

WATER RACE AND STRETCH

Instructions:

Place a drop of water to fit inside the circle on the sheet

Move the water drop through the maze or along the stretch line

For water race, if the drop separates, go back and collect it then continue. See how long it takes to get through the maze

For water stretch, try to stretch the water drop with a toothpick. Predict how far you can stretch your drop

What's happening:

Water molecules are attracted to each other due to their molecular structure. This is known as cohesion. Water molecules stick together unless the cohesive bonds are weakened, causing them to “break” apart.

THE PARABOLA

Instructions:

Fill up the box to about 1/3 full with water

Carefully spin the box and observe what happens to the water

What's happening:

When the waves on the rotating water surface settle down, the surface forms a curve called a parabola. As the box spins, the water tends to continue moving in a straight line tangent to the circle. However, the box restrains the water and forces it to keep moving in a circle. The water near the edge of the box goes around in one large circle in the same time that the water near the center goes around in a small circle. That means the water near the edge travels faster than the water near the center. The faster an object moves in a circle, the larger the force necessary to hold it in the circle.

SINK OR FLOAT

Instructions:

Try to guess which items will sink and which of them will float

Place items in a dish pan with water

What's happening:

The wooden block, crayon, pencil, and twist tie all float because they weigh less than the water that is pushing upwards beneath them. The metal jar lid may or may not float, depending on how it is placed in the water. The cotton ball floats then sinks as it absorbs water. The plastic comb may sink or float, depending on what kind of plastic it is made from. The golf ball sinks. Boats float on the ocean, you float in a swimming pool and a rubber duck floats in the bathtub. The ability to stay afloat is caused by the balancing of forces - the water pressure pushing up and the weight of an object pushing down. An object floats when the buoyant force of the water directly beneath it is greater than its own weight. It sinks when its own weight is greater than the water's buoyant force.

WEAVING IN AND OUT

Instructions:

Tape one end of each towel to the middle of a pencil

Lay the pencil on top of a glass that contains about $\frac{1}{2}$ inch of water

Add a drop or two of food coloring

Try to guess which towel will absorb better

What's happening:

Water appears to defy gravity as it moves up a paper towel. This is called capillary action and results from water molecules being attracted to the molecules of the paper towel and to each other. However, the molecules can only travel so far before the force of gravity overcomes the attraction of water to itself and to other water molecules.

CARTESIAN DIVER

Instructions:

Fill the tennis ball container with water

Place the eyedropper (the diver) in the water and put on the lid

Press down on the lid to send the diver to the bottom

Stop pressing the lid and the diver will surface

What's happening:

You are seeing the property of buoyancy. An object is buoyant in the water due to the amount of water it displaces or “pushes aside.” If the weight of water that is displaced by an object in water exceeds the weight of the object, then the object will float. As you apply pressure to the container, you apply pressure to the air bubble in the dropper, reducing its size. As the bubble's size reduces, the dropper becomes less buoyant and begins to sink.

