



Heating of the Earth

Conduction, Convection, &
Radiation



Popcorn

- What do heating the Earth & popping popcorn have in common?

Conduction

- Conduction is heat transfer through matter.
- Direct contact type of heat transfer
- Least significant with regard to heating the Earth's atmosphere

Convection

- Convection is heat transfer by the movement of mass from one place to another.
- take place only in liquids and gases

Uneven Heating

- Heat gained by conduction or radiation from the sun is moved about the planet by convection.
- heating of the Earth is not even
- amount of sunlight an area receives depends upon the time of day and the time of year.
- hot air rises, allowing cooler air to move in underneath the warm air.



Radiation

- can move through the relative emptiness of space
- majority of our energy arrives in the form of radiation from our Sun.
- the Earth gets warmer in that location and re-radiates heat into the atmosphere, making it doubly warm.

Popcorn Vs. Heating of the Earth



Air Popper



Oil Popcorn Popper



Microwave popcorn

Which of these 3 represents uses conduction to pop the popcorn? Convection? Radiation?

Air Popper

- The hot air transfers the heat to the cooler kernels, and when enough hot air heats the kernels they pop.
- This is an example of **Convection**



Oil Popper

- The heat is transferred by direct contact from the pan, to the oil, to the kernels of popcorn.
- This is an example of ... **Conduction**

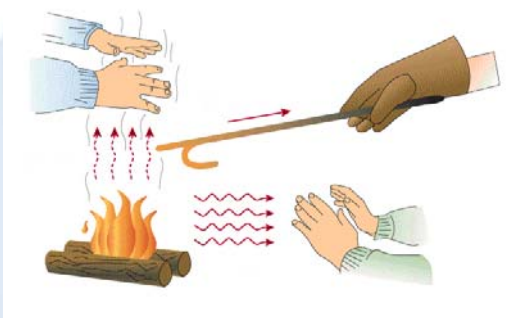


Microwave Popcorn

- Kernels are heated by the radiation in the microwave, and the kernels heat up, giving off more heat to the kernels surrounding it and making it "doubly warm."
- This is an example of ... **Radiation**



Other Examples



Heating of the Earth

- Draw an example how conduction, convection, & radiation heat the Earth.