

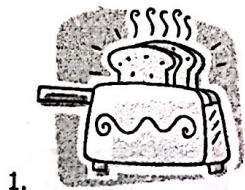
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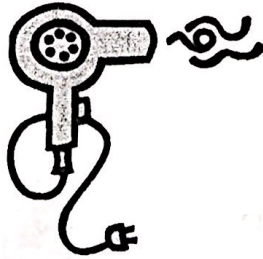
**Worksheet: Methods of Heat Transfer  
(conduction, convection, and radiation)**

- ① Define conduction: heat transfer through two things that are touching.
- ② Define convection: Heat transfer through air or water currents.
- ③ Define radiation: Heat transfer through electromagnetic rays.

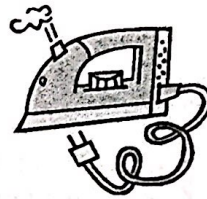
Identify the method of heat transfer that takes place in each illustration. Some illustrations may show more than one form of heat transfer.



1. radiation



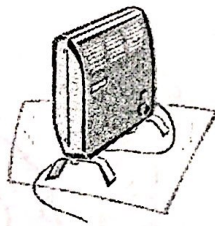
2. Convection



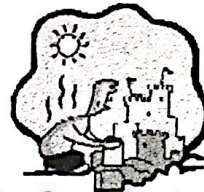
3. conduction



4. radiation



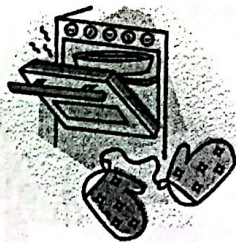
5. convection



6. radiation



7. radiation



8. Convection

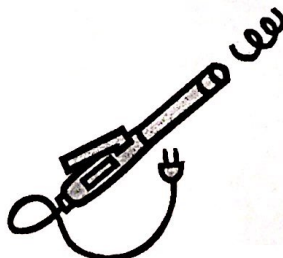


9. Conduction

"touching" the cup



10. Conduction  
(pan touching the flame)



11. conduction



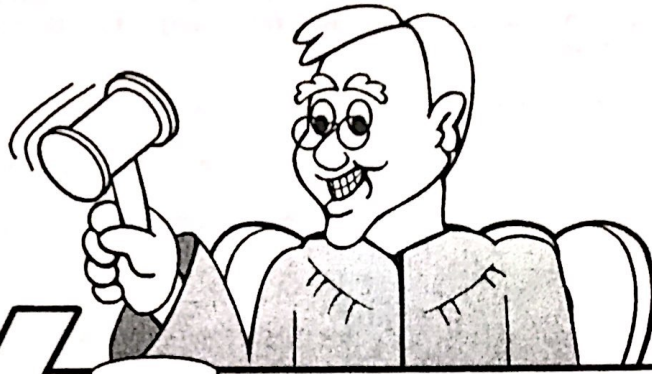
12. Convection

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

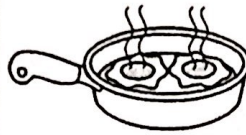
1. Hot coffee is stirred with a spoon, the spoon gets hot due to conduction.
2. A chair is placed several feet from a fire in a fireplace. The fireplace has a glass screen. The side of the chair facing the fireplace gets warm because of radiation.
3. A certain type of decorative lamp contains colored 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 conduction.
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.

# Order in the Court

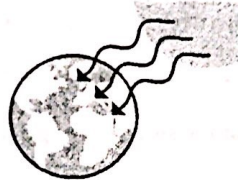
Decide whether each statement describes conduction or radiation. Then color each gavel by the code.













**Color Code**  
 red = conduction  
 yellow = radiation



**Conduction** is the movement of thermal energy from particles bumping into each other.



**Radiation** is the movement of thermal energy through matter and empty space.

-  1. an electric blanket warming a person
-  2. the sun warming the earth
-  3. candy melting in a person's hand
-  4. warmth felt above a hot lightbulb
-  5. glowing coils in a toaster toasting the bread inside
-  6. the warm handle of a pan on a hot stove burner
-  7. a pan of boiling water *convection*
-  8. the sun warming a person's skin
-  9. a red-hot metal rod in a campfire
-  10. warmth felt above a hot radiator

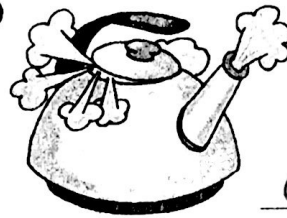
9)



Freezing outside on a cold day.

radiation

10)



Steam piping out of a teapot.

convection

11)



Burning your hand on a hot pan

conduction

12)



Ice cubes keeping lemonade cold.

Convection

13)



Laying out in the sun.

radiation

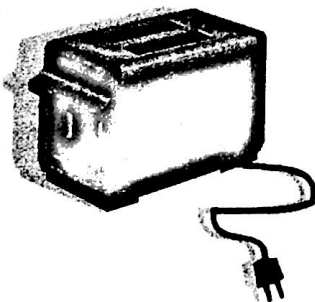
14)



Roasting marshmallows over a fire.

radiation

15)



Making toast in a toaster.

radiation

16)



Heating a kettle on a hot furnace.

Conduction