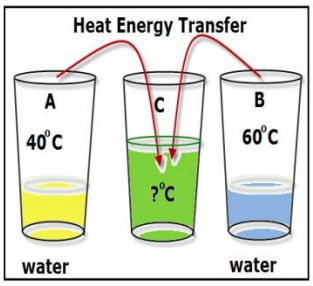
Heat and Energy Transformations Worksheet

1. Using the picture below, answer the questions.



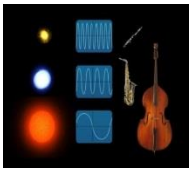
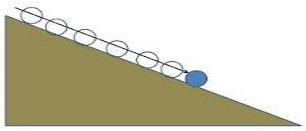
   a- Which cup, A, B or C has more heat energy?
   b- Once cup A and B are mixed together into cup C, the temperature in cup C will be 50°C. Explain if cup A passed on its cold to cup B or cup B passed on its warmth to cup A.

2. For each of the following statements, write the form of energy that will result from the energy transformation described.
   a) You turn on an electric radiator.
   b) Gas powers your car.
   c) The nuclear power plant begins operation.
   d) The microwave.
   e) A lamp lights up the room.
   f) An apple gives me energy.
   g) The ball my brother threw broke the window.
   h) The sun melts the snow in the spring.

3. You have to melt a 100-g block of ice. Two methods are proposed: The first method is to melt it with a burning match. The second is to place the block in a bucket of hot water at 45°C. Which of these methods will be more efficient? Explain your answer by referring to the concepts of temperature and heat.

4. Name the form or forms of energy in each of the following energy sources.




5. Does each of the following situations describe a transfer or a transformation of energy, or both?

a) Solar energy makes photosynthesis in plants possible.
b) Energy from a heating system warms the air in a home.
c) Power plants generate electricity that is then delivered to our homes.
d) The snow you are holding in your hand begins to melt.
e) Your hands are being warmed by the campfire.
f) Your radio which is plugged into an outlet is playing very loud rock music.

6. Two beakers contain different amounts of water at the same temperature.

Beaker A- 100 mL of water Beaker B- 200 mL of water

Which beaker has more thermal energy? Why?

7. A pot of water is put on the stove in order to make tea. The water boils because the kinetic energy of the water molecules increases. Which of the statements below are **false**:

1. Heat is a measure of the thermal energy of the water molecules.
2. Temperature is a measure of the thermal energy of the water molecules.
3. The heat energy from the stove is being transferred into thermal energy in the water molecules.
4. The temperature of the stove is being transferred into energy in the water molecules

A) 1 and 3 B) 1 and 4 C) 2 and 3 D) 2 and 4

8. What does temperature measure?

A) The number of particles in an object
B) The movement of particles in an object
C) The amount of matter in an object
D) The relationship between mass of a liquid and volume

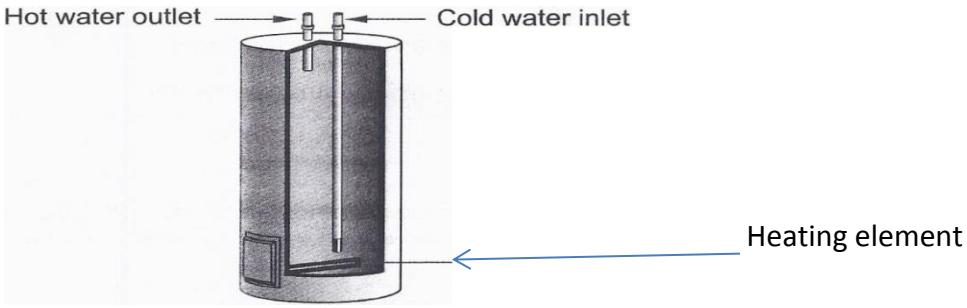
9. Below is a picture of a water misting fan. In the back portion of the fan there are two AA batteries connected to a series circuit which allows a small motor to work. As you press on the nozzle two things occur:

1- Water comes out of the center of the fan.
2- The series circuit is closed because of the contact made and the blades will spin as a result.

Several energy transformations are needed to make the misting fan work. Explain two energy transformations that occur when the water misting fan is in operation.

10. Below is a picture of a wind turbine attached to a house which helps to create energy. Give three energy transformations which can be created.

11. An electric heater has an element that heats the cold water entering the heater.



When the water heater is turned on, why does the water in it heat up?

A) Because the heat given off by the heating element is transferred to the water molecules.
B) Because the heat given off by the heating element is transformed into a temperature.
C) Because the temperature given off by the heating element is transferred to the water molecules.
D) Because the temperature given off by the heating element is transformed into heat.

12. Match the type of energy with its appropriate definition.

a- Chemical energy
b- Elastic energy
c- Electric energy
d- Kinetic energy
e- Radiation energy
f- Sound energy

___ Vibrations or disturbances of matter
___ Stored energy where the bonds can be broken
___ Results in the deformation of an object
___ Produced when electrons flow through a conductor
___ Energy transported by electromagnetic waves
___ Energy of movement