5 Experiments in 5 Minutes

Quick and Easy Science

Crystal Chatterton

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(with more to come soon)

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Introduction

Gather your young scientists together and get ready for a five minute science extravaganza!

Make raisins dance, go fishing for ice, and create colorful, swirling art. Drop exquisite color bombs and squeal with anticipation waiting for a baggie to explode!

5 Experiments in 5 Minutes contains quick and easy science fun for kids ages 3-10. All of the activities are suitable for the classroom or at home, for individuals, small groups, or large classroom demonstrations alike.

Each activity includes a list of supplies, thorough directions, and a brief explanation of the science behind the experiment. Also included is a no-prep printable worksheet that is meant to help older students process the information they learn during each science experiment. (The worksheets may be a bit advanced for preschool and kindergarten students.)

At the end of each experiment you will find three "Extensions to Try." These are intended to build on the scientific concepts taught in each activity and to encourage children to think more deeply about what they see.

Happy Learning and HAVE FUN!

Supply List

Prep made simple! All of the activities in this packet can be completed with the following supplies:

Kitchen and Pantry Ingredients

- Milk
- Food coloring
- Vinegar
- Baking soda
- Water
- Vegetable oil
- Ice cubes
- Table salt
- Clear carbonated drink like seltzer water or Sprite
- Raisins

Kitchen Equipment

- Plate or baking sheet
- Liquid dish soap
- Plastic zip-top baggie
- Clear cup or vase
- Measuring cups and spoons

Craft Supplies

- Toilet paper
- String or yarn

Magic Milk

Engage your student's creativity while creating scientific art!

Supplies

- Milk
- Plate or baking sheet
- Food coloring
- Liquid dish soap

Directions

- Pour a thin layer of milk into the dish.
- Squeeze a few drops of food coloring onto the milk.
- Carefully drip one drop of liquid dish soap in the center of the colored milk. Alternately, dip one end of a toothpick into the liquid dish soap and then touch the colored milk with it.
- Watch the color erupt and scatter like fireworks in the sky!

Explore

If you love experimenting in the kitchen, check out our growing collection of over 20 jaw-dropping kitchen science experiments!



The Science Behind What You See

Dish soap disrupts the surface tension of milk. This means that when dish soap is added to milk the surface molecules spread out and the colors explode, as if by magic.

After adding dish soap the milk keeps erupting for several seconds. This is because each molecule of soap wants to grab onto one molecule of fat in the milk. With millions of molecules trying to find a partner all at once, the mixture gets all stirred up!

Extensions to Try

- Compare different kinds of milk to see how it changes the effect. How does skim milk behave differently from liquid cream?
- Try doing this experiment in other liquids like oil or water.
- Instead of using dish soap try dripping other liquids into the milk. Do they produce the same effect? Maple syrup, corn syrup, shampoo, and hand soap might be some fun options to start with.

Name: _____

Magic Milk

Draw a Picture of your Magic Milk:

1. Explain what happens when dish soap is added. Why?

_____

_____

_____

2. If water is used instead of milk, what do you predict will happen?

_____

_____

Exploding Baggie

Combine two common kitchen ingredients to make an exciting reaction in a bag!

Supplies

- Plastic zip-top baggie
- ½ cup vinegar
- Toilet paper
- I tablespoon baking soda

Directions

- Head outside where it's alright to make a little mess.
- Measure vinegar into the baggie.
- Place baking soda on a couple squares of toilet paper. Fold and twist the tissue into a little pouch around the baking soda.
- Quickly drop the baking soda pouch into the baggie and zip it up.
- Give the baggie a few shakes, drop it on the ground, and take a few steps back.
- Watch as the baggie expands and stretches until it finally pops open!

Explore

Keep the baking soda and vinegar out to make a fizzy pendulum painting and a simple fire extinguisher!



The Science Behind What You See

When baking soda and vinegar are mixed they react to produce carbon dioxide gas. As more and more carbon dioxide fills up the baggie, the pressure inside increases. Once the pressure is so high that the baggie can't contain it any longer, the baggie pops!

Extensions to Try

- Vary the amounts of baking soda and vinegar to see how it affects the speed and/or intensity of this reaction.
- Compare how the reaction is different when using a quart-size baggie versus a gallon-size one.
- Substitute baking soda and vinegar for water and an Alka-Seltzer tablet to see how it compares! (See this post on how to make film canister rocket fireworks to learn the science behind dissolving an Alka-Seltzer tablet in water.)

Name: _____

Exploding Baggie

Draw a Picture of the Baggie Before and After Adding Baking Soda:

Before:	After:

1. Explain why the baggie popped open.

_____

_____

_____

2. What gas is made when baking soda and vinegar mix together?

_____

_____

Color Bombs

Learn about density and miscibility in this simple and colorful experiment!

Supplies

- Clear cup or vase
- Water
- Vegetable oil
- Food coloring

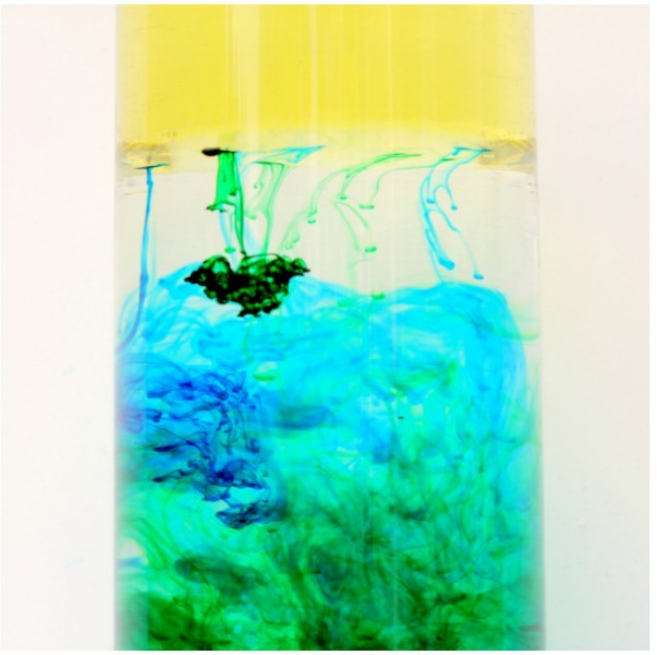
Directions

- Fill the container about ⅔ full of water.
- Add a thin film of vegetable oil.
- Add 1-5 drops of food coloring. The food coloring will bead up and sit in the oil layer.
- Wait for a minute or two for the food coloring to drop from the oil layer down to the water.

Explore

After watching Color Bombs explode, make your own lava lamp or try another cool water and oil experiment using clear oil!





The Science Behind What You See

Oil is less dense than water so it floats on top. Oil and water are made of very different chemical bonds, which is why the two don't mix. (Water is made of polar chemical bonds and oil is made of nonpolar chemical bonds.)

The food coloring only dissolves in water since it is water-based. When you drop food coloring into the cup it beads and sits in the oil layer until the pull of gravity makes it drop down to the water layer, creating the exciting "bomb" effect.

Extensions to Try

- Is there anything you can do to this mixture to make the oil and water layers mix together?
- Vary the temperature of the water and see if the food coloring does anything different in hot water versus ice water.
- Use different kinds of oil (vegetable, olive, mineral, melted butter) and different clear liquids (carbonated soda, lemon juice, vinegar) to see what happens.

Name: _____

Color Bombs

1. Is oil more dense or less dense than water? How do you know?

_____

_____

2. Explain what happens in this experiment.

_____

_____

_____

3. Why doesn't food coloring dissolve in oil?

_____

_____

_____

Draw It!

Fishing for Ice

Do a simple science magic trick using ice, salt, and water!

Supplies

- Cup of water
- Ice cubes
- String or yarn
- Table salt

Directions

- Place a few ice cubes into a cup of water.
- Lay the string over the top of the ice cubes, trying to get it to touch each one.
- Sprinkle some salt onto the top of the ice cubes and string.
- Wait one minute. Gently pull the string out of the cup and see what you've caught!

Explore

Use the power of salt and ice to make tasty treats like homemade ice cream and fruity ice slush!

The Science Behind What You See

Salt melts tiny tunnels into the ice. Since only a little bit of salt is used in this experiment, the water around the ice quickly freezes again, which freezes the string to the ice. For a few moments, the ice sticks to the string!

Extensions to Try

- Experiment using different kinds of salt. Instead of table salt try Epsom salt, baking soda, or rock salt and see if they have the same effect.
- Vary the temperature of the water. Can you catch ice cubes better in colder or warmer water?
- What happens if salt is added before the string is laid across the ice cubes?

Name: _____

Fishing for Ice

Draw It!

1. What happens when salt is sprinkled on top of ice?

_____

_____

2. How does the string pick up the ice?

_____

_____

_____

3. What are some more ways to use salt and ice together?

_____

_____

Dancing Raisins

Watch raisins dance up and down all on their own!

Supplies

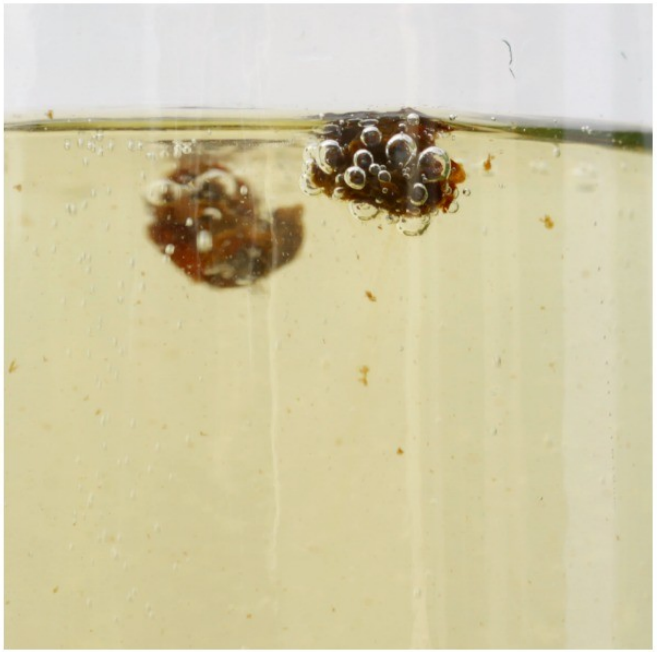
- Clear cup or vase
- Clear carbonated drink like seltzer water or Sprite
- Raisins

Directions

- Fill your cup with the carbonated drink of your choice.
- Grab a handful of raisins and drop them into the cup. Watch as they float to the surface and then sink back down, as if they are dancing!

Explore

Continue experimenting in the kitchen by testing how different kinds of salts affect water density or by making a Skittles rainbow!



The Science Behind What You See

The bubbles in the carbonated drink (carbon dioxide) attach to the wrinkled surface of the raisins. This makes the raisins float to the surface of the liquid, as if they are wearing little life preservers. The bubbles pop at the surface, making the raisins sink back down to the bottom of the cup again. This effect will continue for several minutes!

Extensions to Try

- Compare different carbonated drinks to see which one makes the raisins dance the most!
- Try different dried fruits like dried cranberries or prunes. Do they dance like the raisins do?
- Place the raisins directly into the soda pop bottle and close the lid tightly. What happens?

Name: _____

Dancing Raisins

Draw It!

1. What happens when raisins are added to soda pop?

_____

_____

2. Why do the raisins dance up and down?

_____

_____

_____

3. What do you predict would happen if you put raisins into a cup of water instead of soda?

_____

_____

Glossary

Carbon Dioxide: A colorless, odorless gas that is made of one carbon atom and two oxygen atoms. (pages 11 and 20)

Chemical Reaction: A process by which one or more substances is converted into a different product. (page 11)

Density: The degree of compactness of a substance. Materials that are less dense float on top of more dense substances. (page 14)

Miscibility: The ability of two substances to be mixed in any ratio without separation into two layers. Oil and water are immiscible because they do not mix. (page 13)

Molecule: A group of atoms held together by chemical bonds. (page 8)

Nonpolar Chemical Bond: Bonds between atoms or molecules in which electrons are shared equally. Oils, fats, and waxy materials like crayons are made of nonpolar chemical bonds. (page 14)

Polar Chemical Bond: Bonds between atoms or molecules in which electrons are shared unequally, creating partially charged positive and negative areas. Water and alcohol are made of polar chemical bonds. (page 14)

Pressure: A physical force exerted when one object pushes or pulls against another object. The objects can be solids, liquids, or gases. (page 11)

Surface Tension: The force exerted along the surface of a fluid that causes it to form into droplets. (page 8)

About the Author

Crystal is a homeschooling mom of three and the author of AWESOME SCIENCE EXPERIMENTS FOR KIDS.

After trading an academic career in chemistry to stay home with her kids she launched The Science Kiddo website to focus on sharing her love of science with her children. She writes about science, coding, engineering, and math activities for kids.

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