

PLANES AND LAUNCHERS

SUMMARY OF ACTIVITY:

Activity Description: Twist on the paper airplane - Participants will build and launch their own “straw planes” and can even have a competition to see who has the best flier!

STEAM Skills: Engineering - fine motor skills

Activity Details:

- Age range - All ages
- Length - 30 mins

MATERIALS AND SUPPLIES:

Airplane:	Launcher
<ul style="list-style-type: none">● Straw	<ul style="list-style-type: none">● Elastic band
<ul style="list-style-type: none">● Paper clip	<ul style="list-style-type: none">● Cardboard strip
<ul style="list-style-type: none">● 3 paper strips 1”x5”	<ul style="list-style-type: none">● 2 brass fasteners

General supplies needed: tape, markers (optional)

TALKING POINTS AND BACKGROUND:

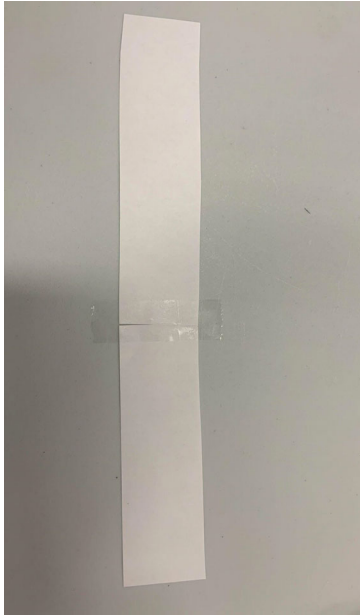
Bernoulli’s Principle describes how an increase in the speed of air or other fluids, results in a decrease of pressure. But what is **pressure**? Imagine you are holding a piece of paper on a windy day. The air particles blowing onto the paper are what causes pressure - you can feel the paper wanting to blow away. This is because there is a difference in pressure; there is more pressure on the outside due to the wind, which causes a force. Pressure can also be spread out as well. If you try to hammer a large object into a wall, it doesn’t work really well because the object has much more area, so the force is spread out and there is less pressure. But if you hammer a small object, all the force is concentrated in one are, so you have high pressure! Going back to the Bernoulli principle, air which is moving faster exerts less pressure on objects it rushes past, compared to air which is moving slower - kind of counter intuitive! But this principle explains part of why an airplane is able to fly! The air on the top of an airplane wing will move faster than the air below it, meaning there is less pressure there. On the other hand, air below the wing moves slower, so there is more pressure on the bottom of the wing. Overall, the force on the wings is up, which is enough to counteract gravity and generate lift.

Take a look at a regular elastic band. When you stretch it out, you can feel it wanting to return to its original shape. What you are feeling is the band's elastic potential energy - this is a fancy way of saying how elastic something is! We are going to convert the elastic potential energy of the elastic band into kinetic energy of a paper airplane - in other words, we are going to make a paper airplane launcher!

PROCEDURE:

Part One: Plane Build

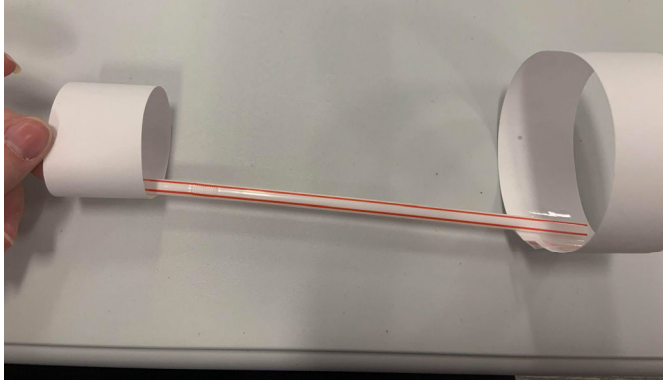
1. Tape two of the paper strips together "longways".



2. Form both the longer strip and the leftover short strip each into a circle and tape to secure. These will form a large circle and a smaller circle.



3. Tape the straw to the insides of the circles; tape the large circle to one end and the small circle to the other end.

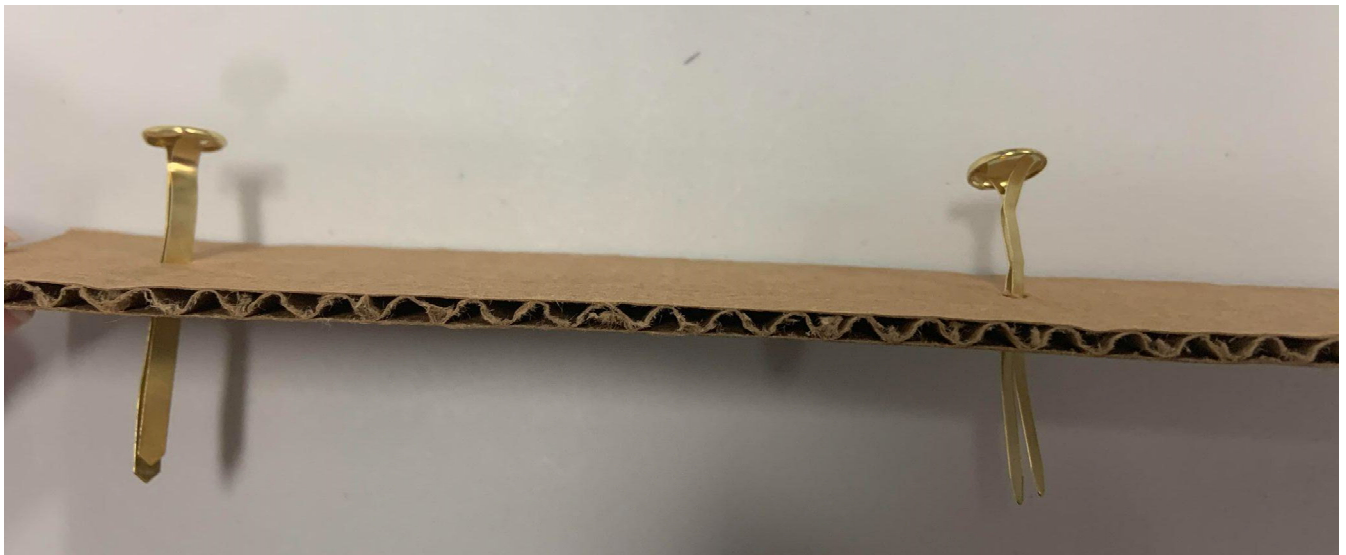


4. Hook a paper clip onto the end of the small circle of the plane

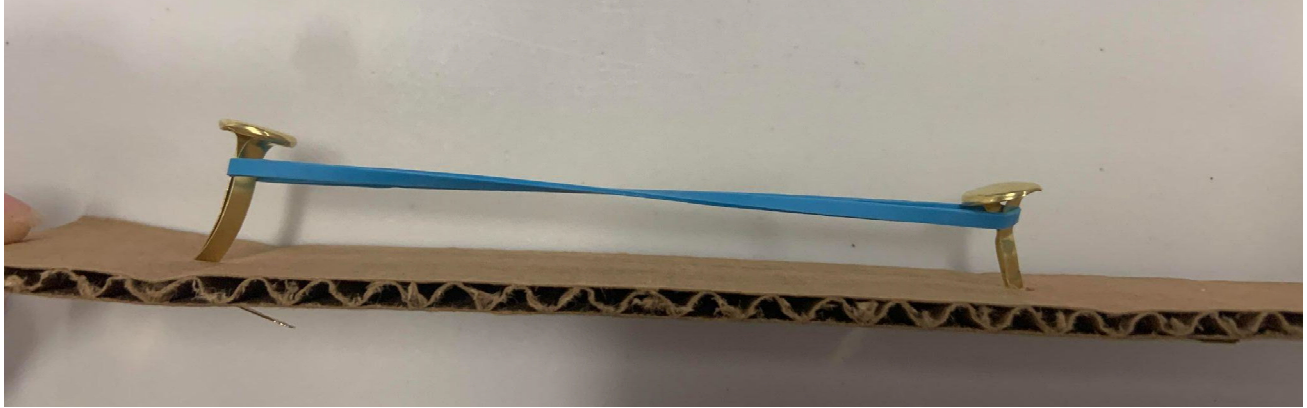


Part 2: Launcher

1. Poke two brass fasteners to the piece of cardboard with enough space between them.



2. Attach an elastic band between the fasteners.



3. Use the launcher to shoot your plan as far as it can go!

TIPS AND TRICKS:

REFERENCES OR OTHER LINKS:

<https://allfortheboys.com/move-over-paper-airplanes/>