


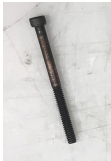







Mechanical Activity 1 - Build Your Own Catapult Instructions

Parts and Pieces:

Number	Part Name	Image
1	Catapult Base	
2	Catapult Uprights	
3	Catapult Arm	
4	Assembly Bolt	
5	Assembly Wing Nut	
6	Washer Weights	

7	Pivot Bolt	
8	Sling	
9	Projectile	

Catapult Assembly:

1. Snap the two matching **Catapult Uprights(2)** on both the sides of the **Catapult Base(1)**.



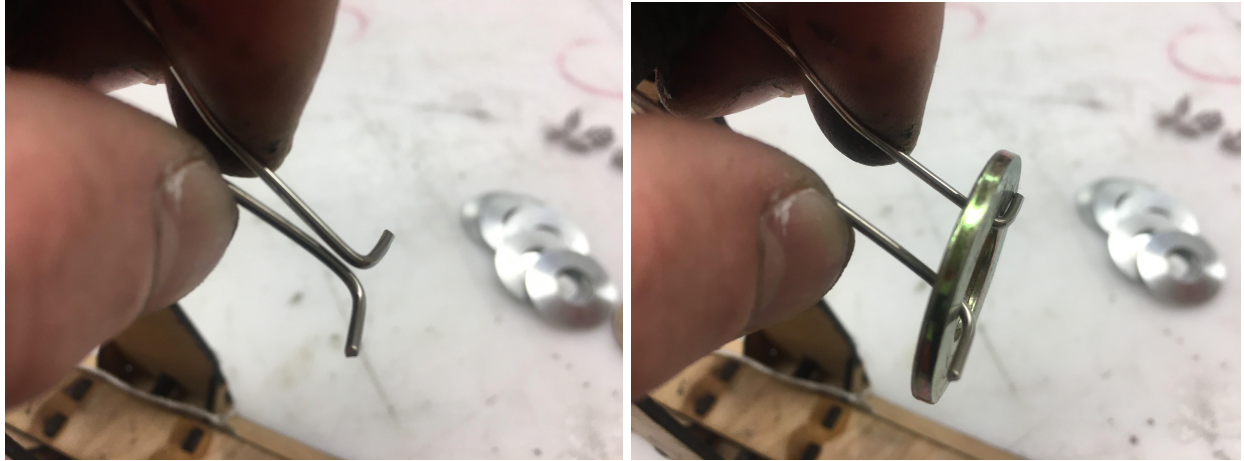
2. Slide the **assembly bolt(4)** through the hole in the center of the base and both upright pieces.



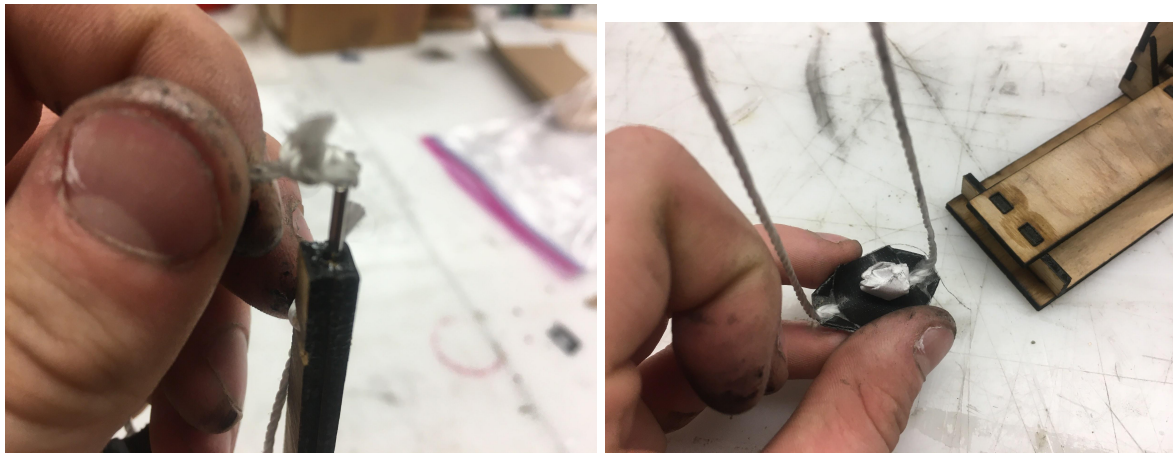
3. Screw **assembly wing nut(5)** onto the end of the bolt to secure the upright pieces to the base.



4. Hold the **catapult arm(3)** where you want to put it, then slide the **pivot bolt(7)** through a hole in the upright pieces and the arm. If this is the first time you're using the catapult, try the █ hole on the uprights and the █ hole on the arm, shown in the picture above.



6. Put at least one **washer weight(6)** on the wire at the wide end of the catapult arm by squeezing the wire holder and sliding it on. If this is the first time you're using the catapult, try using 3 weights.



7. Put the **projectile(9)** in the **sling(8)** on the thin end of the catapult arm, hang the string over the pointy end of the arm so it stays there.



8. Make sure the catapult is pointing in the direction you want to throw the projectile, the projectile will go up and towards the wide end of the catapult arm.

9. Lift the weighted end of the catapult arm up.

10. Let the weighted end of the catapult drop to launch the paper projectile!

11. Write down how far the projectile went:

How high did it go? This is hard to measure, consider if it went higher than your knees? Higher than a table? Higher than your shoulders?

12. Try out different combinations! What happens when you...

Put the catapult arm low on the upright pieces?	
Put the catapult arm high on the upright pieces?	
Use only one weight on the end of the catapult?	
Use lots of weight on the end of the catapult?	
Attach the catapult arm close to the weighted end?	
Attach the catapult arm close to the sling end?	

#+1. Challenge! Write the answers to these, or talk about them with your family or buddies!

What is the farthest distance any of your designs could launch a projectile?

Which design did the best?

What do you think that design did differently from the others to launch something so far?

What was the highest height any of your designs could launch a projectile to?

Which design did best?

What do you think that one did differently from the others to launch something so high?

Were the farthest launching and highest launching catapults the same design, or different?

Why do you think this is?