

How to Make Your ZOOMerang

You can print out your ZOOMerang and make it into a little booklet.

Here's how:

- Print all the ZOOMerang pages.
- Cut out each page along the dotted lines.
- Tape pages 1–6 together from end to end so that you have a long row.
- Tape pages A–F together to make a second long row.
- Lay one row face down on a table and put some glue on the back of the pages.
- Place the second row on top of the first row. The printed part of the second row should face you.
- Smooth out the glue with your hand.
- Let it dry and then fold your ZOOMerang where the pages join together.



What You Need

- scissors
- tape
- glue

Voilà!



Yeast

Did you know
that yeast is alive?

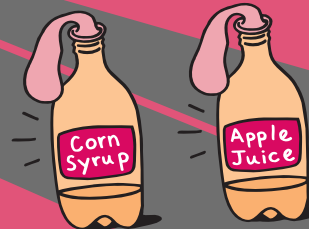
What You Need

- 3 half-liter plastic bottles
- warm water
- corn syrup
- apple juice
- water
- marker
- 3 packets of yeast
- 3 balloons

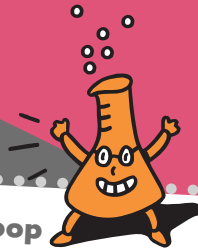
Pour about an inch of warm water into each bottle. **Add** a different liquid (corn syrup, apple juice, or water) to each bottle until the bottle is about $\frac{1}{4}$ full.

Label each bottle. **Put** a packet of yeast in the first bottle and quickly **cover the top** with a balloon. **Repeat** with the other two bottles. Then gently **shake** each bottle. **What happens** after 5 minutes? Which balloon is the **biggest** after **30 minutes**?

Now it's time to **experiment**. What happens if you **leave** the bottles **overnight**? Or, what happens if you **use different liquids**, like grape juice or cola? **Check** with an adult before you test a new liquid. Choose **one thing** to change (that's the variable), and **predict** what you think will happen. Then **test it** and **send** your results to ZOOM at pbskids.org/zoom/sendit



Sent in by J.J. of Thousand Oaks, CA



Science Scoop

The yeast inside a packet is **dormant**. This means that it is **inactive**. Yeast becomes **active** when you add two things: **heat** (warm water) and **food** (sugar). When yeast is active, it produces a **gas** called **carbon dioxide**. You can't see this gas. But you can tell that it's there because it **fills** the balloons. Which balloon inflated the **most**? Did one balloon **not inflate** at all? What do you think was **missing** from that bottle: heat, food, or both?



2



Investigate This!

What makes **bread rise**? It's the **carbon dioxide** produced by yeast. Check it out by baking some bread. Ask a parent if you can make

Bread in a Bag

(pbskids.org/zoom/cafe).

Then **look** closely at a slice of bread. Do you notice **small holes**?

Bubbles of carbon dioxide make these holes.

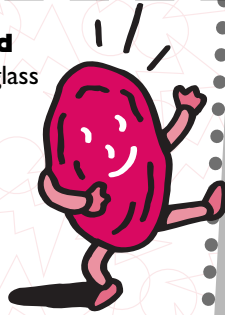


Dancing Raisins

3

What You Need

- tall, clear drinking glass
- raisins
- club soda that has lots of bubbles
- other foods (like a corn kernel or a chocolate chip)
- other liquids (like water or cola)

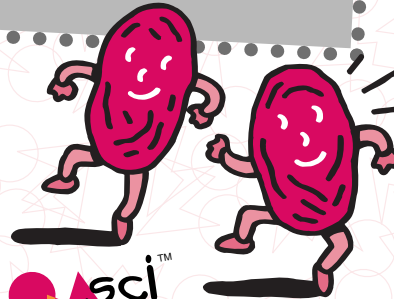


Pour the club soda into the glass.

Drop in half a raisin. **Wait** 20 to 30 seconds. **What happens** to the raisin? What is it about the raisin—its **weight**, its **shape**, its **size**—that makes this happen? Try dropping in something else, like a **corn kernel** or a **chocolate chip**. Do they **float** to the top? What happens if you use another kind of liquid, like **water** or **cola**? Does the raisin still float to the top?

Science Scoop

What makes the raisin **float** to the top? The **bubbles**! The bubbles **stick** to the sides of the raisin and make it more **buoyant** [BOY-ant]. Buoyant means that something **floats** easily. The bubbles make the raisin float the way a **life jacket** makes a person float.



Sent in by Mary-Elizabeth G. of Tallasee, AL

**Start by being smart!
Check out these safety
rules before you do
any activity.**

Science Safety Rules

- **Ask** an adult for **permission** before starting an activity.
- **Ask** before **using materials** you find in the kitchen.
- **Do not eat** or drink while experimenting.
- **Ask** for help when using **scissors** or a **knife**.
- **Ask** before using the **oven** or **microwave**.
- If an activity is messy, **cover your workspace** with newspaper or go outside.
- **Wash** your hands after experimenting.



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Parents:
Visit **ZOOMtoo** for tips on using
ZOOM activities with your kids
(pbskids.org/zoom/too).

Since you wrote to us,
we're writing to **you!**



Look inside for science you can do in your kitchen!

ZoerangTM



The Arthur
Vining Davis
Foundations



Kitchen Chemistry



Did you know that a lemon can **power** a clock, **launch** a rocket, and **shine** a penny? Or that the juice from a red cabbage **changes colors** when you mix it with different liquids?

You can do lots of fun **science experiments** right in your **kitchen**. Here are some of our **favorites**. You can find **more** activities at the ZOOMsci home page at pbskids.org/zoom/sci. Have fun!

What are acids and bases?

You come across **acids** and **bases** every day. Lots of vitamins in foods you eat are acids, like **vitamin C**.

Lots of cleaning products are bases, like **soap**. How can you tell if something is an **acid** or a **base**? You can add it to **red cabbage juice**!

Red cabbage juice **changes color** when it's mixed with an acid or a base. The juice of a red cabbage is **purple**. When it's mixed with a **base**, like baking soda, the cabbage juice turns **blue**. When it's mixed with an **acid**, like vinegar, it turns **red**. Red cabbage juice is called an **indicator**. An indicator tells you whether something is an acid or a base by **changing color**.

Cabbage

What You Need

- red cabbage, cut in half
- grater
- large bowl
- measuring cup
- cold water
- strainer
- small bowl
- 3 small paper cups
- spoon
- vinegar
- baking soda
- other liquids (like lemon juice or dish detergent)

Sent in by Jacob F. of Opelousas, LA

B

Juice Indicator

First, **make some red cabbage juice**. **Peel** off the **top** layer of cabbage leaves. Have an adult **cut** the cabbage in half for you. **Ask** for permission to use a grater and **grate** the cabbage into a large bowl until you have about 1 cup. **Cover** the cabbage with **cold water** and let it sit for at least **45 minutes**. Then **strain** the juice into the small bowl.

Color of the control: _____

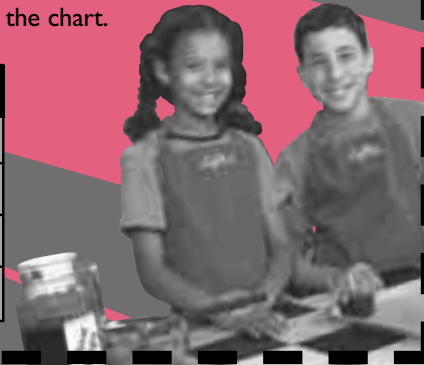
Test Item	Color	Acid, Base, or Can't Tell
Vinegar		
Baking soda		

Put two spoonfuls of cabbage juice in each cup. **Set** one cup aside. This is your **control**. You won't add anything to this liquid.

What color is the control? **Record** your answer above the chart.

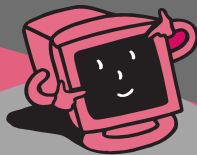
Add a spoonful of **vinegar** to the second cup of cabbage juice and **stir**. **What happens?**

Add a spoonful of **baking soda** to the third cup and stir. **What happens?** **Record** your results on the chart.





Now it's time for you to **experiment**. Find **other liquids** in your kitchen to test, such as lemon juice or dish detergent. It is very important to **check with an adult before testing liquids**. Some liquids found in the kitchen, like cleaning products, are dangerous. Predict whether the liquids are **acids** or **bases**. Then use the cabbage juice indicator to **find out**.



If you have an idea for a science activity, send it to ZOOM at pbskids.org/zoom/sendit

D

Investigate This!

How can you use an acid and a base to **launch a rocket**? Find out by making a **Lemon Juice Rocket** (pbskids.org/zoom/sci). Then keep experimenting to find out which liquids make the rocket fly the **farthest**.



If H₂O is water, what is "H₂O₄"?

Drinking.

Sent in by Angela of IL

Polishing Pennies

E



Are acids or bases better at cleaning pennies?

What You Need

- 6 dull pennies
- 5 paper cups
- lemon juice
- spoon
- other liquids (like milk or apple juice)



Put a penny in each cup. You'll have **one penny** left over. This is your **control**. You **won't change** this penny so you can compare it to the pennies you do change.

Pour some lemon juice into the first cup. Make sure that the penny is completely **covered**. **Wait** about five minutes. Then **remove** the penny. What does it **look** like? **Compare** this penny's color to the control penny's.

Keep experimenting to find the best way to polish a penny! Find **other liquids** to test, like milk or apple juice, and **ask an adult** if you can use them. Add the **same amount** of each liquid to the remaining cups. **Wait** about 5 minutes. Then take a **look**.

Which liquids make the pennies **shiny**? Are these liquids **acids** or **bases**? Use the **cabbage juice indicator** to find out!

Sent in by Adriana F. of Prescott, AZ





Science Scoop

A new penny is partly made from bright, shiny **copper**. But after a while, it loses its shine. Why? Because the **copper mixes with oxygen** in the air and makes a coating of **copper oxide**. When you put a penny in **lemon juice**, the dull coating of copper oxide goes away. That's because lemon juice is an **acid**. Acids can **dissolve** copper oxide.



F



**Why didn't
the scientist
have a
doorbell?**

She wanted to win
the "NOBEL" Prize.
Sent in by Marie of CA