Ready. Steady. Science!

A collection of fun and creative science experiences using household items for ages 4-11.

Adult supervision is recommended for young learners.

Activity 1 – Grow your own rainbow

Time: 15 minutes
Skills: observing and performing simple tests

Activity 2 – Make a bouncy egg

Time: 5 minutes to set up, then leave for 24 hours
Skills: observing, performing simple tests and recording data

Activity 3 – Push the pepper

Time: 5 minutes
Skills: observing and performing simple tests

Ages 4-11

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BP Educational Service provides hundreds of free teaching resources for ages 4-19. Check them out at https://bpes.bp.com/

Grow your own rainbow

Ages 4-11

You will need:

- kitchen roll
- a dish of water
- water-based felt tip pens
- optional: paper clip and thread or string

Method

1. Cut a rainbow shape from kitchen roll.
2. Use the felt tip pens to colour a 2-3cm rainbow at each end.
3. Attach the paper clip and thread to the top of the rainbow. Use this to hold the rainbow up.
4. Dip the ends of the rainbow into the dish of water.
5. Watch!

What's the science?

Kitchen towel is an absorbent material. This means it soaks up liquids easily. It can do this because it has lots of very tiny holes in it.

When water touches the towel, it doesn't just wet the part of the towel it is in contact with, but it moves though the towel, filling the holes as it goes.

This happens because the water sticks to itself and to the fibres in the paper. When something sticks to itself, we call it cohesion. When something sticks to another material, we call it **adhesion**.

Gravity is a force that pulls things towards the ground. In this experiment, the water travels up the kitchen towel, against gravity.
We call this **capillary action**.

Let's investigate!

Try different types of paper and pens. Do they all make great rainbows?

Can you explain why?

Get talking!

Show your family how to grow a rainbow. Ask them if they can explain the science. If they can't, you can tell them!

Talk about removing pen stains from your clothes. Do all pens wash easily out of clothes?

Find out more

Go online to find out how real rainbows are made. Make a mini-book about rainbows and read it to your family.

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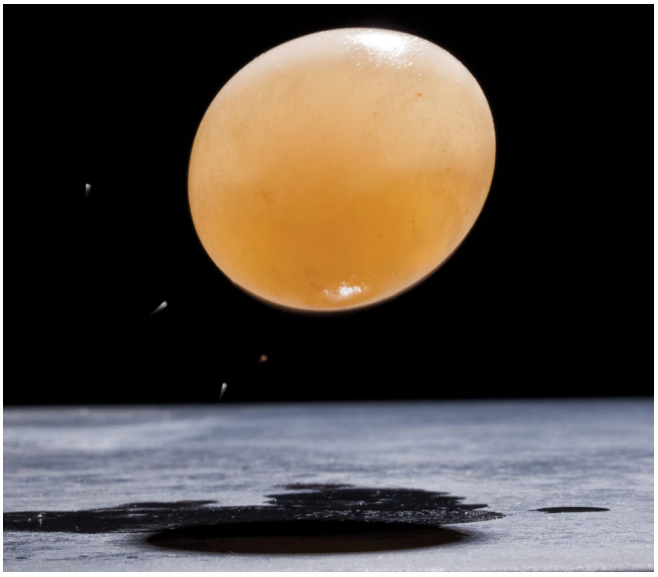
Make a bouncy egg

Ages 4-11



You will need:

- 1 egg (raw)
- white vinegar
- 1 tall glass or jar
- Optional: an adult to help

Method

1. Place the egg into the glass or jar.
2. Cover the egg with vinegar.
3. Leave the egg in the vinegar for 24 hours.
4. Check back on your egg a few times to see if anything changes.
5. After 24 hours, carefully take the egg out of the vinegar. Gently rub the outside of the egg to remove the shell.
6. Drop the egg from a very small height and see it bounce!

What's the science?

The shell of an egg is made from a material called calcium carbonate. White vinegar is mainly water but it also has a substance in it called acetic acid.

The calcium carbonate in the shell **reacts** with the acetic acid to make a substance called calcium acetate, as well as water and a gas called carbon dioxide. You may have seen the bubbles of carbon dioxide gas appearing on the surface of the shell when it was in the vinegar.

When all of the shell has reacted with the vinegar, the membrane that is normally inside the shell, is left behind. This is what makes your egg bouncy.

Science words

React: when two substances combine and cause a chemical change in each other

Let's investigate

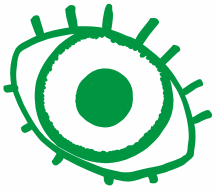
Shine a torch or light at your bouncy egg. What can you see?

Lemon juice is an acid. Can you make a bouncy egg using lemon juice?

Drop your bouncy egg into a sink from a height of about 2cm.Then drop it from different heights. What height can you drop your egg from, before it breaks?

Get talking!

Show your family your bouncy egg. Ask them to work out how you made it. Explain the science to them.



Find out more

Go online and find out about the parts of an egg. You should be able to see some of these when you shine a torch at your egg. Challenge your family to name the parts of the bouncy egg.

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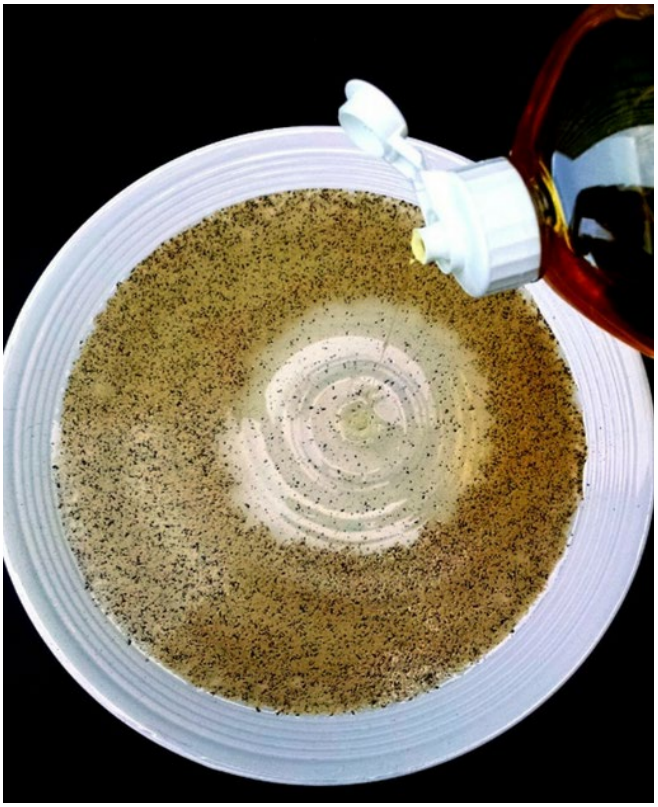
Push the pepper

Ages 4-11



You will need:

- ground black pepper
- a shallow plate
- water
- washing-up liquid or a bar of soap

Method

1. Put some water onto the plate so that it is about 2cm deep.
2. Cover the surface of the water with a layer of pepper.
3. Dip your finger into the pepper. Does anything happen?
4. Now, dip your finger into some washing-up liquid or touch a bar of wet soap.
5. Touch the pepper again. What happens this time?

What's the science?

This experiment is all about **surface tension**.

Water molecules hold on to each other very tightly. We call this **cohesion**. At the surface of the water, the molecules hold on even more tightly and make what looks like a 'skin' on the top of the water. We call this **surface tension.**

Surface tension holds up the pepper on the surface.

Washing-up liquid and soap make the water molecules hold onto each other less tightly. This means that the surface tension of the water is reduced, the water molecules spread out and they carry the pepper with them to the edge of the plate.

Soap reduces the surface tension of water and it's attracted to grease and oil. That means it pulls grease and dirt from your hands and mixes them with water. These drops are washed away when you rinse your hands under water.

Let's investigate

Try the experiment again, but this time with less pepper. What do you notice? What happens if you put cooking oil on your finger?

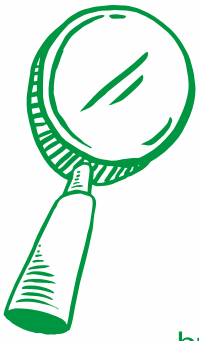
Take a closer look at surface tension: Use a medicine syringe or squirt bottle to put drops of water onto the surface of a coin. Surface tension keeps the water onto of the coin. How many drops can you add?

Get talking!

Show your family and friends the push the pepper trick. Ask them if they can explain the science. If they can't, you can explain it to them!

Find out more

Insects, like mosquitoes and pond skaters, use surface tension to walk on the surface of a pond. Go online to find out more.



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