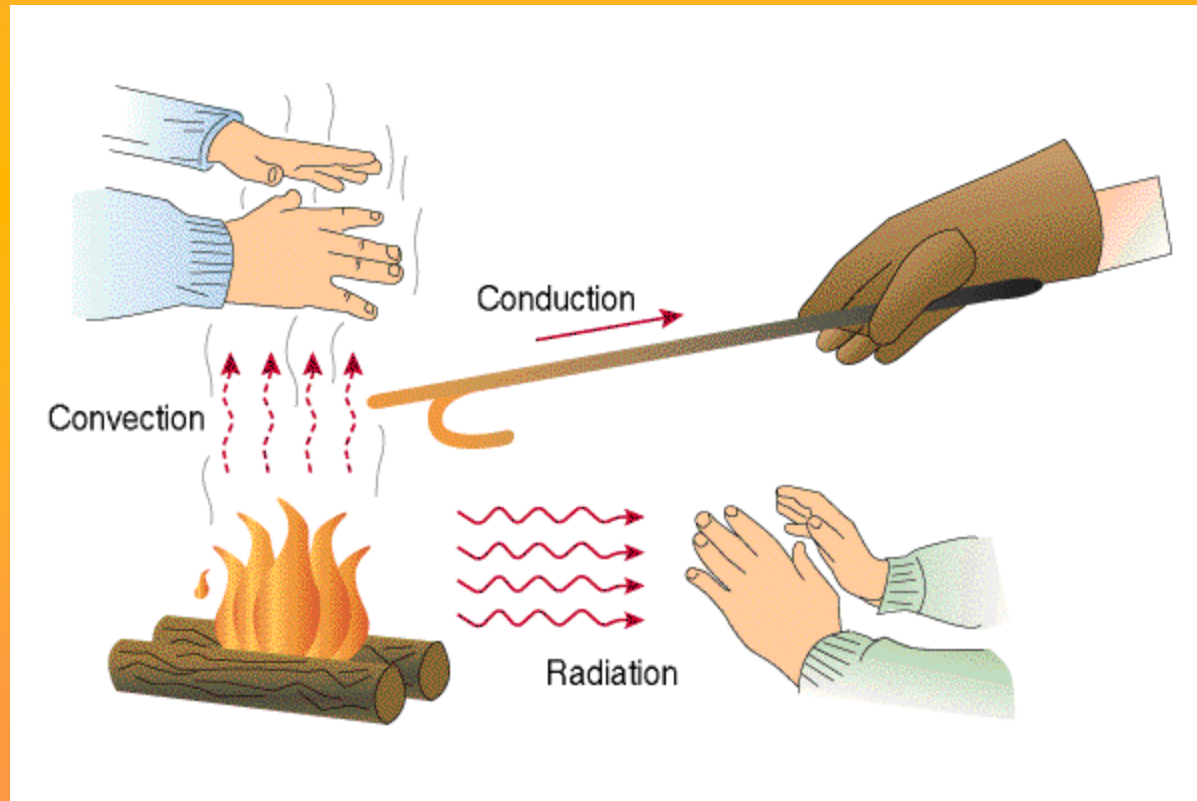


Conduction, Convection, and Radiation



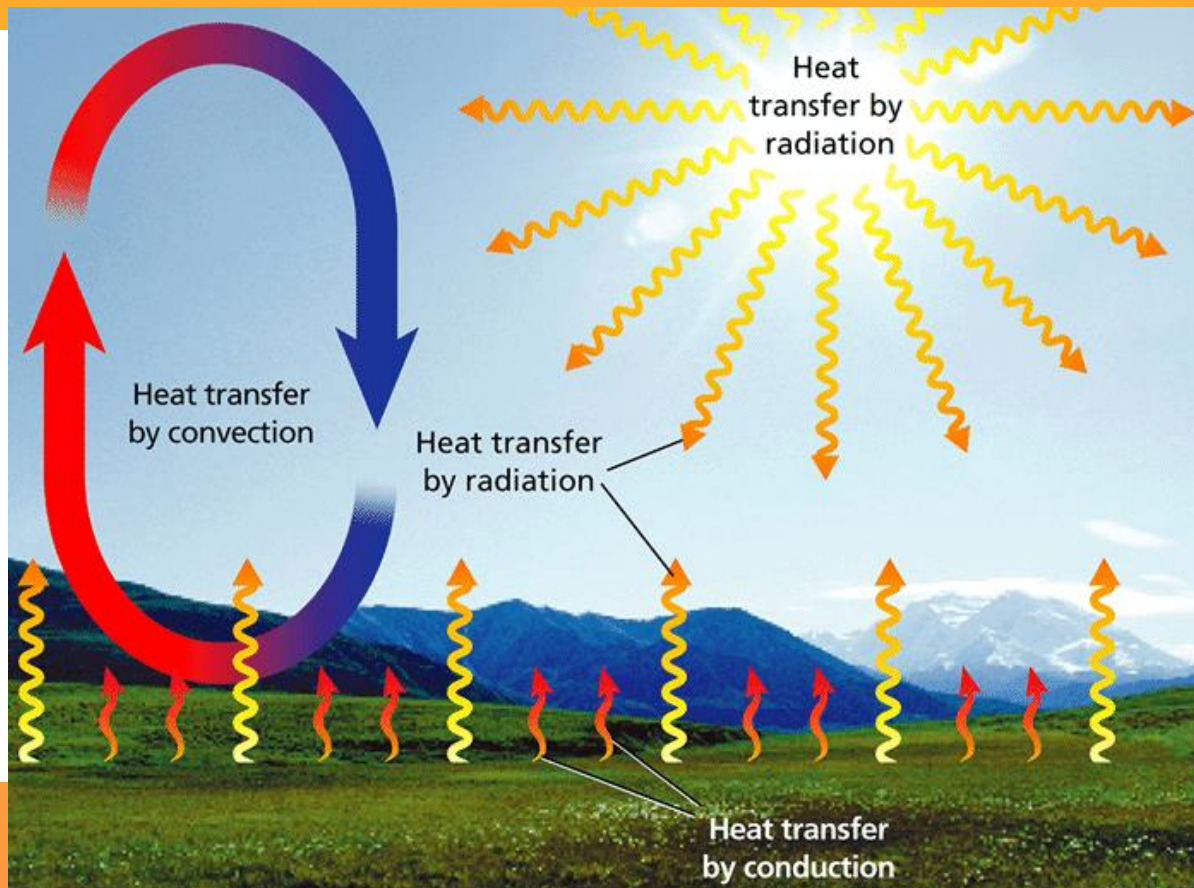
Heat Energy

- Energy is what makes things happen.
- All materials are made of tiny particles called molecules.
- Molecules are always moving.
- Heat is the energy given off by molecules moving.
- The amount of heat depends on how fast the molecules move.
- As the molecules move faster, they take up more space and make the object expand.

Heat Transfer

- Heat can be transferred from one object to another in 3 different ways:
 - Conduction
 - Convection
 - Radiation

How Heat Is Transferred

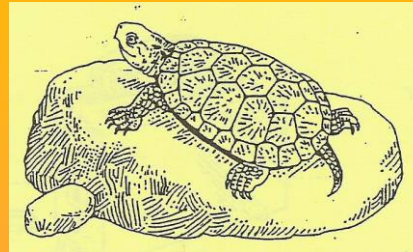
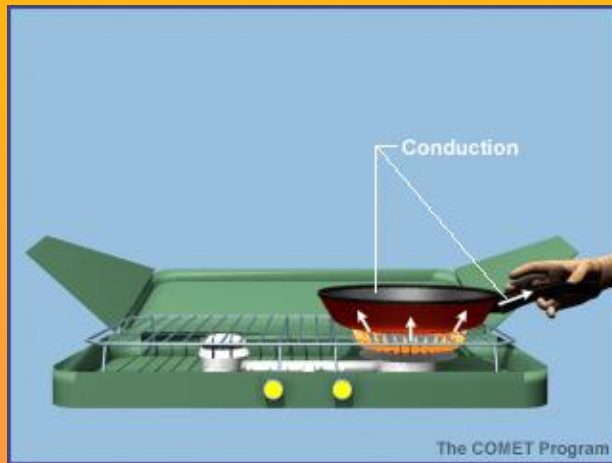
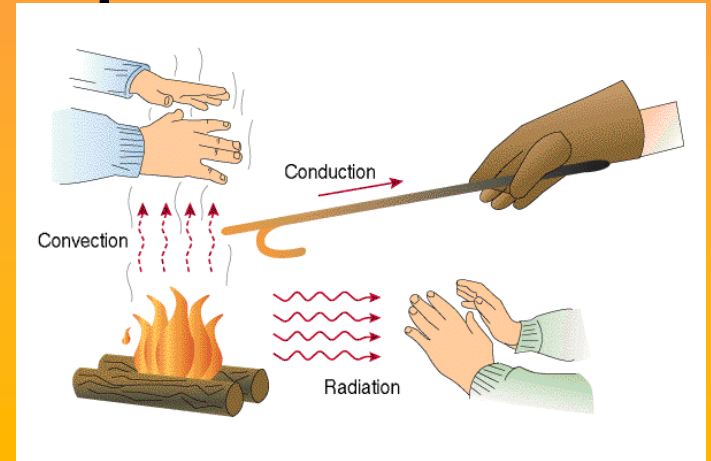


Conduction

- **Heat traveling through solids.**
- **Two objects must touch** or have direct contact.
- As molecules heat up they move faster and expand.
- When you touch one hot surface to another, the hot molecules bump into the other molecules which makes them start to move faster.
- An object gets hotter from the movement of the molecules.
- **All solid objects conduct heat, some are better conductor than others.**
- **Metals are good conductors.**

Examples of Conduction

List three examples.

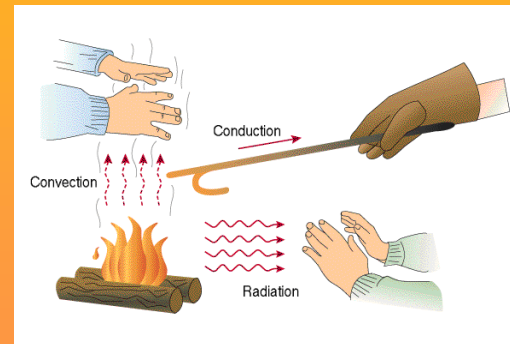
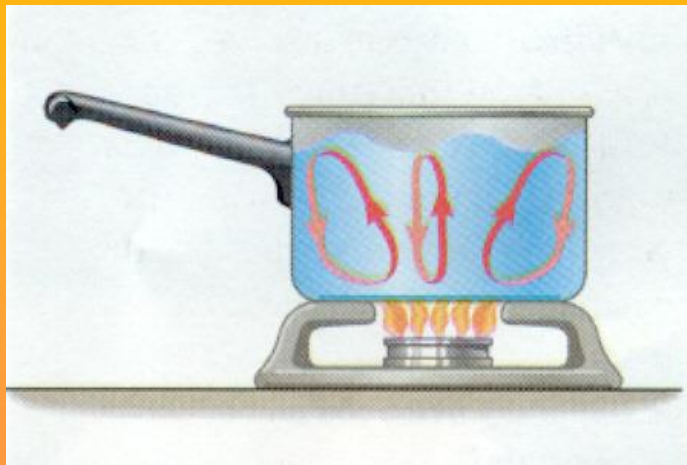
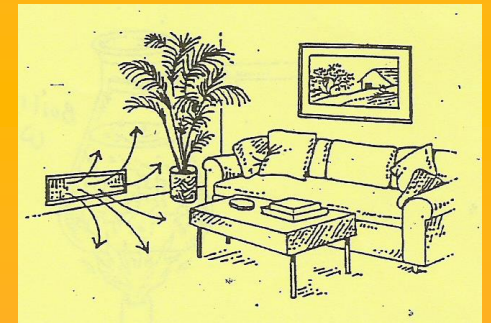
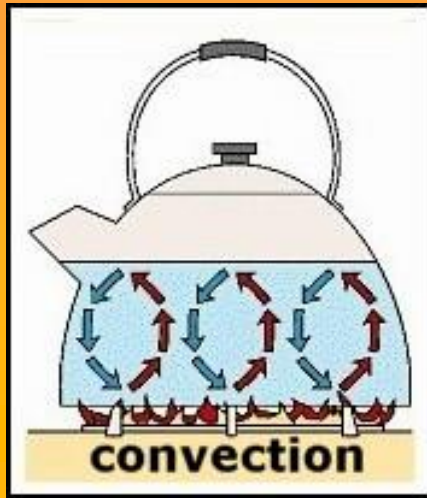


Convection

- **Heat traveling through liquids or gases**
- **As molecules heat up, the heat makes the molecules move more rapidly and expand.**
- **Creates currents in liquids or gases – hot air rises and cold air sinks.**
- **Uneven heating of our ocean creates ocean currents.**
- **Uneven heating of our atmosphere produces huge convection wind currents.**
- **Scientists use global and local wind patterns to predict weather.**

Examples of Convection

List two examples.

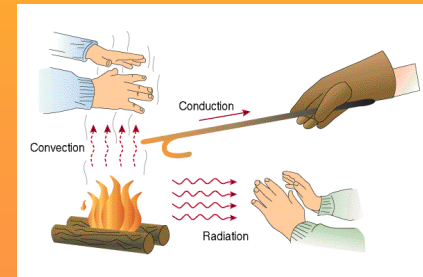
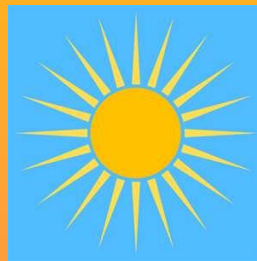
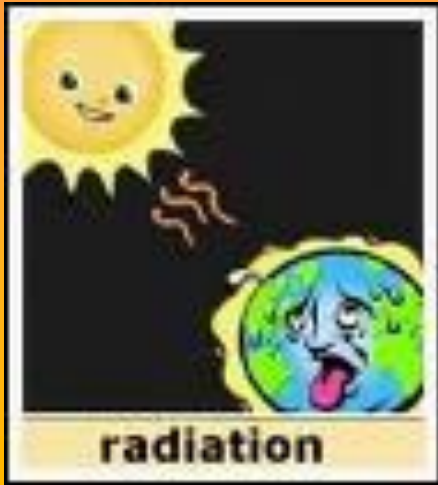


Radiation

- **Release of invisible heat energy waves from the sun or fire.**
- **No movement of molecules** to transfer heat.
- **Feel warm without touch – heat radiates.**
- Radiators got their name from this type of heat.
- When the radiant energy from the sun hits the earth, the earth soaks up the energy and changes it into heat.

Examples of Radiation

List two examples.



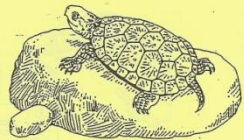
Balance

- **Whenever a hot object is placed near a cold object, the hot object will transfer heat to the cold object until they reach a state of balance.**
- **Balance happens when the temperatures of both objects are the same.**
- The fast moving molecules mix with the slow moving molecules until they are all mixed and balanced.

Methods of Heat Transfer

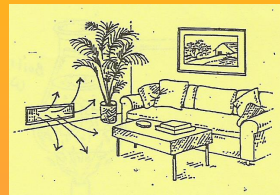
Conduction

- **Heat traveling through solids.**
- **Two objects must touch**



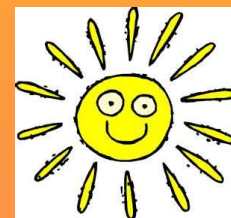
Convection

- **Heat traveling through liquids or gases**



Radiation

- **Release of invisible heat energy waves from the sun or fire.**
- **No movement of molecules**



<https://www.youtube.com/watch?v=yUEPGMnRqGs>