



# High Touch High Tech®

Science Experiences That Come To You™

## Catapult

### Supplies:

- Plastic spoon
- 5 rubber bands
- 7 regular size craft sticks
- 2 tongue depressor size craft sticks
- Large pom pom

### Instructions:

1. Take one of the larger craft sticks and use 2 rubber bands to attach your plastic spoon. The bowl of the spoon should hang off one end of the craft stick. Put a rubber band at the end of the craft stick right below the bowl and then a second one around the end of the spoon so that the spoon is fully attached to the craft stick.
2. Put one small craft stick down and then put your second large craft stick (without the spoon) perpendicular across the smaller one so that it forms a lower-case t.
3. Stack the remaining 6 craft sticks and put them on top of your "t". Use 2 rubber bands to bind the ends of all 7 craft sticks: one rubber band on each end. This should sandwich the larger craft stick between 1 and 6 small craft sticks.
4. Now take your large craft stick with the spoon and rubber band the end without the spoon to the shorter end of the sandwiched large craft stick. The stick with the spoon should sit at an angle over the stack of smaller craft sticks.
5. Test out your catapult by putting one hand on the bottom large craft stick and then pulling back on the spoon bowl. When you release it, you should see a catapult-like motion.
6. Put your pom pom in the bowl of the spoon, pull back the spoon, and release! WOW! Look at how far your pom pom went!
7. Extension: adjust where the stack is by moving it back and forth and you adjust the power of your catapult. If the stack is closer to the end, the catapult will launch your pom pom higher and/or further. And vice versa.

### The Science Behind it:

A **catapult** is a **lever**, a stick or beam, propped up by a **fulcrum**, the pivot point. The catapult magnifies your force to throw an object. So, you do not need as big of a force to propel a large object, but the larger the force, the farther the object goes.

Levers and fulcrums can be used to pick up heavy things like rocks and building materials. Have you ever used a sea saw? That is a lever and fulcrum! Wheelbarrows and crowbars use leverage and catapults were used in ancient times to throw heavy rocks.

Can you point out which part of your catapult is the lever, and which is the fulcrum? The craft stick with the spoon is the lever and the stack of other craft sticks is the fulcrum. The spoon beam pivots around the stack to generate the force to launch the load. When you press down on the spoon, it pulls up on the rubber band on the opposite end – this is potential energy. When you release it, the spoon gets pulled back and the pompom goes flying! It does not take very much effort to launch the pompom because of the lever and fulcrum.