Name _____
Date _____ Per. _____

Compression, Diffusion, and Thermal Expansion

Compression:

_____
_____
_____

Fill a syringe with water. Close the end of the syringe with your finger and try to compress the liquid.

What happens to the particles of a liquid as you try to compress it?

_____

Fill the syringe with air. Close the end of the syringe with your finger and try to compress the gas.

What happens to the particles of a gas as you try to compress it?

_____

Diffusion:

_____
_____
_____

Partner Work:

- Gather Materials: Plastic cup, 1 Petri dish with clay in it, 1 birthday candle and 1 toothpick.
- Place your birthday candle in the clay.
- Fill the plastic cup half full with water.
- Pour water into the bottom of the Petri dish about 2/3 high.
- Add a drop of food coloring and watch **"diffusion"** for a few seconds.

The Burning Candle

Partner Work:

- Gather Materials: One test tube and 1 metric ruler.
- Stir the food coloring in your petri dish with your toothpick.
- Light the candle and wait a few seconds.
- Cover the candle with the test tube in one swift movement. Make sure you press the test tube all the way down to the glass.
- Observe what happens. Use your ruler to measure the height of the water before removing the test tube.

1. How high does the water rise in centimeters with one candle?

_____

- Get another birthday candle and repeat the process using two candles in the clay.

2. Make a hypothesis about what will happen with two candles burning under the test tube.

_____

_____

3. How high does the water rise in centimeters with two candles?

_____

Scientific Explanation:

_____ produced by the candle flame causes the air inside the test tube to_____. Some of the expanding air_____. The candle flame gradually consumes oxygen and when the oxygen level becomes too low to sustain the flame, it _____and the air inside the test tube begins to _____ down again. The cooling gas inside the test tube _____and creates a partial vacuum (the pressure inside the test tube is lower than the pressure outside the test tube. The higher pressure on the _____ forces water up into the test tube until the _____ and _____ pressure are equal.

Thermal Expansion:

When substances are heated, bonds in the particles are weakened and the particles move faster causing the substance to expand.

4. Does the height of the water change when you increase the number of candles used? Why or why not?

Watch the following video clips. Circle one of the clips and describe how it is an example of thermal expansion and/or contraction.

Egg in a Bottle – No Sound
Egg in a Bottle – Steve Spangler
Mr. Edmonds – Expansion and Contraction
Expansion and Contraction Experiment