THE PRINCE'S FOUNDATION

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS

UP, UP AND AWAY

These Activities follow on from the Shoot to the Moon workshop that you have taken part in at Dumfries house STEM Centre. Using what you learned about forces during your visit can you explore them further to explain how these experiments work?

Activity 1:

Upside down water

You'll need a paper cup or small bucket with a handle, a jug of water, some string and scissors.

1. Use the string and scissors to create a hanging handle for the cup so that it dangles down by about 50cm and is able to hold some water.
2. Pour some water into the cup, about half full should do it.
3. Now find an outdoor space where you have plenty of room. Holding onto the end of the string swing the cup of water around in a big circle, down to the ground and then up over your head, keep the cup moving in big circles over your head.

Discuss...

What direction does the cup go in if you let go of the string?

Why doesn't the water fall out of the cup?

Now the tricky bit, can you stop the spinning cup without getting soaked?

How does it work?

As you swing the string in a circle the cup and water are actually trying to travel away from you in a straight line, that's why when you let go it shoots off into the distance. The string (or the force that you are using to hold it in place) is called centripetal force, and it prevents the cup from travelling in that straight line away from you and instead forces it to travel in a circle.

Because the water and cup are trying to travel away from you they are pushed to the outer limit of the circle, keeping the water in the cup, and keeping you dry! This is the same push that you feel when you travel round a tight bend in the car, you are being pushed to the outside of a circle, while your seatbelt prevents that from happening. This push is called centrifugal force.

Activity 2:

Make a trick plane

During the Up, Up and Away workshop we had a go at making the most balance planes we could, this was so that they would fly in a straight line, but what if that wasn't the aim? What if we asked you to make the wonkiest planes possible?

Make a normal paper aeroplane, as symmetrical as you can, it should fly relatively straight. Now what happens if you mess with that symmetry, add or take away weight. Can you make your plane heavier on one side or at the front or back to make your plane…

1. Do a barrel roll
2. Do a loop the loop

THE PRINCE'S FOUNDATION

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS

USEFUL RESOURCES

Paper aeroplane instructions:

www.foldnfly.com/#/1-1-1-1-1-1-1-1-2

Who knew there were so many different designs of paper aeroplane?

Make a bottle rocket:

www.science-sparks.com/making-a-bottle-rocket/

Have a go at making your own rocket launcher and test how far it'll go

Help find new galaxies, far, far away:

www.zooniverse.org/projects/zookeeper/galaxy-zoo

Help astronomers identify new galaxies in photographs taken by powerful telescopes.