June 2020

# Week 9 #SolveItWithSTEM@Home Experiment Pack for Secondary Schools

*featuring Alice and Eddie - our STEM Gurus*


Hey everybody – Week 9 has arrived! We still have a few weeks left of experiments so we hope you look forward to the next challenge.

Eddie and I have put together another interesting pack with two new experiments to try!

We hope you are also enjoying the weekly maths questions – a new one is available on page 7. The answers to Week 8 are on page 8.

Enjoy ☺

**Reminder: Make sure you do the experiment safely and with an adult present!**


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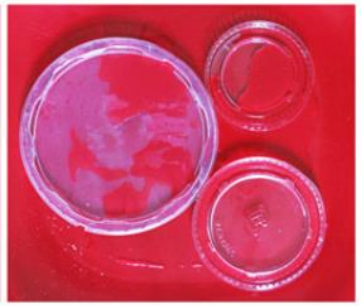
# Experiment #15: Crystal suncatchers

## (**Make sure you have an adult help you with this experiment**)

**Items Required:**

- Epsom salt (available on Amazon / Holland & Barrett)
- Clear plastic lids – the clearest you can find
- Empty jar
- Tap water
- Tray
- String
- Safety pin
- Spoon



**Instructions:**

- A ratio of one part water to one part Epsom salt (1:1) will be used in this experiment. Firstly, add one cup of Epsom salt to an empty glass jar.
- Using the hot tap, collect one cup of water – ensure the water is warm to hot. **Be careful when doing this as the water may turn hot quite quickly!**
- Pour the water into the jar with the salt - do this swiftly so that the water is warm.
- Stir the salt and water for 1-2 minutes to dissolve the salt.
- Place several plastic lids on a flat-bottomed tray.
- Pour some of the liquid from your jar into the plastic lids. Use enough to cover the bottom of the lid – be careful not to overfill!
- Place your lids in a sunny and undisturbed location – it may take a few hours or even a day to start crystallizing.
- When the liquid has completely evaporated your crystal suncatcher is ready!
- Very carefully insert a hole using the safety pin in the edge of the lid and thread a piece of string through the hole. Tie in a knot and hang your suncatcher up!

Check out the babble dabble do website for more details

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# How does it work?...

A crystal is an organized group of molecules, each with their own shape. For example, snowflakes are made of ice crystals and each snowflake is different. You can make crystals by using salt or sugar. For this experiment Epsom salt was used.
The atoms that make up Epsom salt, Magnesium (Mg), Sulphur (S) and Oxygen ($O_4$), separate when mixed with water and then reattach as the water begins to evaporate. As they continue to bond back together they make crystals.
Table salt is also a crystal in a 6-sided cube shape.

This explanation was taken from education.com– why not check it out!

# Experiment #16: Ice lolly stick catapult

**(Make sure you have an adult help you with this experiment)**

**Items Required:**

- 10 jumbo ice lolly sticks
- Rubber bands
- Suitable ammunition (such as marshmallows, pompoms, pencil top erasers etc)
- Bottle cap
- Sticky tape or glue stick
- Scissors

**Instructions:**

- Use a pair of scissors to make two 'V' notches on either side of two jumbo ice lolly sticks (in the same place on both sticks). Use **Image 1** as a guide for where to make your notches.
- Take the eight remaining sticks and stack them one on top of the other. Wind a rubber band tightly around each end of the stack.
- Push one of the notched sticks through the stack under the top stick of the stack – **Image 2**.
- At this point, flip your partially made ice lolly stick catapult over so that the stick you just pushed in is on the bottom of the stack.
- Lay the second notched stick on top of the stack and secure the two ice lolly sticks together with a rubber band as shown in **Image 3**. The 'V' notches that you cut help to keep the rubber band in place.
- Create more leverage with your catapult by pushing the stack of ice lolly sticks towards the notched ends connected by the rubber band.
- Use sticky tape or a glue stick to attach a bottle cap to the ice lolly stick. Get ready to fire away! **When firing the ammunition, please ensure you aim in a safe direction away from faces/people.**





Check out the little bins for little hands website for more details

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# How does it work?...

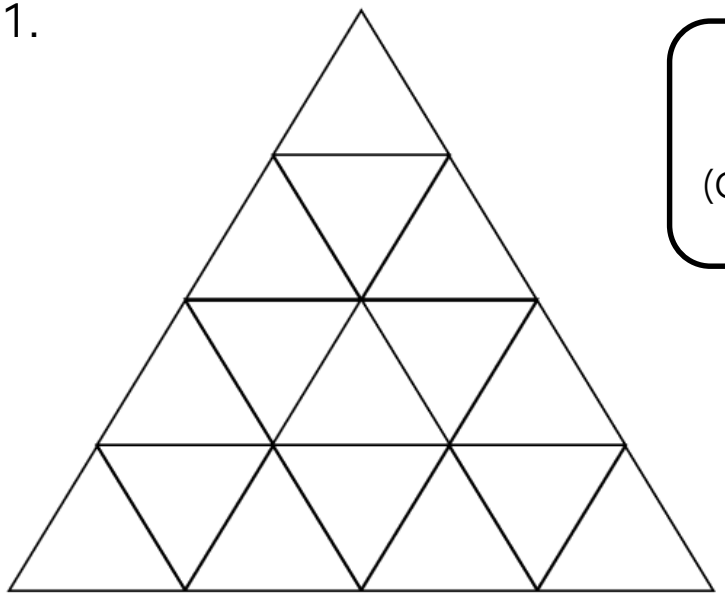
Newton's 3 Laws of Motion: An object at rest stays at rest until a force is applied, and an object will stay in motion until something creates an imbalance in the motion. Every action causes a reaction.

In this experiment, when you bend the ice lolly stick catapult back the potential energy gets stored up. When you release the catapult, the potential energy is released into energy in motion producing the projectile motion.

This explanation was taken from little bins for little hands website – why not check it out!

# Week 9 – Maths questions!

1.



How many triangles are there in the figure?
(Clue: the answer is not 16)

Why not give these maths questions a go. The correct answers will be included within next week's pack… stay tuned.

2.

There are 7 girls on a bus.
Each girl has 7 backpacks.
In each backpack, there are 7 big cats.
For every big cat there are 7 little cats.

How many legs are on the bus, not counting the driver?

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# Week 8 – Maths question answer!



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We hope you enjoyed the Week 9 activities.

Week 10 will be coming soon.

Best wishes
The ExxonMobil Fawley #SolveItWithSTEM Team!