Easy Science Experiments

…for your classroom

Please enjoy these resources which will guide you in how to carry out these fun and easy classroom experiments in your classroom. These experiments are perfect for early years teaching and most suitable for students ages 4 – 8.

For more classroom resources visit our EuroSTEAM online toolkit at www.eurosteamproject.eu

Balloon vibrations

This experiment demonstrated how sounds are made by vibrations and uses balloons to demonstrate this. This experiment can get noise so best not do this first thing in the morning!

Instructions

Blow up a balloon and tie it off.

Have the students in pairs and get one student to hold the balloon up to their ear and get another student to talk through the other side of the balloon with their lips against it.

Ask the student that is listening what they hear and feel!

Another task is to put a small lug nut into a balloon then blow it up and tie it off.

Gently twirl the balloon in a circular motion and listen for the banshee sound.

The science

Your voice is causing a vibration which is creating a sound wave. The sound wave travels through the air to the balloon, through the balloon to the air inside the balloon, back through the other side of the balloon, through the air again and into your partner's ear.

You can hear the sound and feel the vibration through the balloon. Where do you feel it?

This is because sound is created by vibrations of molecules and the balloon demonstrates this effect perfectly because you can actually feel the vibrations.

Extend

Try this in different ways to see the end results.

e.g. try humming into the balloon, try filling the balloon up with water then repeating the experiment.

Instead of using lug nuts for the screaming balloon, put a penny inside and see what effect that will have!

How plants drink

This experiment will visually show how plants drink and where they bring the water to when they do drink. This is a good experiment which would be good in an early years classroom!

Instructions

Arrange a row of glasses and fill each with water. Now put some food colouring into each glass making sure that each glass is a different colour.

Put a white flower or cabbage leaf into each glass and leave overnight.

Ask the students to record what they think will happen.

Inspect the flowers again the next day and see what has happened!

The science

This one is simple, we all know that plants drink and absorb water and other nutrients through their stems. This experiment uses the white of the flower and the bright colour of the water to demonstrate exactly where the nutrients pass through the flowers!

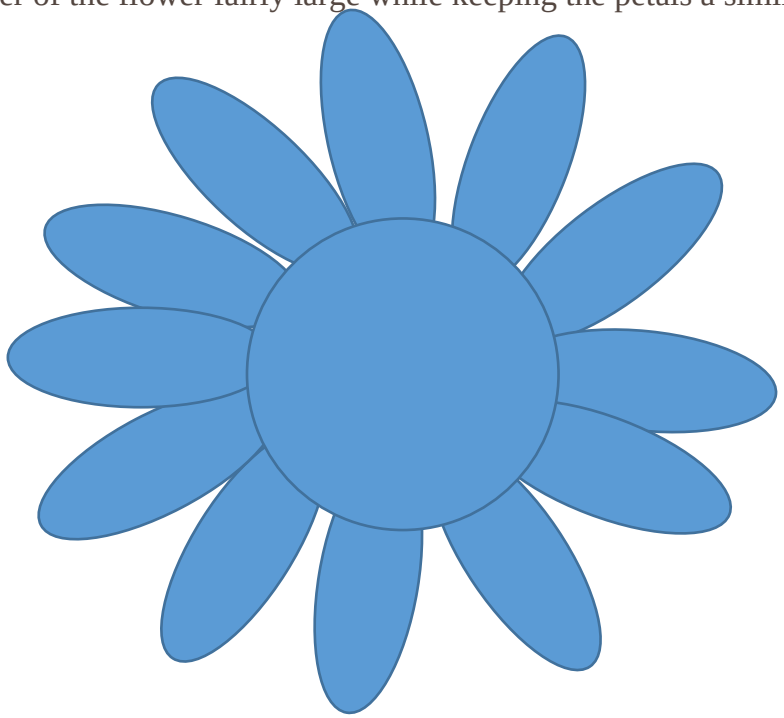
Image: funlearningforkids.com

Create your own flower that will bloom like magic

This is a very easy craft experiment that is perfect for early years. This will visually show the students how flowers bloom and let them test this effect on their very own, hand crafted flowers.

Instructions

Allow the students to create draw their own flowers (or use a template) Make sure to make the center of the flower fairly large while keeping the petals a similar size.



Let the students decorate the flowers in whatever way they think looks best.

Now fold the petals so that they all overlap each other in the middle.

Finally get a plate and put a small layer of water on the surface and drop the folded flower onto this and the flower will bloom beautifully.

The science

When paper gets wet, it absorbs the water and swells. This swelling causes the first petal to open and a chain reaction begins so that all petals will open. Unfortunately your flower will wrinkle up in the water but it is still fascinating to watch.

If your flower doesn't bloom, the folds in your petals have been done in a way that is trapping the petal and not allowing it to open, just try again with another flower

Extend

Try the same experiments with different shapes of flowers. Experiments with different sizes of petals and different colours and see what effects can be achieved!

Colourful experiment using food colouring, milk and fairy liquid

This is an experiment which shows reactions to the student in a fantastically visible way. This is perfect for early years children to experiment with and is perfectly safe for them to do on their own.

Instructions

Pour a layer of milk into a tray or dish.

Apply drops of food colouring around the dish closest to the centre should work the best.

Add some fairy liquid to a cotton bud and stick it in the centre of the bowl and leave it in, watch the amazing effect as the milk and food colouring react to the addition of the fairy liquid.

The science

Milk contains fat and the food colouring sits on top of the fat in the beginning. These fats are held together by bonds which are basically like the little bits of fat holding hands. The application of fairy liquid makes the bonds in the fat separate and as the fat separates, the milk moves and allows the colours to explode

Extend

Let the students try different variations of colour in this to achieve some amazing results.

Also, if you want to make the colorful creations stand out a little bit more, add some vinegar and baking soda to get an eruption of milk. Be careful with the mess however!

Image: coloringonline.com

Rockets and explosions

This is an experiment that shows the chemical reaction between water, vinegar and baking soda. This is very visual but better done outdoors!

Instructions

First of all put ¼ cup of water and ½ cup of vinegar into a sealable lunch bag.

Put a few teaspoons of baking soda on a tissue and wrap it up. Now quickly place the baking soda in the bag and seal. The bag will fill with air and maybe even make a small explosion.

Now find an old film canister and put the same ingredients (in smaller proportions) into it and place it on the ground. Make sure the students stand well back and watch as the film canister takes off.

Let the students design their own rocket shapes around the film canister using various materials and take them outside and let them launch it into space, with adult supervision of course!

The science

Baking soda and vinegar react with one another because they both have a lot of energy that they don't want and they can help each other get rid of it! The energy that they get rid of comes out as a gas and that gas is carbon dioxide. This fills up the canister and builds pressure, as this pressure gets too much the film canister pops.

Exploring Balance and centre of gravity

In this **science activity,** kids will place two pennies in various locations on a paper robot until they've discovered how to make the robot balance.

Instructions

Simply cut out the balance bots (below) and give them to the students. Give the Students 2 pennys along with some blu-tac to stick them on and allow them to try to stick them on in different places until they find the perfect spot to make the robots balance. This will be at the end of the robots hands. Students can then decorate their robots in different ways to customize their robot and show them to their friends!

Purpose

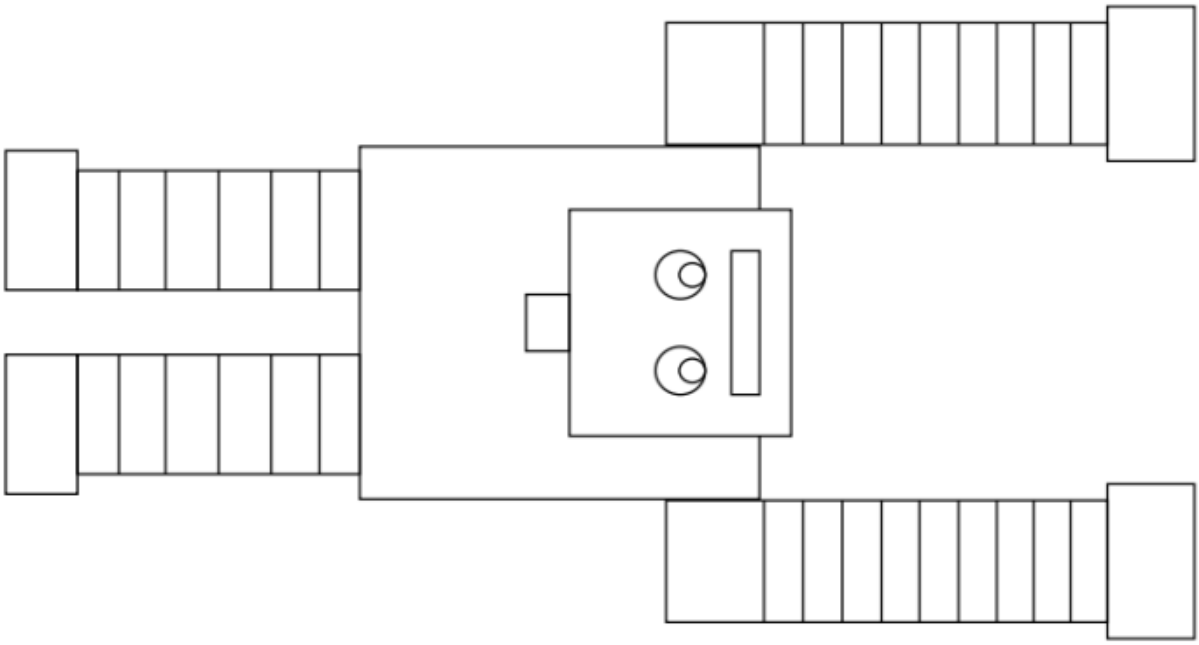
Give them time to try out sticking the pennies to different parts of the robot to try to get the robot to balance on their fingers. Watch them explore and discuss with their friends all the various ideas they come up with! Many will figure it out on their own. For those that don't, you can show them the correct placement of the pennies or invite other students to help them.

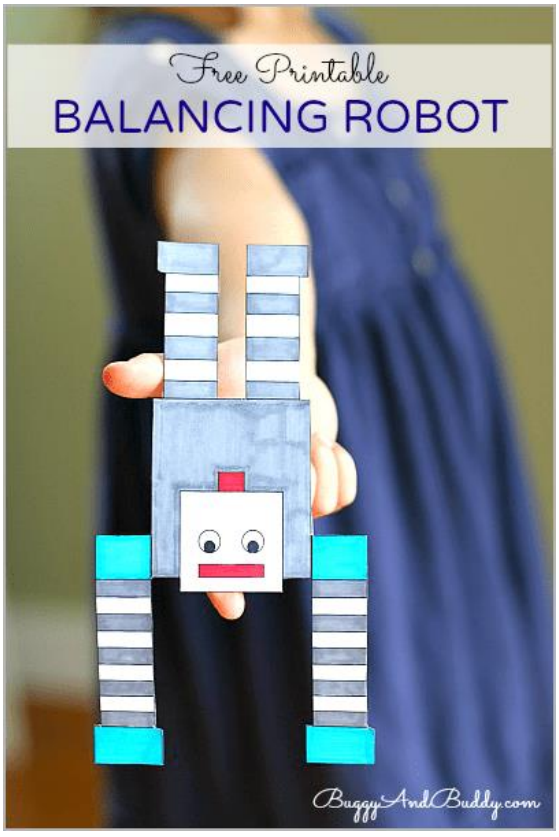
Once all the students have their balancing robots built correctly, let them explore balancing the robot in different places.

Extend

When the students have completed this, have them experiment with items from the classroom to try and build their own balancing monster e.g. This is possible with a lolly stick, pipe cleaner and 2 pegs.

See can the students experiment with these to work out the result!





What is the fizz in our drinks?

This is a very good experiment which demonstrated the physics of carbon dioxide in our fizzy drinks. See how it can react with certain items or different weights and textures.

Instructions

Pour some fizzy soda into a clear glass and explain to the students that the bubbles are the carbon dioxide in the drink which rise up to get to the air so that they can be released from the liquid.

Explain that this is why cans fizz when shaken, because the carbon dioxide bubbles are trapped to the side of the can in large numbers and when the can is opened the large amounts of carbon dioxide rise to the top to escape the liquid.

Test: shake a can and flick the side of the can several times around the outside to release the carbon dioxide bubbles, open the can and it will not fizz up!

No that the students know what the fizz is, drop some items into the can to see how they react with the carbon dioxide bubbles. Try the following items (works best with items of a density slightly greater than the water):

Raisins, lentils, different shapes of pasta and whatever else you can find!

Record what happens to each item

The science

Because the items above are slightly more dense than the water, the raisins will sink at the beginning. However because the bubbles attach to the rough surface of the raisins, the bubbles will raise the raisins to the top. When the raisins reach the top, the bubbles will burst and the raisins will descend to the bottom of the glass again and the cycle will continue.

This is a great visual way to demonstrate carbon dioxide in drinks

Creating Goop

This may just be the easiest, messiest, and most fun science activity. You should know that if you try this experiment and you are not smiling and messy with corn starch goo at the end, then you are definitely doing something wrong. Also keep in mind that this is not just about fun, there is some pretty amazing science going on here.

Instructions

This one is easy. All you need to do is mix some corn starch with water in a bowl or dish. There are no precise measurements for this but a rough guide is to add 2 cups of corn starch for every cup of water.

Different mixtures will result in different consistencies but they should all be fun!

Let the students just dig in and explore. Notice that the goo does not splash (or even move) if you hit it quickly. Squeeze it hard and see what happens. How long can you get the strands of goo to drip? What happens if you let the goo sit on the table for a minute and then try to pick it up? How does it feel? How does it move? Try bouncing a ball on the surface of the corn starch. You get the idea – explore!

The science

The corn starch is made up of long chains of atoms - a polymer. These chains can move past each other, but they take some time to do this. If you pour it slowly, it can flow like a liquid. If you try to force things and make the chains slide more quickly than they want to, they get entangled - and the mixture gets firmer. So if you push hard on it, it acts more like a solid.

Important

Warm water will very easily clean the corn starch however be careful NOT to pour it down the drain afterward as it can get trapped

Liquid Densities

This is a good way for students to learn about different liquid densities. Let the students explore by pouring liquids of different densities into a jar or glass. They will be able to visibly see which liquids are more dense (or more compact than others).

Image:mykidsadventures.com

Instructions

Have a look around the classroom or at home to see what liquids you have which can be used for this experiment. Below are some examples which will work well:

Water, Vegetable oil, Fairy liquid, vinegar, syrup, honey, milk

Challenge the students to see how many layers they can get in their glass!

The science

Why do objects that are the same size sometimes have different weights? The answer has to do with their *density*. An object's density is determined by comparing its mass to its volume. If you compare a rock and a cork that are the same size (they have equal volume), which is heavier? The rock is, because it has more mass. The rock is denser than the cork, then, because it has more mass in the same volume - this is due to the atomic structure of the elements, molecules, and compounds that make it up.

Liquids have density, too. You can perform several experiments with different types of liquids to determine which is more dense.

Extend

Drop different items into your liquids to see how they react. Some might float, some might sink and some might hover between the layers.

Fireworks in a glass

Using liquid densities we can perform this cool effect. Simply fill a glass up with water and put a thin layer of oil onto the top of the water. Drop a drop of food colouring into the oil and see what happens. Wait for a while to see the fireworks!

If this works for you, try dropping a few different drops of different colours in at the same time.

Image: pinterest.com

Exploring magnetism

This is a straight forward experiment which introduces a student to magnets and helps them understand what is magnetic and what isn't magnetic.

Instructions

Attach a magnet onto the end of a piece of string creating a magnetic fishing rod.

Get a large container and fill it full of objects, some magnetic and some not magnetic.

Ask the student to tell you 1 object which they think is magnetic. When they have told you the item, ask them to fish it out with the magnet and they will discover on their own if it is magnetic or not.

Let the student inspect the items after to get an idea of what is magnetic and what isn't.

The science

A magnet creates an invisible area of magnetism all around it called a magnetic field. The size of the magnetic field is determined by the strength of the magnet. Magnetic fields can penetrate through different items, not just air and can cause a pushing or pulling effect on objects (depending on the magnet).

Extend

Fill a large bottle up with magnetic objects, pipe cleaners are good for this. Allow the students to play with the magnet and seeing the pull they can get through the wall of the bottle. This will teach them about the size and distance of a magnetic field and will help them experience this for themselves. This is perfect for early years as the colorful objects can create some nice effects when being pulled around the bottle.

Try shaking the bottle while holding the magnet on the side!

Show a never-ending pendulum effect using simple items

This experiment will demonstrate how pendulums work and also shows how the energy created by a pendulum can be transferred.

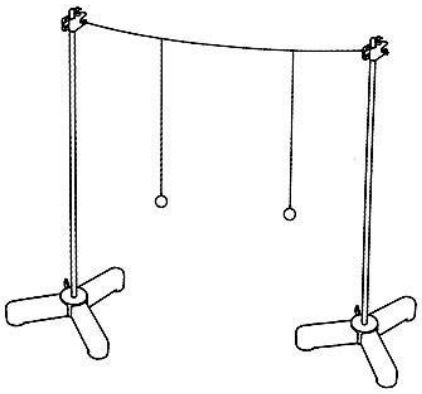
Instructions

Tie a length of string between 2 poles or objects so that it is dangling in the air.

Tie to separate pieces of string along the overhanging string so that there is a gap in between.

Tie a slightly weighted object onto the end of the strings e.g. a tennis ball.

Now swing one of the tennis balls from side to side and watch the effect this will create!



The science

The swinging object will slow down because the energy is being stolen from it! The energy travels down the overhanging string and passes it to the 2nd object. As this object speeds up the reverse happens and so on.

You can have a little fun with this one by telling them you can stop an object with their brain. Have them concentrate on the swinging object and tell them to try and make it stop just by thinking. When the object stops they will be amazed!

Feeling brave?

In a pendulum, the energy output can never exceed the energy input. To test this, tie an object e.g. a football onto a large piece of string or rope. If you stand to the side and let the student bring the football as close to your face as possible and then let it go, the rope will swing but will never come back as far as your face. Ensure the student doesn't swing the rope, simply lets it go.

This will test your nerves but will give the students a great thrill watching the football come within centimeters of your face, but be brave, the ball will not have enough energy to touch you provided you haven't stepped forward!

Plasma ball

This experiment uses a plasma ball to show how electricity can be conducted. This is very visual but is to be used as a demonstration with an adult showing the experiment to the students.

Instructions

Set up the plasma ball and show the students how when you touch it the sparks will become stronger where your finger is. This is because the electrons inside are always trying to reach the ground and they can do this by passing through your body.

Now hold the fluorescent light up to the plasma ball and see what happens. Hold it in different ways to see how the electricity is passing through you and where it is passing through the light!

The science

Inside the ball is a coil of wires that have a very high frequency current going through them. This means the electrons in the wires are oscillating very quickly. This shakes the atoms around the wires so hard that their electrons start to fall off and a plasma is formed! Inside the glass globe is a partial vacuum. This just means that some of the air has been sucked out. Because there is not as much air in there, it is easier to make electric sparks that can be seen.

When holding the lightbulb, the bulb will light at arm's length because the electricity is passing through your body to get to the ground. If you touch the light bulb closer to the plasma bulb, less of the bulb will light up, this is because, once again, the electricity is finding the quickest way to the ground and you have just created the quickest way by touching the bulb

Extend

Try various ways to light the bulb and see what works and what doesn't work.

You can also set a coin on top of the plasma ball, now touch this coin with another coin to see a spark of electricity. Be careful as the coin will heat up. You can also create a spark by touching the centre of the coin on the top of the plasma ball but it will burn your finger so be careful. DO NOT let the students attempt this, demonstration only!

Also, try to use your phone or tablet near the plasma ball to see what happens!