

Temperature and Kinetic Energy

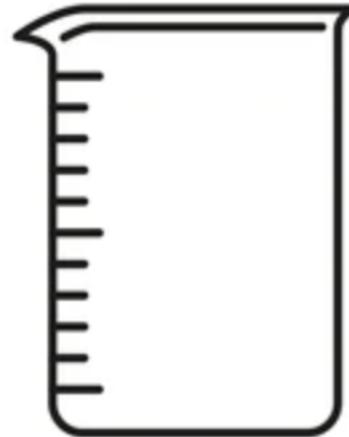
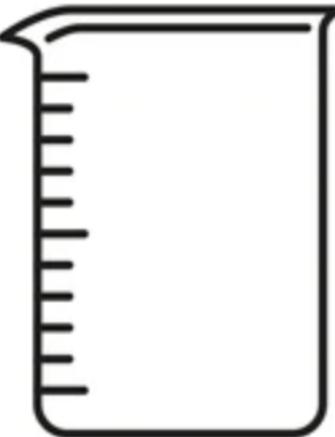
Engage

Materials: Teacher Demo: Clear beaker of hot water, clear beaker of cold water, red food coloring

What To Do:

1. Place a beaker of hot water and a beaker of cold water in a place that all students can see it.
2. Predict what will happen when a drop of food coloring is placed in both beakers?

3. When the water is very still, place one drop of food coloring in each beaker at the same time.
4. Draw what you see happening in the beakers in the space below.

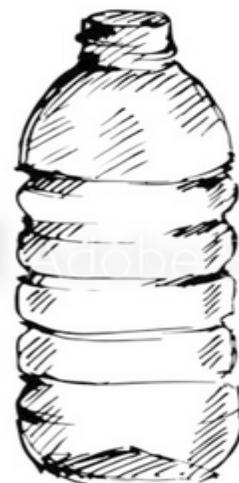


Explore

Materials: plastic water bottle, balloon, container of ice and water, container of warm tap water

What To Do:

1. Blow up the balloon a little bit to stretch it out. Then let the air out.
2. Place the balloon over the mouth of the empty plastic bottle.
3. Stand the bottle in the center of the container filled with hot water. Make sure it stands straight up. Wait a few minutes and watch what happens to the balloon.
4. Remove the bottle from the hot water and place it in the container with the cold water and ice. Make sure it stands straight up. Wait a few minutes and watch what happens to the balloon.
5. Repeat several times.
6. Draw and label what happens to the balloon in the hot and cold water.



Explain



TEMPERATURE

THERMAL ENERGY

KINETIC ENERGY

Elaborate

1. Watch “The Kinetic Molecular Theory” animation from <https://www.youtube.com/watch?v=1Jtw8g795Us>
2. Use the Word Bank to help you fill in the blanks.

WORD BANK

most matter freely move moving
high less packed particles hardly

1. The Kinetic Molecular Theory is the theory that all _____ is made up of atoms and molecules that are always _____.
2. In high temperature, the particles have _____ energy.
3. In low temperatures, the particles have _____ energy.
4. In solids the particles _____ move at all and are tightly _____.
5. In liquids the _____ have more energy and the freedom to _____ around.
6. In gasses the particles have the _____ energy and move around _____.

Questions:

1. Why did the food coloring spread out through the water?

2. Why did the food coloring in the hot water spread out faster?

3. Why did the food coloring in the cold water spread out slower?

4. Why did the balloon expand when placed in the warm water?

5. Why did the balloon shrink when placed in the cool water?



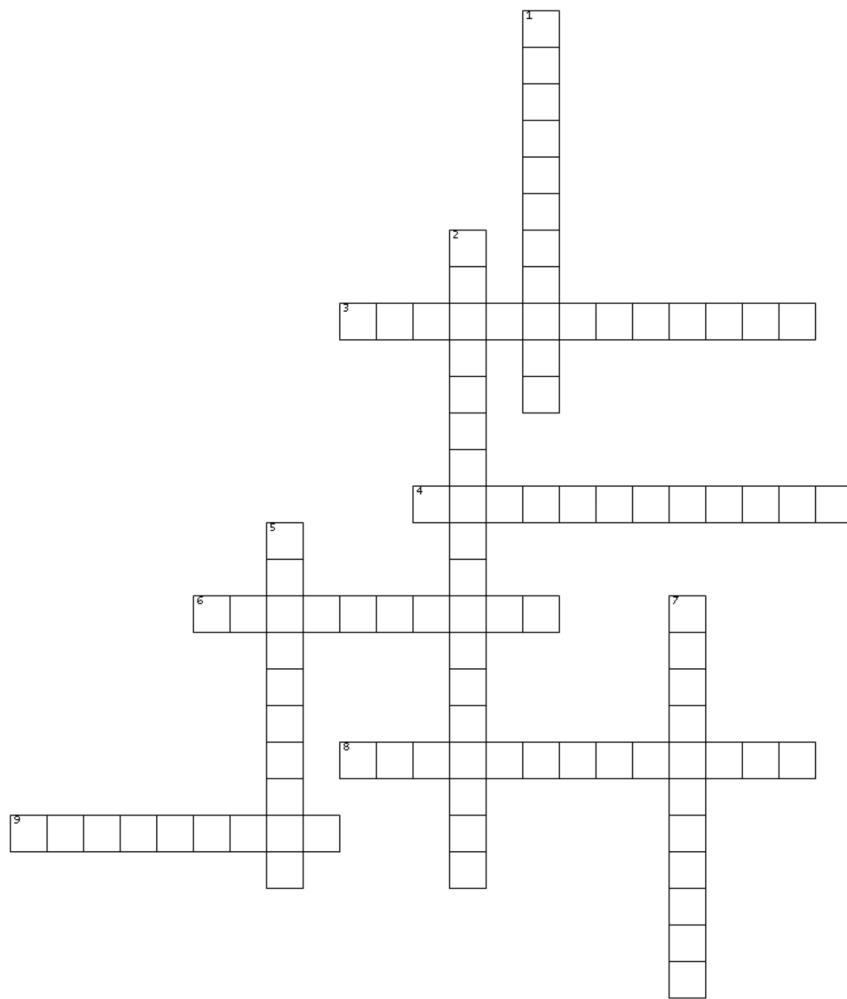
THEMODYNAMICS



Evaluate

Name _____

period _____



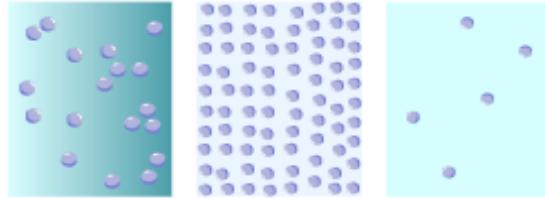
ACROSS

3. The energy of motion
4. The flow of thermal energy from hot to cold
6. The transfer of thermal energy between matter that is in direct contact
8. The energy that comes from the movement of tiny particles
9. The transfer of energy by electromagnetic waves

DOWN

1. A state of balance where opposing forces or actions are equal so there is no overall change
2. When two or more objects are the same temperature
5. The transfer of thermal energy by the movement of warmed matter.
7. A way to measure how hot or cold something is

1. Which of the following pictures show the particles found in a liquid? Circle the correct one.



2. How are the particles in a hot liquid different from the particles in a cold liquid?

- A. There would be no difference
- B. They would be moving faster
- C. They would be moving slower
- D. They would not be moving

3. The relationship between temperature and kinetic energy can be explained by which of the following statements?

- A. The higher the temperature, the lower the kinetic energy.
- B. The lower the temperature, the higher the kinetic energy.
- C. The higher the temperature the higher the kinetic energy.
- D. The temperature does not change the kinetic energy.

4. The energy of motion is called –

- A. Thermal Energy
- B. Kinetic Energy
- C. Potential Energy
- D. Radiant Energy

EXIT TICKET

Temperature and Kinetic Energy

1. Which of the following pictures show the particles found in a liquid? Circle the correct one.