

Curiosity Club

YOUTH GROUP ACTIVITY BOOKLET

PART 1



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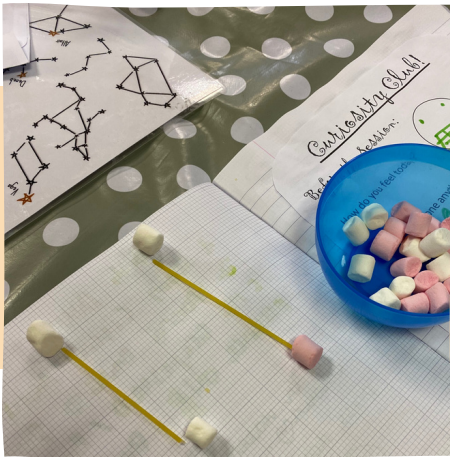


Curiosity Club

Curiosity Club is a 3-year programme that offers the opportunity to explore the role of science as a tool for motivating and empowering young people. Working with People Know How, we supported young people in North Edinburgh and East Lothian who had been referred as potentially benefitting from additional support whilst transitioning between primary and secondary learning settings. This programme was funded by BBC Children in Need and Wellcome.



A key element of this programme has been exploring the question of how youth workers, especially those without a STEM background, approach and embed science activities to support young people to develop positive relationships, confidence and resilience to failure.



"At the beginning it was nerve wracking for me – doing science has always looked exciting but I have very little background in doing that kind of thing. But learning with the young people, doing the experiments with them – learning and failing with them – and realising it doesn't always work and that's OK, has actually been really empowering. Curiosity Club has taught me to fail, not know the answer, and discover it all with the young people."
~ N, Youth Worker

Throughout the programme the youth worker's have highlighted improved emotional wellbeing and engagement with learning in the young people. Many of the group have low attendance in their other school classes yet consistently attend the Curiosity Club. The group provides a safe space for the young people to express their emotions and explore their curiosity through science activities.

Quotes from the young people:

"I don't really like school. But I look forward to this."

"I love science because I get to just be"

"I always look forward to Wednesdays because of Science Club!"

"Are we allowed to make mistakes?"



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Edible DNA

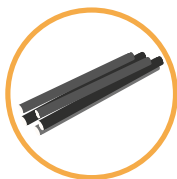


DNA is the material that carries all the information about how a living thing will look and function. For instance, DNA in humans determines things such as what colour our eyes are or what texture our hair is. DNA is made up of three key components, sugar, phosphates, and a base. The sugar and phosphates make up the strands of the DNA while the bases attach the strands together like the rungs of the ladder. The bases are where the information in DNA is stored. There are four main types, Adenine, Thymine, Guanine and Cytosine also known as A, T, G and C. A always pairs with T while G always pairs with C.

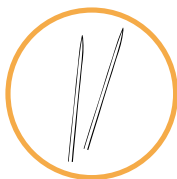
What do you need?



24 Jelly Tots



2 Strawberry Pencils



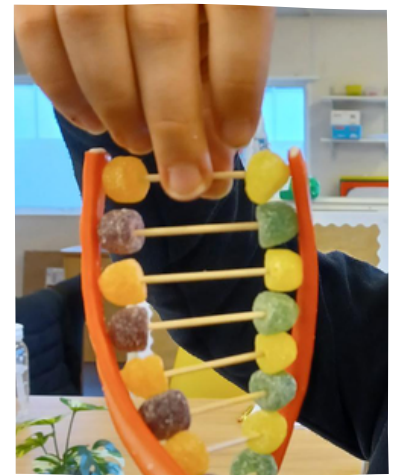
12 Cocktail Sticks

"They all seemed really proud of the end products and were extra excited when they discovered they could eat them."

~ A, Youth Worker

What to do

1. The strawberry pencils represent the sugar phosphate backbone while the jelly tots represent the DNA bases.
2. Pierce through a jelly tot on either end of a cocktail stick, pushing them far enough that we can still see the edges of the cocktail stick (make sure to always pair the same colours for base pairings!) – repeat this for all 12 cocktail sticks.
3. Now take one of your strawberry pencils and working from the top to bottom pierce each cocktail stick into the pencil.
4. Pierce the second strawberry pencil into the other end of the cocktail sticks so you have what looks like a ladder.
5. Once all your sticks are inserted you should be able to twist it, having a structure that represents a DNA helix!
6. Observe the order of everyone's jelly tots noting that the colours are in different orders, this is the same as our DNA with everyone having a different order of bases which make us all unique!



Youth work context

We found piercing the jelly tots with the cocktail sticks and connecting the strawberry pencils with the ends of the sticks can be quite fiddly. The young people are encouraged to **assess the risk** through this activity and **make reasoned decisions** to put their DNA helix together safely.

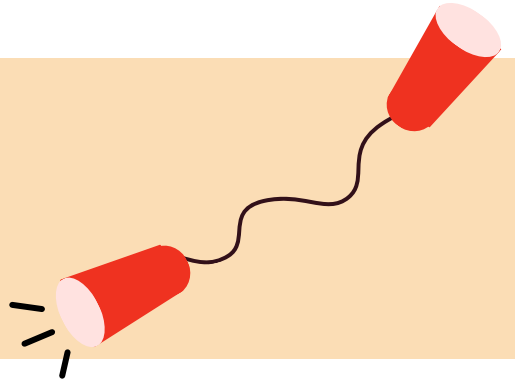
AT A GLANCE

- Few materials
- Quick and simple



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String Telephone



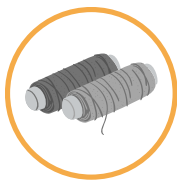
All sound begins with vibrations. These are turned into sound waves which travel through the air and are captured by our ears and our ear drums. Our ears are shaped in a special way to capture these sound waves.

Sound waves can travel through air, but also through solids and liquids like string or water. Sometimes these sound waves are very quiet, but certain materials and shapes, like a cup, can help make the waves bigger and the sound louder. This process is called amplification.

What do you need?



2 Paper Cups



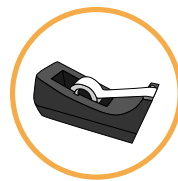
String



Hammer



Nail



Tape

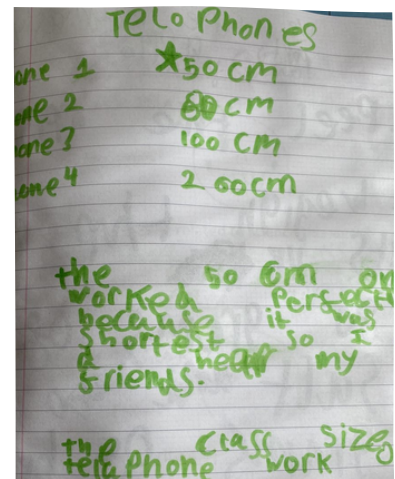
What to do

1. Hammer a nail through the base of the cups to make a hole in the end of each cup (an adult should do this step).
2. Insert one end of the string through the nail hole in one cup and tie a knot on the inside of the cup. Repeat with the other end of the string in the other cup and secure the string with tape.
3. Hold one cup, and give the other cup to someone else. Walk away from each other until the string between the can is taut.
4. Speak into the open end of one can while your partner listens to the open end of his can. Switch it around and listen to your partner speak back.

TIP

If doing this with a group, get each pair to try out a different length of string.

We found that groups particularly enjoyed making the string the length of the room.



Youth work context

Although simple to set up, string telephones are a great activity for encouraging **teamwork**, be it within the group or between the youth workers and young people. It can also be fun to scale up this activity, allowing the group to **set their own targets** or make guesses about how long the string can get before the telephone stops working and why this might happen, and see if **they can troubleshoot** in order to go even further.

AT A GLANCE

- Few materials
- Works best in a group



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Storm in a Glass



Clouds are made up of lots of tiny water droplets, and can contain millions of litres of water. When a cloud gets too heavy to hold more water, the water falls to the ground. This process is called precipitation and includes rain, hails, snow and sleet. In this experiment, you will show this using shaving cream.

The shaving foam represents the clouds, the clear water below represents the sky, and the coloured water above represents the water that the clouds are 'holding', which will eventually fall into the sky below.

What do you need?



Water



Large Glass



Shaving foam



Spoon/s

Food Colouring
(blue)

Cup

What to do

1. Pour water into the glass until it is half full.
2. Spray a layer of shaving foam to cover the surface of the water – make it as thick or thin as you want, but leave space for adding more water on top!
3. Smooth over the shaving foam with your finger or a spoon to make it flat and fill in any holes.
4. In the cup, mix together water and a few drops of food colouring.
5. Using your spoon (make sure it is clean if you used it to smooth over the shaving foam), take water from the cup and pour it into the glass spoonful by spoonful, and keep count!
6. When the coloured water gets too much for the shaving foam to hold, watch it rain below!
7. You can try this again with different thicknesses or shapes of shaving foam and compare how much coloured water is added before the storm happens!

TIP

Provide a tray or wipeable tablecloth for spills and easy cleaning of foam. A source of water is also helpful.



Youth work context

This activity was well-received by our young people, the highlight for them was getting to play with the food colouring and shaving foam! The different colours and textures can be **exciting**, and **observations** made during the activity about how water, food colouring, and shaving foam interact can be a starting point. With no pressure to produce a specific result, there is opportunity for **free experimentation and expression**.

AT A GLANCE

- Few materials
- Option to get messy
- Quick and simple



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Pepper 'Germs' vs Soap



Soap is important in 'unsticking' germs from our hands. We can see how it does this by using ground pepper as 'germs'.

The ground pepper floats because of the surface tension of the water. The water molecules are stuck close together and the pepper is light so it floats without breaking the surface. When the washing up liquid touches the water, it breaks the surface tension and some pepper might sink. However, the water 'tries' to keep its surface tension by moving away from the soap in the centre, carrying the ground pepper with it.

What do you need?



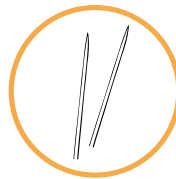
Water



Shallow Bowl



Ground Pepper

Washing Up
Liquid

Cocktail Sticks

What to do

1. Pour water into the plate so it covers the surface.
2. Grind or sprinkle pepper evenly all over the surface.
3. Touch the centre of the plate with a clean finger or with the tip of a clean toothpick. Nothing significant should happen.
4. Now put some washing up liquid on the tip of a clean finger or of a toothpick and touch the water in the plate again.
5. This time pepper should move away from the object with soap on it towards the edges of the plate.

TIP

For this activity to work, the pepper needs to be floating on top of the water. We found that stirring the water or adding too much pepper at once can make it sink, so sprinkle sparsely.

Youth work context

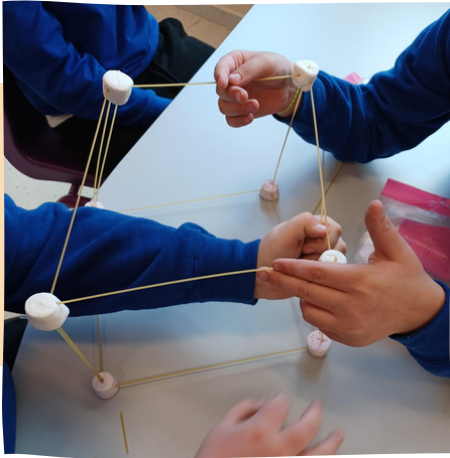
The familiar household objects used here allow young people to easily share their learning from the activity with others. We found it worked best when taking time to **patiently complete each step** and observe the effects closely. The precision needed in the experiment can help hone **fine motor skills** and encourage young people to **stay focused**. As it is very quick and simple, it is ideal for **testing several times**, allowing the young people to make small changes and **observe or record** their results.

AT A GLANCE

- Few materials
- No preparation needed
- Quick and simple



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"I love the experience of seeing the young people be so excited about science! I had so much fun practising and creating experiments with the young people. I wish I had that type of approach to science when I was their age, not only by experiencing science as a fun creative thing to do, but also being encouraged and assured that anyone can be a scientist!"
~ A, Youth Worker

"I was kind of apprehensive about leading the science activities at the start – I had no experience of doing this type of thing – but the support of Lewis and Alexia and working through and planning the science activities together has been really helpful. Seeing science from the young people's experience helps make it really exciting! I'm still a bit nervous in case they ask a question I don't know the answer to... but I feel a wee bit more confident telling them I don't know the answer and we can work it out together. I guess I no longer think it's bad to not know the answer, and it's been really fun delivering the sessions with them."
~ K, Youth Worker

I can see that science has been a good tool to build their team work skills, it gets them to sit down and opens up discussion. It's teaching them to be patient and developing life skills. I think resilience is a big part of it, even if the experiment hasn't gone to plan, they are still having fun so they aren't too worried if the outcome isn't as expected .
~ B, Youth Worker



If you have any feedback for us we would love to hear it! Similarly, if you try out any of the activities, please let us know (we especially love seeing photos of the activities in action). Get in touch at: lewis@scienceceilidh.com