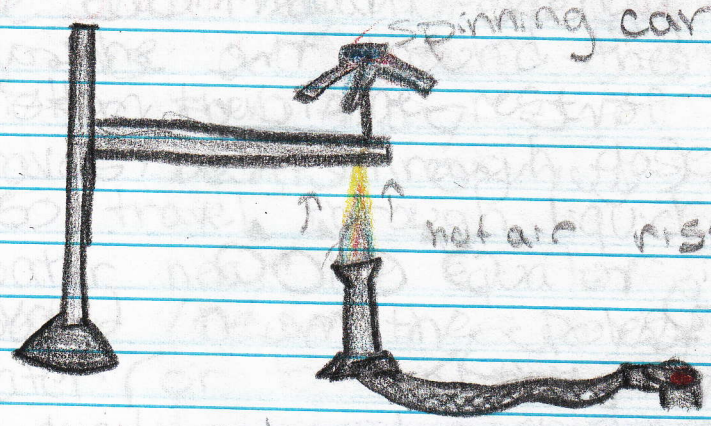
2/11/13

Heat Transfer

Learning Target: Idenify the characteristics of radiation, convection, and conduction.

Convection



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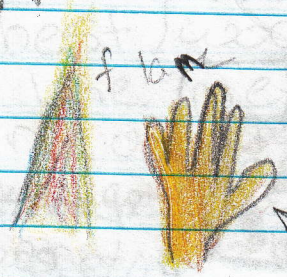
The hot air by the flame rises because it's less dense. The particles move faster, which makes the air less dense, so it's lighter than the surrounding cool air, causing it to rise

Convection occurs in gas liquid (both fluids, both flow)

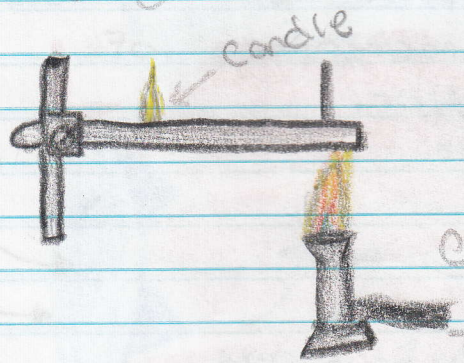
radiation



travels throug everything

the hand is hot

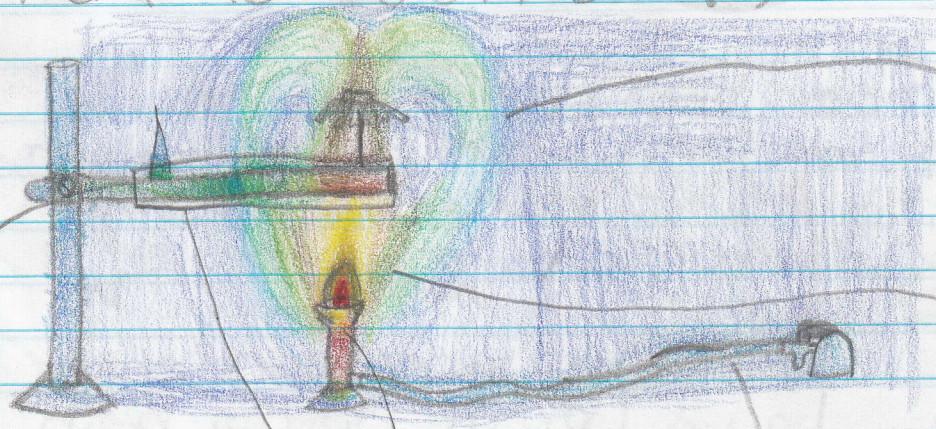
Conduction



The candle bottom melts + the candle falls off.

The metal particles speed up + spread out + the energy transfers to the particles next to each other (domino effect)

Occurs through solids, often through metal (particles next to each other)

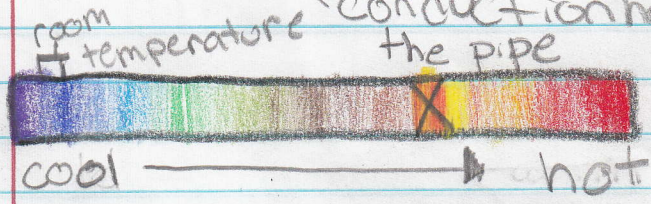


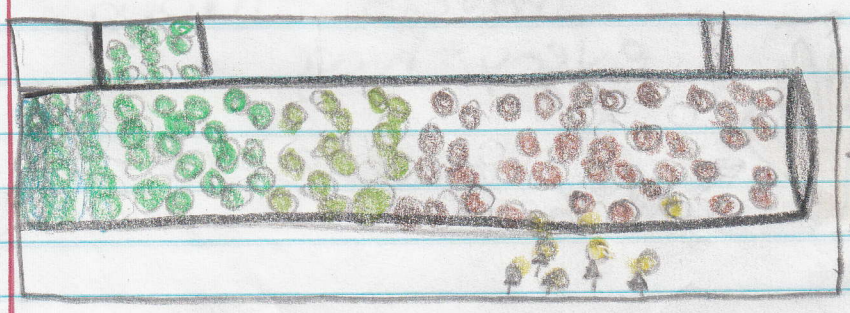
convection current

convection curren and radiation n the air

conduction heats the pipe

friction from the natural gas heats the pipe very slightly





The particles bump into each other causing the heat to spread

Summary Paragraph

The Sun's rays travel through space to warm the Earth. This type of heat transfer is called radiation or radiant energy. "In a solid, liquid or gas, radiant energy can travel through the space between molecules." (167) In the lab radiant energy was observed by the air around the flame being hotter than the rest of the air. Radiation travels best through gases. However, it can also travel through liquids, which is why water near the equator is warmer than water near the poles. To feel the warm water (or to feel the temperature of anything) conduction must occur. "Conduction is the transfer of thermal energy by collisions between particles in matter." (164) The particles in the warm water collide with the particles in skin, speeding them up. Nerves interpret this increased movement as heat. In the lab conduction could be seen when the candle fell off the metal pipe even though the flame was pointed somewhere else. Unlike convection, none of the metal pipe particles move very much (not noticeable). Conduction moves best/works best through dense solids like metal. "Convection is the transfer of thermal energy in a fluid (liquid/gas) by the movement of warmer and cooler fluid from place to place." (165) The water at the equator

is warmer and therefore less dense than the water at the poles. The ocean currents circulate this water with the cold water near the poles. This is convection. Convection occured in the lab when the air around the flame circulated (hot air rose and cool air sank). Radiation, conduction and convection are how the heat of the sun warms the whole world