

Wikijunior's Science Adventure:

The Ultimate Fun Experiment Guide



Wikijunior:Big Book of Fun Science Experiments



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Hello and Welcome to the Big Book of fun Science Experiments for Early Grades!

This book is about science experiments that you can do in the home and experiments that you can nag your teacher to do in school. These experiments are easy to do and help in understanding various things about science for young children.



Contents

Slime recipes

Yucky gooey slime! Isn't it just great?! We love it!
Oobleck – is it a liquid or a solid?

Red cabbage indicator

Red cabbage indicators are great for showing if something is an acid or base. It's that exciting!

Pinhole Camera

Want to be able to see the sun and solar eclipses clearly without hurting your eyes? Then this is for you!

Raisin Dance

Make those raisins dance. And the best bit is - after you finish your experiment, you can eat the raisins!

How A Bath Fizzer Works, and How To Make One

Learn how that fizzer works, and make one with stuff you can get from your kitchen or a craft store. Children may enjoy making the salts in this chemistry experiment.

Slime

Do you like making slime? We do.

Here are some simple experiments of how to make some:

1. Place 2 tablespoons of PVA ([polyvinyl acetate](#)) glue in a zipper-type plastic bag or bowl and add an equal quantity of water.
2. Add 1 or 2 drops of food colour, if you want.
3. Add 1/2 teaspoon of saturated borax solution. (Borax can be bought in a pharmacy, or nag your science teacher to do this at school).
4. Squeeze the bag to mix the contents or use a spoon or your fingers if using a bowl.
5. When the slime has mostly formed, reach in and take out the slime. Don't be shy, it will not hurt you!
6. Knead the slime to make it smooth.
7. Puuuuuurfect!!! You have made your slime! It should be a bit like putty.

Options: use clear PVA glue and glitter for a different look.

Add shaving cream for fluffy slime.

Add poly styrene balls for some texture.



Another type of slime you can make, using cornstarch and water, is [Oobleck](#).

Oobleck

Oobleck, Goo or Goop is a strange substance that has some of the properties of a liquid and a solid at the same time. Substances like this are called **non-Newtonian fluids**, because they do not follow the normal rules of solids and liquids. Newtonian solids, like wood or ice, hold their

shape. Newtonian liquids, like oil or water, usually take the shape of the container they are in. Non-Newtonian fluids like Oobleck are sometimes liquids and sometimes solids.

If you have ever melted chocolate without stirring it, you will notice that the squares of chocolate hold their shape until you stir them up. Melted chocolate is also a non-Newtonian fluid.

1. The Experiment

1.1 Safety

As with all experiments, you should talk to an adult before trying to make Oobleck. You may need permission to use the ingredients.

Oobleck is safe to touch; however, it can be very messy. You should wear an apron to keep your clothes clean. If you get Oobleck on your clothes or on the floor, you can easily clean them up with water.

1.2 What You Need

Water
A cup of cornstarch
A bowl
A spoon
That's it, isn't that easy!

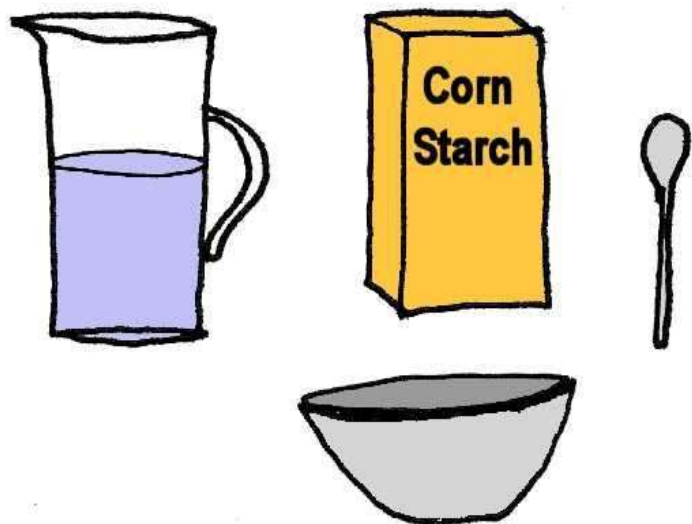
1.3 Instructions

Put about a cup of cornstarch into the bowl.
Pour about a cup and a half of water into the bowl and stir.

All the cornstarch should be covered in the water. There should be no dry cornstarch visible. If there is dry cornstarch, add a *tiny bit* more water and stir again. Keep adding a tiny bit of water and stirring until all the cornstarch is covered in water. The mixture should look wet but be difficult to stir, as if you are trying to stir a solid.

Dig in!

Note: If your oobleck starts getting too dry, just add a little more water and stir it again.



2. Things to Try

Pick up a handful of oobleck and squeeze it in your fist. Does it feel like a solid or liquid?

Now open your hand and hold it over the bowl. What happens? Now is the oobleck a solid or a liquid?

When is the Oobleck a solid? When is it a liquid?

Find a small object such as a plastic toy and attempt to float the object on the Oobleck. Can you do it?

3. What is Happening?

The cornstarch is suspended in the water as a starch and water mixture. A simplified explanation is: the starch molecules are long chains of atoms. When you let them move slowly, they can slide past each other. When you squeeze or hit them, they get tangled and cannot move.

However, scientists are still investigating strange substances like Oobleck. There are still many questions to answer!

Red Cabbage Indicator

Safety

As with all experiments, you should always get help from an adult. Some acids and bases can hurt your skin, so you should wear:

- Rubber gloves
 - An apron
 - Safety glasses (regular glasses, r sunglasses or swimming goggles are okay if you don't have safety glasses).
- If you get chemicals on your hands or gloves, do not touch your eyes! Wash your hands after completing the experiment.

What You Need

- A red cabbage
- A knife or grater
- A medium sized bowl
- At least 4 small cups
- Chemicals to test such as lemon juice and baking powder or soda
- coffee filter

Step 1

- Have a parent, guardian, or teacher help you cut or grate between a quarter or a half of the cabbage into small pieces.
- Put the cabbage into a medium sized bowl.
- Pour water over the cabbage. You can use cold water, warm or boiling water. Boiling water will work the fastest, but only boil the water if you have an adult to help you.
- Let the cabbage sit in the water for a while (30-45 minutes), until the water turns a deep purple colour. You can stir the mixture to speed up the process.

Step 2

- Using a coffee filter or a fine sieve, strain the juice into a cup. It should be deep bluish purple in colour.
- Pour equal amounts of the strained liquid into small plastic cups. These are your 'test tubes' in which you will test different chemicals.



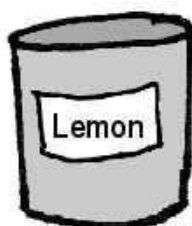
Step 3

- Set one of your cups ('test tubes') aside. This is your control. It already contains water, which usually has a pH of 7. This means that water is neither an acid nor a base.
- Assemble some testing chemicals (some good ones to try are below).

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Some Chemicals to Test

- Lemon juice
- Baking powder or soda
- Milk
- Yogurt
- Vinegar
- Soap



- Label each cup with the name of the test chemical each cup will contain, so you will remember what you put in each cup.

- Which chemical do you think is the most acidic?

Step 4

- Pour, drip or spoon a small quantity of each test chemical into the cup labeled with its name.
- Observe the change in colour of the juice. If the juice turns reddish, the chemical you are testing is an acid. If the juice turns bluish, the chemical you are testing is a base. If it stays the same, the chemical is neutral, like water.

Observations

- Arrange your cups from red, to pink, to violet, to purple, to blue, and to green. You might not have all of these colors, but that's okay.
- The cup that is most red is the most acidic. The cup that is the most blue or green is the most basic (alkaline). Which chemical is the most acidic? Which is the most basic (alkaline)?



Pinhole Cameras

You will need these things:

- A Long Box (The longer the box the bigger the picture will be)
- A Pin or Needle
- Some Glue
- Some Tin Foil
- A Ruler
- A Pair of Scissors

How to Make the Pinhole Camera

Step 1: Cut a square hole in the top of the box on the smaller end that is about 1 inch by 1 inch (2.5 by 2.5 cm) (use your ruler!)

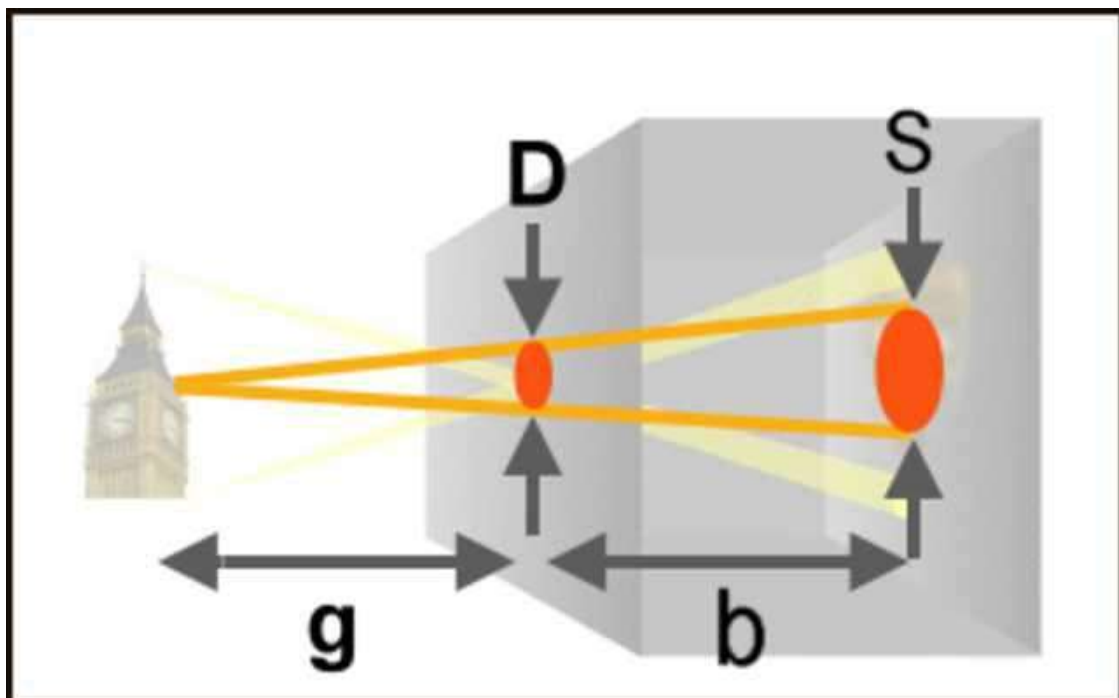
Step 2: Draw a line around the hole with some glue, then put a square of tinfoil on top so that the hole is covered.

Step 3: Once the glue is dried, poke a tiny hole in the tin foil with the pin.

Step 4: Cut a hole on the long side of the box so that you can see the bottom of the inside of the box.

How to Use the Pinhole Camera

Next time you know there is going to be a solar eclipse, point your pinhole camera towards the sun. The light will shine in through the pinhole and out onto the bottom of the box. Looking right at the sun can hurt your eyes, so using a Pinhole Camera is a fun and safe way to watch eclipses.



Raisin Dance

What you need to do

Step 1

Get a clear drinking glass (or beaker). Fill it with a bubbly and clear drink like Sprite or sparkling water.

Step 2

Get raisins and add them slowly and keep putting them in the beaker.

What Happens?

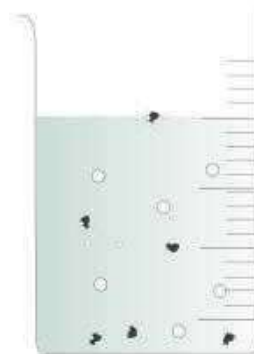
The raisins rise up to the top, then fall down, and then rise to the top again. It's like they're dancing.

The Science Bit

The bubbly drink that you used is packed full of a gas called Carbon Dioxide (CO₂). There's so much CO₂ that it bubbles out of the drink. That's what makes it fizzy.

When you drop the raisins in, some of the bubbles stick to the raisins. Since the bubbles are trying to rise up out of the drink, they pull the raisins along for the ride. Once a raisin gets to the top, the bubbles come out of the drink and pop. Since the raisin doesn't have bubbles holding it up anymore, it falls back down where the process starts all over again.

Don't forget to clean up! You can still eat the raisins and drink the soda.



Bath Bomb

A **bath fizzer** or *bath-bomb* is a mixture of perfume or scent mixed an alkaline and an which reacts in water.

Ingredients

You will need:

- Sodium Bicarbonate
- Citric Acid
- Scented powder, eg vanilla beans, cinnamon, lavender

Look at the ingredients on baking powder: These usually just contain sodium bicarbonate which may be written as NaHCO_3 but may also contain lemon juice or citric acid (H_8O_7). These are the alkaline and acid you need. Citric acid is the main ingredient of fizzy lemon or orange drink crystals and bath salts. In Europe, citric acid is often listed as as E330, sodium bicarbonate is E500.

Some pharmacists stock boxes of pure crystalline sodium bicarbonate and refined citric acid crystals, but these things are cheaper and more easily sourced simply by reading the labels on various powder products sold in ordinary shops. The wanted product should be the main (ideally only) ingredient, but expect to find colour, flavour and texture products mixed.

Experiment

The 'best' mixture will depend on the exact nature of the products you can find, but a good starting point is an equal mixture of both ingredients, which we call 1:1 ratio of 50%. You may have try different mixtures: 1:1, 1:2, 1:3, until the most lively reaction occurs, particularly with baking powder, which often contains rice flour.

Swirl the two dry powders together and then, with clean wet hands, squeeze them into a ball. The moisture on your hands will react with the outer layers, which will feel funny and form a sort of shell. Don't do this if you have cuts or grazes, because it can hurt. Once the ball has set, place it on a dry surface, wash your hands thoroughly and dry them. Getting just the right moisture to make the ball 'set' will require a bit of trial and error!

Now take some water that is as hot as is comfortable for a bath, drop the ball into it, and watch what happens!

Finally try adding some aromatic cooking powder such as dried lavender, vanilla or nutmeg, and some food colouring. That's it!

