

Water Test

Study Guide

Please note that this is a tool to help you study. It does not mean that everything on the test is in this guide. Please use your lab sheets and blue books to study as well.

Definitions

density – how much of a substance is in a unit of space.

water vapor – invisible area where water stops being a liquid and starts being a gas.

steam – cooling water vapor made up of tiny water droplets that have condensed.

evaporation – the process of water changing into vapor.

atoms – tiny particles that make up matter.

molecule – combination of atoms which are bound together.

electrons – negative parts of an atom (e^-).

protons – positive parts of an atom (p^+).

neutrons – neutral parts of an atom that have no positive or negative charge (n^0).

polar molecule – when the ends of a molecule are positively and negatively charged.

cohesion – the force that causes **similar** molecules to be attracted to each other holding them together.

adhesion – the “sticking” force that holds one material to a **different** material.

surface tension – occurs when surface molecules in a liquid are held together by strong cohesive forces. The “skin” on the surface of the liquid resists being broken.

buoyancy – the ability to stay afloat caused by the balancing of forces, such as water pressure pushing up and gravity pulling down on a floating object. There are three types of buoyancy: positive buoyancy – when an object floats, negative buoyancy – when an object sinks, and neutral buoyancy when an object hovers between sinking and floating.

displace – movement of water due to an object being placed in the water.

Investigations Review

Drops

We learned about **cohesion** in this lab.

Cohesion is the force that causes similar molecules to be attracted to one another. Cohesion is what holds molecules together. They can stick together very tightly, not very tightly, or anywhere in between.

We put different liquids (water, soapy water, corn oil and alcohol) on wax paper to see which one was the most cohesive.

Sliding Drops

In this activity we learned about **adhesion**.

Adhesion is the “sticking” force that holds one material to another material.

In this lab we used water, soapy water, corn oil and alcohol to see which one stuck on to wax paper the most and which one stuck on the least. You may have done this experiment with honey at home. Please be able to tell which of these materials is the most adhesive and which is the least.

Pin Float

In this lab we learned about **surface tension**.

Surface tension occurs when surface molecules in a liquid are held together by strong cohesive forces.

In this lab you needed to get a pin to float on top of the water without sinking. The molecules formed a “skin” on the top of the water and then the pin could rest on the skin.

We added a drop of soap to the water and the pin sank. This is because the soap broke the “skin” or surface tension and the pin, being denser than water, didn’t have anything to sit on top of so it sank.

Strong Water

In the lab you used an eye dropper to put water droplets on the side of a penny. Your job was to see how many drops of water could fit onto the penny without spilling off. You may have noticed that the water molecules formed what looked like a bubble on top of the penny. This bubble may have even overlapped the edge of the coin. Eventually the **surface tension** could no longer hold the weight of the water and it spilled off of the penny.

Floating Clay

In this activity we learned about buoyancy and displacement.

Buoyancy is the ability of an object to float.

Displacement is when water is moved due to an object being placed in the water (such as how water in the bathtub moves up higher when you get into the tub).

In this activity we took a ball of clay and put it into a beaker of water to see if we could get it to float. We changed the shape of the clay to get it to float. We found that a bowl (or balloon) shape was able to float, and that this displaced more water than the ball did (the water being displaced was heavier than the clay).

Underwater Volcano

In this lab we learned about density.

Density is how much of a substance (how many molecules) are in a particular space.

Mr. Miller took a beaker and filled it with cold water. He filled a smaller beaker with hot water (that was colored red). Since the hot water is less dense (the molecules are further apart) it came to the surface (there was a top layer of colored water above the colder clear water).

The Mathematics of Density

You will need to be able to calculate density given two of the three parts of the equation:

$$D = \frac{M}{V}$$

To find out the density of an object you use the mathematical equation above.

M = Mass – often measured in grams (g).

V = Volume – often measured in cubic centimeters (cm³).

D = Density – often measured in grams per cubic centimeter (g/cm³).

To find mass you can use this equation:

$$M = D \times V$$

To find volume you can use this equation:

$$V = \frac{M}{D}$$