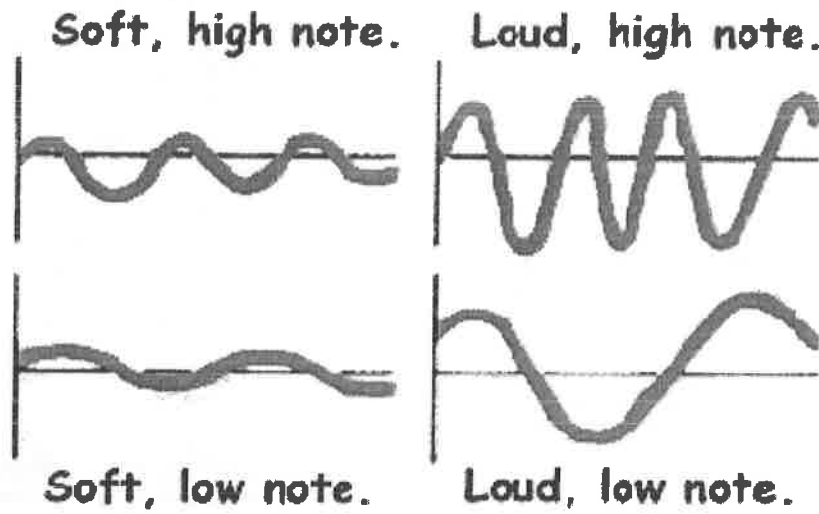


If you touch the metal spoon, it will feel very hot. In fact, if you try to hold it, it may burn your hand. But the wooden spoon will not feel hot. Heat moves easily through the metal spoon. It is a good **conductor**. The wooden spoon is not a good conductor.

Most metals are good conductors. Copper, iron, silver, and aluminum all conduct heat very well. Most pots and pans for cooking are made of metal. Heat moves easily through the metal into the food. Metal always feels warm or hot when heat is moving through it.

Sound is a type of energy. Sound is produced by vibrations.

Pitch is the highness or lowness of a sound. A high pitch is caused by short vibrations and a low pitch is caused by long vibrations.



The loudness (volume) of the sound depends on how hard a string is plucked. The sound will be louder the harder it is plucked.

