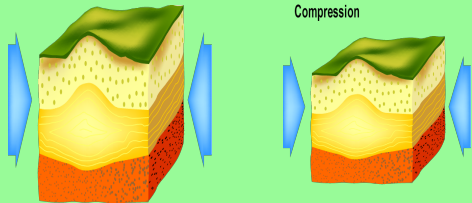


Compression Diffusion and Thermal Expansion

Feb 2-12:15 PM

Compression:

a force that tends to shorten or squeeze something into a smaller space, decreasing its volume



Feb 2-11:59 AM

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

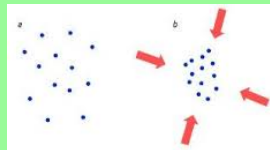
What happens to the particles of a liquid as you try to compress it?

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?

Feb 10-9:11 PM

Compression Video



Molecules in a are separated between each other. The distance is dictated by the internal energy, assuming there is no other external force.

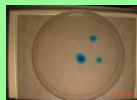
Molecules in b are subject to external pressure. Hence, the net force closes the distance between the molecules.

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Jan 28-2:02 PM



Diffusion



Diffusion is the movement of particles from an area of higher concentration to an area of lower concentration.

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.

Feb 10-9:18 PM

Jan 28-2:14 PM

Diffusion Video



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.

Jan 26-3:51 PM

Jan 26-3:29 PM

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

Get another birthday candle from your bucket, 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?

Feb 10-9:28 PM

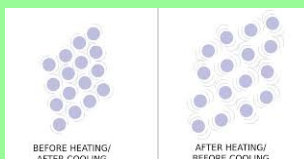
Thermal Expansion and Contraction: A Scientific Explanation

Heat produced by the candle flame causes the air inside the test tube to expand. Some of the expanding air escapes. The candle flame gradually consumes oxygen and when the oxygen level becomes too low to sustain the flame, it expires and the air inside the test tube begins to cool down again. The cooling gas inside the test tube contracts 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 outside forces water up into the test tube until the internal and external pressure are equal.

Feb 2-12:21 PM

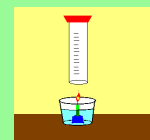
Thermal Expansion is an increase in size, volume or quantity usually due to heating.

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



Feb 2-12:08 PM

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



Feb 10-9:32 PM

Thermal Expansion and Contraction Videos

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

Egg in a Bottle - No Sound



Feb 2-12:57 PM

Egg in a Bottle - Steve Spangler



Jan 28-1:53 PM

Mr. Edmonds Expansion and Contraction



Feb 7-4:37 PM



Expansion and Contraction Experiment

Jan 28-2:01 PM



Jan 28-2:06 PM