TinyHands Big Adventures

Messy Play

3 EASY STEM EXPERIMENTS FOR CHILDREN AGED 3-5

Simple science activities you can try at home using mostly everyday items.

TINY HANDS BIG ADVENTURES

A QUICK NOTE FOR PARENTS

Young children are naturally curious. They notice when things splash, mix, bubble and change.
STEM stands for Science, Technology, Engineering and Maths, but for young children it simply means exploring how things work.

When children mix liquids, watch bubbles appear, or test what happens when two things combine, they are beginning to think like little scientists.

The activities in this guide are simple experiments you can try together at home. They use mostly everyday items and are designed to be playful, sensory and easy to set up.

These activities are most suitable for children aged around 3 to 5, when children begin noticing patterns, asking questions and predicting what might happen next.
It is important that these activities are done with a grown up present at all times. The adult's role is not to lead the discovery, but to gently support the child's exploration and ensure safety.

I hope you enjoy trying these simple experiments together.

Love, Amanda xx

THE MAGIC COLOUR EXPERIMENT

A COLOURFUL EXPERIMENT THAT CREATES BEAUTIFUL SWIRLING PATTERNS.

WHAT YOU NEED

Milk (full fat works best)

A shallow plate or tray

Liquid food colouring

Washing up liquid

Paper stemmed Q-tip

HOW TO DO IT

- Pour a thin layer of milk onto the plate.
- Add a few drops of food colouring in different places.
- Dip a cotton bud or spoon into a little washing up liquid and gently touch it to the milk.
- Watch what happens as the colours begin to swirl and move across the milk.
- Children often find the patterns fascinating to watch.

THE MAGIC COLOUR EXPERIMENT

A COLOURFUL EXPERIMENT THAT CREATES BEAUTIFUL SWIRLING PATTERNS.

WHAT REACTION IS HAPPENING

Milk contains fat. When the washing up liquid touches the milk it reacts with the fat and breaks the surface tension. Surface tension simply means the thin layer that holds the liquid together.
As that layer breaks apart, the colours start to move and swirl.

WHAT CHILDREN ARE LEARNING

Children begin to notice that when something changes, something else happens too. This is known as cause and effect.
As the colours swirl and blend together, they may also begin noticing colour mixing, watching new shades appear as the colours move across the milk.
Children are observing closely, predicting what might happen next and asking questions. These are all part of developing early scientific thinking

Experiments like this support curiosity and investigation and link to the Understanding the World area of learning in the Early Years Foundation Stage (EYFS), where children begin exploring how materials behave and how things change.

THE LAVA LAMP BUBBLE JAR

A COLOURFUL BUBBLING EXPERIMENT THAT LOOKS A LITTLE LIKE A LAVA LAMP.

WHAT YOU NEED

A clear jar or glass

Water

Vegetable oil

Food colouring

Alka-Seltzer tablet

Safety Note; Alka-Seltzer tablets should not be handled or tasted by children. A grown up can add the tablet to the jar, or support children to place it in using tongs while supervising closely. Using tongs also supports hand strength and coordination, linking to the Physical Development area of the EYFS.

HOW TO DO IT

- Fill the jar about one third with water.
- Add a few drops of food colouring.
- Slowly pour vegetable oil into the jar until it is nearly full.
- You will notice the oil sits on top of the water instead of mixing.
- Drop in the Alka-Seltzer tablet and watch the bubbles rise and fall through the jar.

THE LAVA LAMP BUBBLE JAR

A COLOURFUL BUBBLING EXPERIMENT THAT LOOKS A LITTLE LIKE A LAVA LAMP.

WHAT REACTION IS HAPPENING

Oil and water do not mix, and the oil floats on top of the water. When the tablet dissolves it releases carbon dioxide gas. The gas forms bubbles that carry coloured water upward through the oil. When the bubbles burst, the coloured water sinks back down again.

WHAT CHILDREN ARE LEARNING

Children are observing how different liquids behave and noticing that some materials mix while others stay separate.

As they watch the bubbles rise and fall, they begin to notice patterns and movement, and may start asking questions about what is happening.

Talking about what they see also supports language development, helping children describe bubbles, colours and movement.

These kinds of hands-on investigations support curiosity, observation and early scientific thinking, linking to the Understanding the World area of learning in the Early Years Foundation Stage (EYFS). If children use tongs to place the tablet into the jar, they are also strengthening hand muscles and coordination, which supports the Physical Development area of the EYFS.

COLOURFUL FIZZING POTION TRAY

A BRIGHT, BUBBLING EXPERIMENT THAT CHILDREN LOVE TO REPEAT.

WHAT YOU NEED

A shallow bowl, tray or cup or container

Bicarbonate of Soda

Food Coloring

White Vinegar

A spoon or pipette

HOW TO DO IT

- Spread a layer of bicarbonate of soda across the tray or spoon in to the cup or container if using one.
- Add drops of food colouring in different places or add it to the vinegar
- Slowly pour or drip vinegar onto the powder.
- As the vinegar touches the bicarbonate of soda it will begin to fizz and bubble.
- Children can add more vinegar and watch the colourful reactions happen again.

COLOURFUL FIZZING POTION TRAY

A BRIGHT, BUBBLING EXPERIMENT THAT CHILDREN LOVE TO REPEAT.

WHAT REACTION IS HAPPENING

When vinegar and bicarbonate of soda mix together they create a chemical reaction.

This reaction produces carbon dioxide gas, which escapes as bubbles and creates the fizzing effect.

WHAT CHILDREN ARE LEARNING

ChChildren can clearly see that when two things mix together something new happens. This helps them begin to understand cause and effect.

As they watch the colours spread and the mixture fizz, children are observing closely, noticing changes and beginning to make predictions about what might happen next.

Using a spoon or pipette to add the vinegar also supports fine motor control and coordination, helping children practise careful movements with their hands.

These fun investigations support curiosity, observation and early scientific thinking, linking to the Understanding the World area of learning in the Early Years Foundation Stage (EYFS). Using tools such as pipettes or spoons also supports Physical Development, strengthening hand muscles and coordination.

A GENTLE REMINDER

Science for young children doesn't need to be complicated.

Often the most meaningful learning happens through simple moments of curiosity. Watching colours swirl, noticing bubbles rise, or wondering why something fizzed.

When children are given time to explore, repeat and ask questions, they begin to build the foundations of scientific thinking.

You don't need lots of equipment or perfectly planned activities. Sometimes the most valuable part is simply being there alongside them, noticing what they notice and supporting their discoveries.

Thank you for downloading this guide and spending time exploring together.

Love,

Amanda

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