



Welcome to MI Kids!



Dear Parent/Guardian:
Thank you for your interest in MI Kids!

These activities are a great way to encourage your child's curiosity and interest in science.

In the upcoming MI Kids event, your child will explore the concept of density by making one of the oldest known scientific toys called a Cartesian Diver. This toy was first described in 1648, and it was named after the French philosopher and scientist, René Descartes. Descartes is most famous for saying, "I think, therefore I am." The Cartesian Diver is a toy that will help your child think about density, and how density relates to sinking and floating. After making this toy, your child will gain an understanding of density as a measure of how heavy something is compared to its size. By playing with the Cartesian Diver, your child can see that if an object is denser than water it will sink, and if it is less dense than water it will float.

If you'd like to delve a little deeper into the science of floating and sinking, here are some books you and your child might enjoy:
<https://www.giftofcuriosity.com/childrens-books-about-sinking-and-floating/>

Looking forward to seeing you soon!

- The MI Kids Team





Have you ever wondered why some things sink in water and some things float? To be able to float, an object must displace its weight in water. Objects float or sink depending on their **density**, or how heavy they are compared to their size. Dense objects such as rocks cannot displace enough water to support their weight, so they sink. Less dense objects like wood, can displace their weight in water and will float.

We are going to explore the idea of density by making one of the oldest known scientific toys called a Cartesian Diver. This toy was first described in 1648, and it was named after the French philosopher and scientist, René Descartes. Descartes is most famous for saying, "I think, therefore I am." The Cartesian Diver is a toy that will help you to think about density.

When you put your diver inside the bottle and squeeze, you will see that there is an air bubble inside of it. When you squeeze the bottle, the air bubble inside of the diver is forced into a smaller space, making it more dense. The more dense the air becomes, the further the diver sinks. When you release the bottle, the air expands and the diver rises to the top.

Activity: Cartesian Diver

- Snip off the bottom of your pipette, leaving an inch.
- Slip a hex nut securely over the remaining portion of the pipette. (If the hex nut is too loose, you can secure it with some electrical tape.)
- Fill your bottle near the top with water.
- Before putting your diver into your bottle of water, you'll want to fine tune your diver's density. To do this, take a small cup of water. Place the diver into the cup of water and squeeze the bulb to fill the pipette with some water. Let it go in the cup. You want it to just barely float. (If the diver sinks in your cup of water, squeeze out some water from the pipette until you get it to barely float.)
- Once you've filled your pipette diver with water (and have a bubble of air inside the top), drop it into your large bottle of water. Screw the cap on securely. The cartesian diver should float in your bottle.
- Squeeze the sides of your bottle. Your diver should go down. When you release the sides of the bottle, your diver should go back up!

Materials for Each Student

- Empty plastic 1-liter or 2-liter bottle with cap
- Graduated pipette
- Hex nut (Depending on the size of your pipette)
- Scissors
- Clear plastic cup

The MI Connection:

All living things need clean water to survive and thrive. Sometimes harmful chemicals pollute water, and scientists help to clean it up. To clean up the pollutants, scientists need to know the density of the chemicals. Knowing the density of the chemicals helps scientists predict how the pollutants could spread through soil and water. At Microbial Insights, the scientists in our lab work with other scientists to find the best ways to clean up the chemicals and make sure that water is safe for people, animals, and plants.

