PROJECT WORK

STEAM

Cartesian Diver

The numbers you read and write belong to the decimal number system. This system expresses every number in base 10, meaning each place in a number is occupied by a numeral from 0 to 9. The decimal number system includes negative numbers.

Task

Work in small groups.

The Cartesian diver activity models the principle of buoyancy. It also models changes in vertical distances, as you act on a bottle of water to cause a "diver" to move up or down.

1. The internet offers numerous variations of the Cartesian diver activity. Search several possibilities and select the activity that interests you most.
2. Gather the required materials, which will include an empty 2-liter plastic soda bottle. Use a pen to mark vertical distances, in inches, on the outside of the bottle. Mark the top of the bottle, where its surface is vertical, as zero. Use this vertical number line to observe changes in your diver's position.
3. As you will discover, squeezing and then releasing the water-filled bottle changes the diver's buoyancy. This causes the diver to move down and up. Use negative numbers to represent the diver's positions.
4. Add an extra challenge. Bend the arms of brass fasteners to make small loops. Drop the loops in the bottle, where they will sink to the bottom. Attach paper clips to the diver. Then, squeeze and release to help your diver pick up the fasteners.