

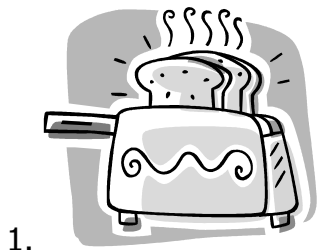
Worksheet: Methods of Heat Transfer (conduction, convection, and radiation)

Define conduction: transfer of heat by direct contact between materials

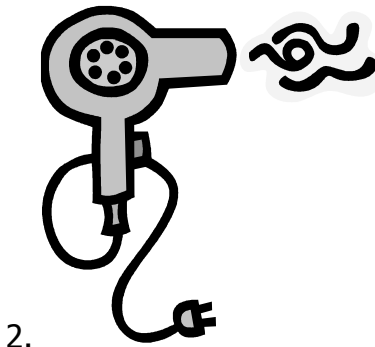
Define convection: transfer of heat by movement of large volumes of fluids moving to balance average KE (temperature)... hot rise, cool falls

Define radiation: transfer of heat not requiring a medium to move it

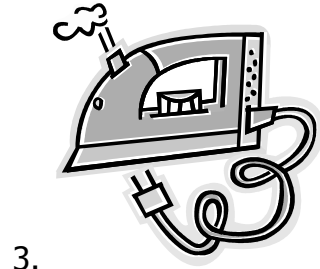
Identify the method of heat transfer that takes place in each illustration. Some illustrations may show more than one form of heat transfer.



Radiation



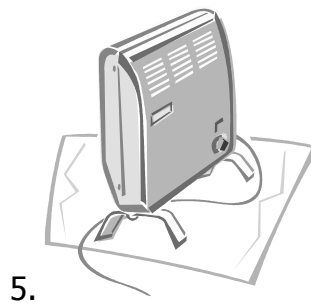
convection



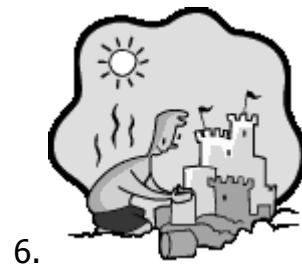
conduction



Radiation



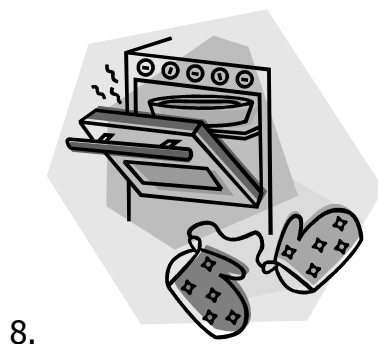
radiation



radiation



Radiation



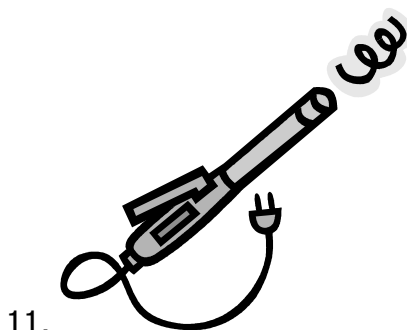
radiation



convection



Radiation, conduction



conduction



convection

In each of the following situations, identify the method of heat transfer taking place (conduction, convection, radiation). More than one process may be occurring.

1. Hot coffee is stirred with a spoon, the spoon gets hot due to conduction.
2. A chair is placed several feet from a fire in a fireplace. The fireplace has a glass screen. The side of the chair facing the fireplace gets warm because of radiation.
3. A certain type of decorative lamp contains colored liquids. These liquids form globs that break off and rise to the top of the liquid. The globs rise due to convection.
4. Near the ceiling of a room the air is warmer. The warm air rises because of convection.
5. A college student holds the back of his hand near an iron to see if it is hot. Heat is transferred to his hand by radiation.
6. A heater is placed under one corner of a water bed mattress. Warm water moves throughout the mattress because of convection.
7. A certain type of stainless steel cookware has a layer of copper applied to the bottom to help it heat evenly. The copper transfers heat to the pan by conduction.
8. In a swimming pool, the water near the surface is slightly warmer. The warm water rises because of convection.
9. One end of a copper rod is placed in a flame of a Bunsen burner. Small pieces of wax placed along the rod melt at progressively larger distance from the flame. Heat is transferred through the rod by conduction.
10. A house burns down. On the house across the street, all of the vinyl siding is twisted and warped by the heat. The heat was transferred across the street by radiation.
11. Warm air over the beach rises while cooler dense air from the ocean rushes in due to convection.
12. The metal skewer gets so hot that you drop your marshmallow in the campfire because of conduction.
13. A huge rock at the state park gets so hot during the day that you can't sit on it from radiation.
14. You lay on that same rock at night so that you can keep warm by conduction.
15. A fireman feels a door and it is hot from the fire on the other side due to radiation.
16. The cause of weather systems on earth is convection.
17. You are in the top bunk of a bunk bed and you want to turn the air conditioner on while your friend on the bottom bunk is fine is caused by convection.