

# Saturday Morning Science Show: Density and Pressure



DENSITY AND PRESSURE

ISSUE: 4

Saturday Morning Science Show: Density and Pressure

Where Can I See The Show?

- SHOWS WILL AIR ON EHTTV

CHANNEL 2

- EVERY SATURDAY

- TIMES:

6 A.M.

9 A.M.

NOON

6 P.M.

(TIMES SUBJECT TO CHANGE)

YOU CAN ALSO VIEW IT ON THE

DISTRIC WEBPAGE UNDER

ARCHIVE ON DEMAND

## Channel Two Wants You...Come Be A Science Star!

If you would like to be on a future episode and learn about science with cool experiments, please e-mail Mrs. Myers at [myersl@eht.k12.nj.us](mailto:myersl@eht.k12.nj.us) and include your name, homeroom teacher's name and your school.

Your e-mail should be two paragraphs. In the first paragraph, tell what you learned from this month's show. In the second paragraph, tell why you would like to be on the show.



## Come Join Us on a Future Episode and See How Much Fun Science Can Be!

## Density, Density...There Is No Escape From Density

In this episode there will be many experiments you can do at home that involve density.

Density is defined as the mass per unit volume of an object. A more simplified way to think about density is to think of it as the "heaviness" of an object.

For example, a rock is obviously more dense than a crumpled piece of paper of the same size and a Styrofoam cup is less dense than a ceramic cup.

What might not be so obvious is that not all fluids are the same density. For example, if you place a Styrofoam cup in water, it will float because it is less dense.

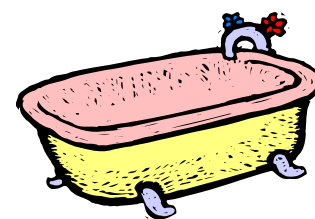
Well, liquids work the same way. Less dense fluids float on more dense fluids...if the fluids don't mix, that is.

In chemistry, the density of many substances are compared to the density of water, which is 1.0g/ml.

If something sinks in water, it has a greater density than water, or 1. If something floats in water, its density is less than 1.

Watch the show to see what fun things you can test to see if they sink or swim.

A bathtub is a great place to test your theories...just ask you parents first.



### Definition Corner

**Mass:** a measure of how much matter is in an object.

**Volume:** the amount of space occupied by a three dimensional object.

## Density Column What Liquids are Less Dense Than Others?



Supplies Needed:  
5 plastic cups  
large clear plastic cup or pitcher  
baby oil  
water (red food color)  
dish soap (blue or green)  
corn syrup  
honey

If you watch the science show you will see that we use many different liquids to make our density column. Although these liquids are not dangerous, they are not all “kid friendly”. This is how you can make a kid friendly density column.

1. Pour four ounces of each type of liquid into a separate cup so they are ready to be poured into the column (pitcher).  
2. Start your column by pouring the honey into the clear container. Now you will pour each liquid **SLOWLY** into the container, one at a time. It is very important to pour the liquids slowly and into the center of the cylinder. Make sure that the liquids do not touch the sides of the cylinder while you are pouring. It’s okay if the

liquids mix a little as you are pouring. The layers will always even themselves out because of the varying densities.  
3. This is the order in which you should pour the ingredients into the container...**SLOWLY**

- honey
- corn syrup
- dish soap
- water
- baby oil

*You now have a density column! Pretty cool!*



## Did You Know?

### SHARK AND FISH SWIMMERS

Which is more dense:  
Helium or Air?

Liquids and solids aren’t the only things that have density. Gases have density too.

Party balloons are often filled with the gas, helium. Helium is less dense than air, so the balloons will float. On our show we have the two helium filled balloons pictured above, shaped like a shark and a fish. The balloons have remote control systems attached to them for fun.

These cool remote control balloons can be purchased at area toy stores or at [www.stevespanglerscience.com](http://www.stevespanglerscience.com)

# Saturday Morning Science Show: Density and Pressure

## Amazing Eggs

Supplies Needed:  
2 eggs  
clear container  
kosher salt

A raw egg will float in very salty water but will sink in plain tap water.

### Why?

Salt water is more dense than regular water.

In order to do this activity, you will need to make a very saturated salt solution by dissolving roughly four tablespoons of salt in about two cups of water. Use pickling or Kosher salt to make a clear salt solution. Table salt may be used, but the solution will be somewhat cloudy due to the additives used to make the salt free-flowing.

Then, gently drop the egg into the water and watch as it sinks through the plain water, only to abruptly stop when it hits the salt water. The egg floats on the top layer of the salt water because the water with salt has a greater density than the water without salt.

*It's an "egg"cellent experiment, and it will impress your friends!!*



**"EGG"CELLENT EGGS**

## Cartesian Divers

Supplies Needed:  
order from  
[www.stevespanglerscience.com](http://www.stevespanglerscience.com)



The "Cartesian Diver" is an excellent way to learn about density and pressure in one activity.

The 2-liter soda bottle provides a diving "tank" for the two divers - a "hook" and a "sinker." The purpose of this science game is to get the hook diver to catch the sinker diver by squeezing the soda bottle.

The pressure you apply to the sides of the bottle changes the density of the hook diver and allows it to float and sink on command. This fun science game does take practice.

You can purchase the kit or complete and return the quiz at the end of this newsletter to be entered into a drawing to win a Cartesian kit.



## Cool Science Stuff Alert...Steve Spangler Science Discount!

Most of the experiments in our show can be duplicated easily at home.

If you would like to purchase the items on our show, you can visit [www.stevespanglerscience.com](http://www.stevespanglerscience.com)

Enter our special code for Egg Harbor Township Families

SATURDAYAMSCIENCE11

and receive 10% off orders of \$50 or more.

THANKS FOR WATCHING!

## Sinking Soda Can Surprise



Soda Can Surprise

Supplies Needed:  
clean plastic fish tank or  
sink  
cans of:  
cola  
diet cola  
lemon-lime soda  
diet lemon-lime soda

Place the soda cans in  
the sink or clear plastic  
fish tank. Which ones  
float? Which ones sink?

This demonstration is an  
excellent way to learn  
about density. The  
general rule is that the  
diet sodas will float and  
the non-diet sodas will  
sink. This demonstrates  
the difference between  
**mass** and **volume**.

**Mass** refers to how  
much *stuff* exists within  
an object. If one object  
is heavier than another

object, it has more mass.  
The sugar has much  
more mass and volume  
than the artificial  
sweetener, aspartame,  
which is used in many  
diet sodas.

Try this at home:  
How will water affect  
the density/buoyancy of  
the soda cans?  
What about salt?

# Nutrition Label

LOOK...

If you look at the nutrition  
label on a food or drink  
product, you can see what is  
“in” the product.

This soda can has 49 grams  
of sugar...that would be  
about 45 packets of sugar!

Nutrition Facts	
Serving Size 1 can	
Servings Per Container 12	
Amount Per Serving	
Calories 200	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 45mg	2%
Potassium 0mg	0%
Total Carbohydrate 49g	10%
Dietary Fiber 0g	0%
Sugars 49g	
Protein 0g	
Vitamin A 0%	Vitamin C 0%
Calcium 0%	Iron 0%
*Percent Daily Values are based on a 2,000 calorie diet.	
www.nutritionpedia.com	
Image copyright Nutrition Systems, LLC.	

## Hey Kids...

Here are two ways to win this month's prize:

1. Print out the chart below & circle the liquids that are more dense than water.
2. Print out the quiz on the next page and answer the questions.

Mail one or both of your quizzes and answers to :

Mrs. Kelli Wenzel  
25 Alder Avenue  
Egg Harbor Township, NJ 08234

Please include:

your name

**your homeroom teacher's name**

your school's name

**Correct quizzes will be entered into a drawing for a prize... a Cartesian Diver Kit!**

There will be one winner for each quiz.

Material	Density
Maple Syrup	1.37
Honey	1.42
Baby Oil	.83
Vegetable Oil	.92
Ice Cube	.92
Milk	1.03
Dawn Dish Soap	1.06
Light Corn Syrup	1.33
Rubbing Alcohol	.79
Lamp Oil	.80

Good Luck

&

Thanks for Watching!

- 1) \_\_\_\_\_ are anything that flows.
  - A. solids
  - B. fluids
  - C. mass
  - D. gravity
  
- 2) Which word means how much *stuff* is in an object?
  - A. fluid
  - B. solid
  - C. mass
  
- 3) Which type of soda floats in water?
  - A. regular soda
  - B. diet soda
  
- 4) Liquids and solids aren't the only things that have density. Gases have density too.**
  - A. true
  - B. false
  
- 5) When the students blew air between the balloons, what happened?
  - A. they went apart
  - B. they came together and "kissed"**
  
- 6) If an object sinks in water it has a density of \_\_\_\_\_?
  - A. less than 1g/mL
  - B. more than 1g/mL

Thank you to all of our hosts, teachers, administrators and community members that make this show possible.



Artwork by: Ms. Benton