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SCIENCE EXPERIMENTS THEMED PROGRAMME



AIM

Explore the world of science as the group get hands on with a range of science experiments. Learn about static energy, make your own lava lamp, create a vacuum and even freeze your own ice cream. Link with British Science Week (6th-15th March 2020).

ACTIVITIES

-  Static Electricity Can Roll Game
-  Create Your Own Ice Cream
-  Lava Lamps
-  Jesus Frees Us From Sin
-  Pencil & Bag of Water Trick
-  Slime

SCIENCE EXPERIMENTS

» INTRODUCTION

Science is the study of the world around us. Scientists learn about the world by observing, describing and experimenting.

Science can be found behind almost everything we come into contact with in our daily lives, from electricity to cars, aeroplanes to mobile phones.

? DID YOU KNOW?

- Some of the world's most famous scientists are British - including Isaac Newton, Charles Babbage, Alexander Graham Bell and Stephen Hawking.
- The Eiffel Tower can be 15cm taller during the summer (when a substance is heated up, its particles move more and it takes up a larger volume).

It is recommended that all the activities are tested by leaders in advance of the meeting.



GET ACTIVE



10 MINUTES



PREPARATION
NEEDED

GET ACTIVE: STATIC ELECTRICITY CAN ROLL

- 1 Split the group into teams, sitting at one end of the meeting space with an empty drinks can and inflated balloon.
- 2 Place the drinks can on its side on the floor.
- 3 Children must take it in turns to rub an inflated balloon through their hair really fast and then hold the balloon close to the can, but without touching it. The can should start rolling towards them. After each go, swap players and carry on.
- 4 The team who can get their can to travel the furthest distance in 1-minute wins.

What you'll need:

- Balloons
- Empty drinks cans

THE SCIENCE BIT

Rubbing the balloon through hair creates invisible electrons with negative charge, which sit on the balloon. This is called static electricity. This power pulls objects with positive charge towards them.



GET LEARNING



10 MINUTES



PREPARATION
NEEDED

GET LEARNING: PENCIL IN THE BAG

- 1 Fill a plastic sandwich bag with water and seal the top using the seal / zip on the bag.
- 2 Hold the bag over a sink or bowl - just in case! Firmly and carefully stab the pencil through the bag, leaving it sticking out both sides of the bag. The bag shouldn't leak. Smooth round pencils work best.
- 3 Challenge the group to see how many pencils they can get to go through the bag before any leaking.
- 4 Carefully remove the pencils and watch as the water now floods out the bag.

What you'll need:

- Sandwich bag
- Pencils
- Water
- Bowl

THE SCIENCE BIT

The plastic sandwich bag is made out of something called polymer, which is very flexible. It's a bit like freshly cooked spaghetti! A sharp pencil can easily go through the polymer, but because it is so flexible, it quickly forms a temporary seal around the pencil to stop water leaking.





GET LEARNING



10 MINUTES



PREPARATION
NEEDED

GET LEARNING: LAVA LAMPS

- 1 Fill a glass $\frac{3}{4}$ full with water.
- 2 Add a small amount of food colouring to the glass.
- 3 Gently pour the vegetable oil into the glass. It should float on top.
- 4 Sprinkle the salt on top of the oil and watch as blobs of lava float up and down in the glass.
- 5 To keep the lava going add another teaspoon of salt.

What you'll need:

- Small glass
- Water
- 60ml Vegetable Oil
- Food Colouring
- 1 Tsp Salt

THE SCIENCE BIT

Firstly, the oil floats on top because it is lighter than water. When you add the salt, which is heavier than the oil and water, it drags some of the oil down with it. However, salt dissolves in water. When this happens, the oil then floats back to the top of the water again.



GET INTO THE BIBLE: JESUS FREES US FROM SIN

- 1 Show the children the coin and explain that it represents us. Place the coin on the plate.
- 2 Colour some water and describe this as sin. Ask the group for some examples of sin in our lives. Pour the coloured water over the coin (us) until it is fully submerged in water (sin).
- 3 Take the candle and tell the group this represents Jesus, place it in the water and light the candle. The flame is the light of Jesus. (Jesus is the light of the world - John 8:12)
- 4 Now carefully place the glass over the lit candle.
- 5 The flame will use up the oxygen in the glass and will then go out. During this process it will have created a vacuum which should in turn suck the water up inside the glass, leaving the coin (us) on the outside free of water (sin).
- 6 Conclude by explaining that Jesus gave up his life on the cross (flame going out) so that he could take our sin and we could be free, just like the coin is now free from the water. (Link to Easter)



What you'll need:

- Plate
- Coin
- Candle
- Matches
- Food Colouring
- Water
- Clear Glass

THE SCIENCE BIT

The flame quickly heats up the air in the glass. The hot air expands, forcing some of it out the bottom of the glass. When the flame goes out, because of a lack of oxygen, the air cools again quickly and contracts. This creates a vacuum, with lower pressure inside and higher pressure outside. This is what pushes the water inside the glass until the pressure in and outside are equal.





GET CREATIVE



20 MINUTES



PREPARATION
NEEDED

GET CREATIVE: SLIME

- 1 Pour 1 cup of PVA glue into a clean bowl.
- 2 Now add 1 tsp of bicarbonate of soda and mix the two together.
- 3 Add food colouring gel to colour your slime. Gel works better than liquid colouring, as it doesn't affect the slime's consistency.
- 4 Now add 1 tablespoon of contact lens solution and mix with a spoon. When it starts to become stringy and comes away from the edge of the bowl, you can then take it out the bowl and knead it between your hands. It may be messy to begin with, but will soon stick to itself.
- 5 If you wish, add in some glitter to decorate.

Once created, the slime is ready to be played with. See how far the group can stretch their slime, what shapes they can make etc. Provide a plastic cup to take the slime home in.

Note: To work, the contact lens solution must have boric acid in the ingredients list. If your slime is too sticky, then add a few more drops of solution to your mix.

What you'll need:

- PVA Glue
- Plastic cups
- Spoons
- Bicarbonate of Soda
- Contact Lens Solution
- Bowls

THE SCIENCE BIT

This polymer is unique as it has qualities of both a liquid and a solid. It will take the shape of its containers like a liquid, yet you can also hold it in your hands and pick it up. The polymer molecules chain themselves together, which means they can stretch and bend like metal chains and this makes them special.



GET CREATIVE



20 MINUTES



PREPARATION
NEEDED

GET CREATIVE: CREATE YOUR OWN ICE CREAM

- 1 Place the milk, cream, vanilla and sugar into the small zip bag and seal
- 2 Place some ice in the bottom of a large zip bag and a handful of salt. Add the small bag and then continue to fill the big bag with ice and the remaining salt until it is nearly full. Then seal the large bag.
- 3 Put the gloves on to keep your hands warm, hold the left and right hand side of the bag and shake (like you are using a steering wheel).
- 4 Continue shaking for 5 – 8 minutes. You may want to do this activity in pairs, so children can take turns shaking the bag.
- 5 Once the ice cream is set enough, take out the small bag, rinse any salt off the small bag and then open up and enjoy the ice cream! You could have sauces and toppings to add on.

What you'll need:

- 100ml Milk
- 100ml Cream
- ¼ tsp vanilla
- 4 tsp Sugar
- Ice
- 70g Rock Salt
- Large Zip Bag
- Small Zip Bag
- Gloves
- Sauces / Toppings

THE SCIENCE BIT

Adding salt to the ice forced the ice to melt. For the ice to melt, it needed to borrow heat from objects around it – in this case the ice cream ingredients. This made the ingredients colder, creating the ice cream. This is called the endothermic process.

