UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

الإمارات العربية المتحدة
وزارة التربية والتعليم

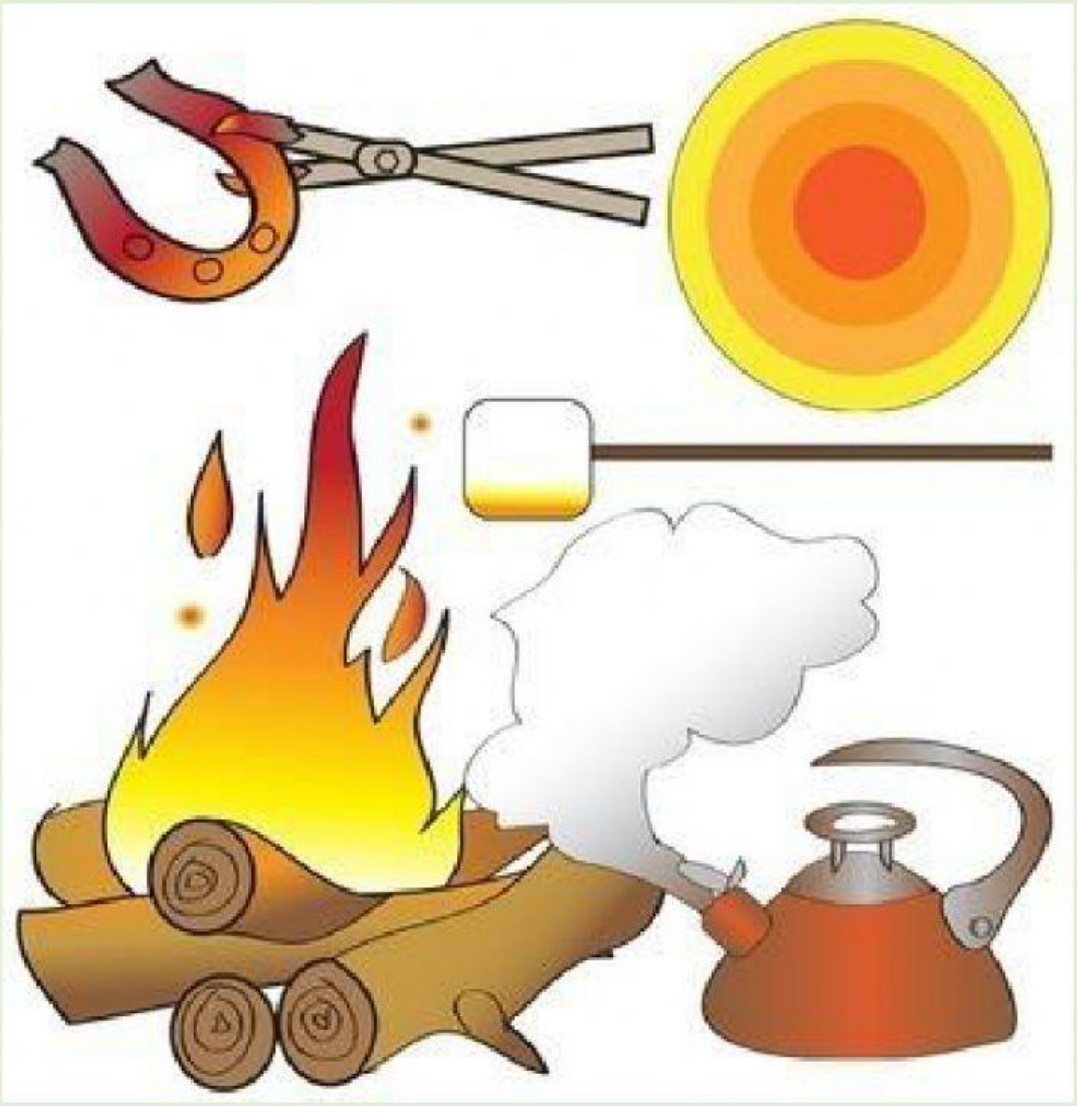
Khalifa City A School - Cycle 1

مدرسة مدينة خليفة أ / حلقة أولى

# SCIENCE

## CHAPTER 7- ENERGY

## LESSON 1- HEAT



**Created by- Nisha Tanwar**

# WHAT IS HEAT?

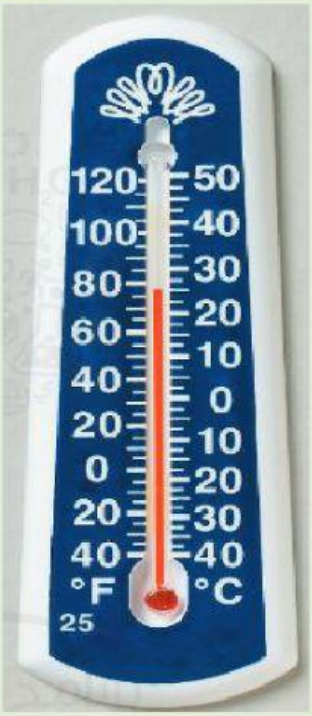
**Heat** is the flow of thermal energy from one object to another. Heat always moves from warmer objects to cooler objects. A warm object cools as it transfers heat.

- **Heat always travel in one direction.**
- **It will always travel from hot to cold.**

# TEMPERATURE

**Temperature** measures the thermal energy of the particles in a substance.

We measure temperature with a *thermometer*. Inside most thermometers is a liquid such as alcohol. As the thermometer warms, the particles of the liquid move faster and farther apart. This movement makes the liquid expand and rise inside the thermometer.

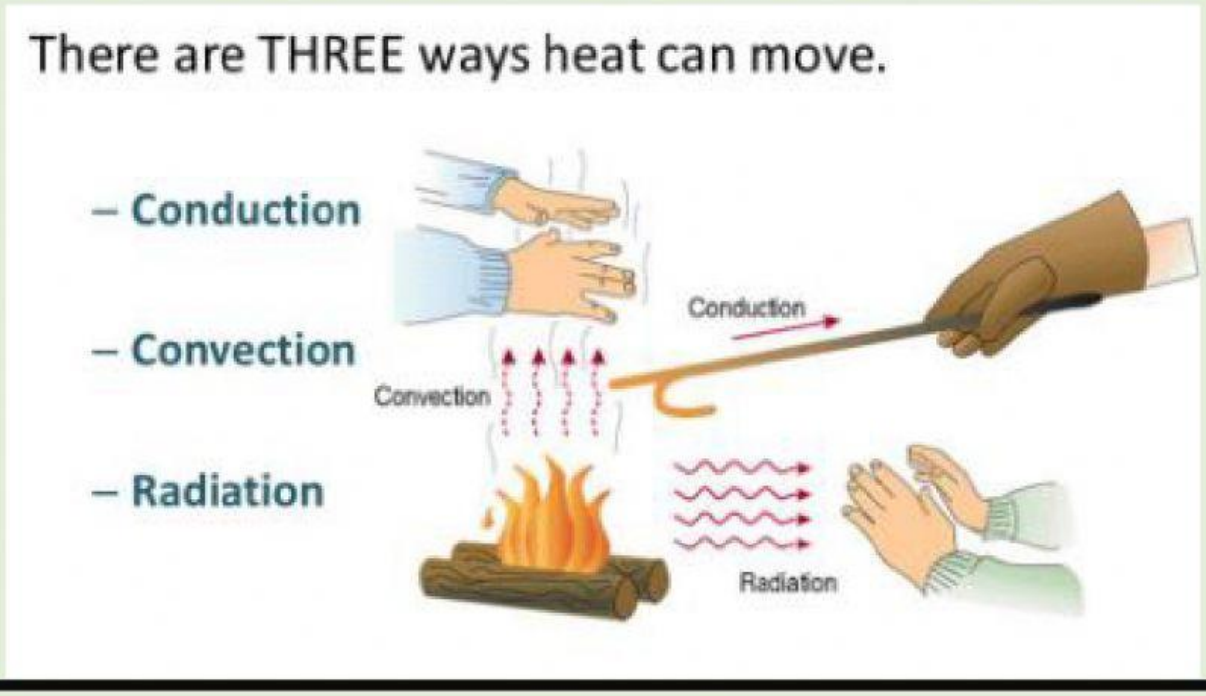


- Most scientist use Celsius scale
- Water boils at 100°C.
- Water freezes at o°C.

**WATCH VIDEO ABOUT HEAT AND TEMPERATURE**

# HOW DOES HEAT TRAVEL?

There are THREE ways heat can move.




## CONDUCTION

❖Conduction happens when two objects are touching

## CONVECTION

❖Convection transfers heat through liquids and gases

## RADIATION

❖Radiation does not need matter to transfer heat.

# HOW DOES HEAT TRAVEL?

## CONDUCTION

What happens when you heat a pan on a stove? The fast moving particles of the burner or flame hit the cooler particles of the pan. The collision gives the cooler particles more thermal energy. The particles of the pan start to move faster. Soon, the entire pan gets hot.

## CONVECTION

If you want to boil water, you can heat it in a pot. As the pot heats, it transfers energy to the water. The water particles at the bottom of the pot heat first. They move faster and farther apart. The hot water becomes less dense. The dense cooler water sinks, replacing the hot water. When all particles of water move at the same rate, the water boils.

## RADIATION

Radiation does not need matter to transfer heat. It can travel through space. Without radiation, energy from the Sun would not reach Earth. Hot surfaces transfer thermal energy to the air by radiation.

## WATCH VIDEO ABOUT CONDUCTION, CONVECTION AND RADIATION

## IMPORTANT LIVE WORKSHEET FOR PRACTICE

- **Click** here to practice more about conduction, convection, and radiation.
- **Click** here to practice more about conductors and insulators.

LIVE IMPORTANT!

# CONDUCTORS AND INSULATOR

## CONDUCTORS

- Conductors transfers heat easily
- Metals are good conductors
- All the pots are made of metals


## INSULATORS

- Insulators do not transfer heat very well
- Fat is an insulator that mammals have in their bodies
- It helps them to keep themselves warm in winter.

**WATCH VIDEO ABOUT CONDUCTORS AND INSULATORS**

## QUESTIONS FROM BOOK

1. _____ is the flow of energy of moving particles from material to another.
_____ is a measure of the average thermal energy in the moving particles of a substances.

2. **Vocabulary.** The transfer of heat through space is called _____

3. **Test Prep.** Many pots and pans are made of metal because metal is a good

A conductor.

C insulator.

B heat source.

D radiator.

4. **Heat cannot travel through space.**

5. **What material would make good insulators for a hot cup of soup.**

6. **The process that transfers heat through liquids and gases is called**

7. **The flow of thermal energy between objects is called**