



SUPER POWER: Levers!

SUPER THROWING ARM

LAB NOTES...

WHAT'S GOING ON?

A lever works by reducing the amount of force needed to move an object. The shortest lever on our arm when we are throwing something is the distance from our wrist to our palm.

One way to help to increase the distance that we can throw something is by increasing the length of our lever. Your tube increased the length from your wrist to where the ball was held from your palm to the end of your tube. This increased the power of your throw and you should have been able to throw it further than just using your normal arm throw once you got the hang of using it.

This teaches us that if you want to throw something very heavy or very far it's easier to do if your lever is longer.

TO MAKE YOUR SUPER THROWING ARM...

BUILD TIME
10
MINS

1. Watch the video of Nanogirl making her super throwing arm.
2. Make your projectile by scrunching up a sheet of paper into a ball.
3. Measure how far you can throw it.
4. Make a card tube just big enough to fit your fist inside by rolling and taping the card
5. Place your closed fist inside and use a pencil to mark where the middle of your hand sits.
6. Push a skewer through the centre of the tube at the point you marked to make a handle.
7. Measure the height of your paper ball and mark this measurement down from the top of your tube.
8. Create a scoop shape by drawing horizontally from this mark halfway around the tube then up the sides to the top, and cutting this shape out.
9. Take another skewer and push it through the centre of the tube at the bottom of the scoop point to hole your projectile in place.
10. Trim off any long ends of the skewers and make you can hold onto the handle safely.
11. Put your hand into your super throwing arm, grip the skewer and load the top with your paper projectile.
12. Stand in the same place that you threw your paper last time and see how far you can throw it with your new arm extension.

YOU WILL NEED

Thin card (like cereal box card)
Plain paper
Scissors
Tape
2 x Wooden skewers
Pencil
Ruler

Hold the paper ball in your hand and measure how far away it is from your wrist. Then put the paper ball in your super throwing arm and put that on your hand. Now measure that same distance again - how much longer is it?

Did your throw distance change with the super throwing arm? How much by?

What do you think would happen if you made the super throwing arm even longer?

Can you think of a way to redesign the scoop in your super throwing arm to hold other shapes and sizes of projectile.

Can you think of an example of where you have seen a lever before to help people lift heavy objects or throw things further?