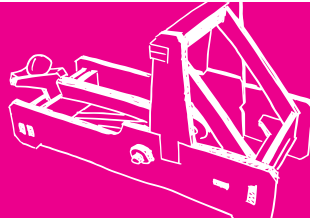# ACTIVITY 1
LET'S TEST THIS ARM STRENGTH!

GATHER YOUR SUPPLIES

So we can see how much muscle this thing has!

BUILT CATAPULT **BEADS** **NOT INCLUDED: SAFETY GLASSES, MEASURING TAPE OR RULER, ARM BLOCK, AND OBJECTS FOR MARKING**

The military often used catapults in a process called ranging. Ranging is when they test-fired the catapult with the same load repeatedly to determine how far the catapult would fire. This way, when they used it in battle, they could more accurately fire the catapult right away.

You will range your catapult by using the empty holes behind the lever arm to limit the distance the catapult arm can pull back. First, you need to find or make something that will fit in the holes to create an arm block, or stop. A paper clip with one arm bent out slightly (Figure 1) can be easily pushed through the holes (Figure 2). You can also cut a strip from the scrap material leftover from your EZ Catapult kit.
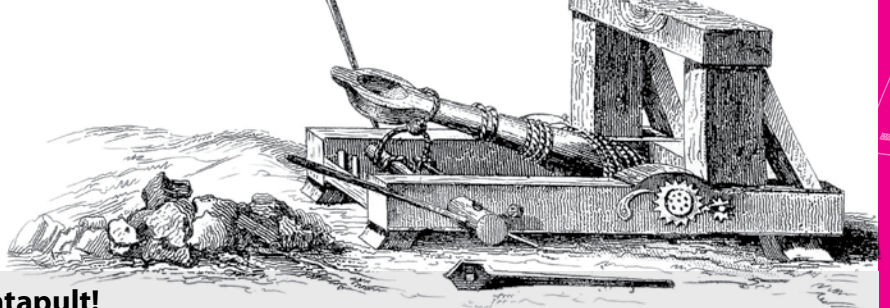
FIGURE 1   ## FIGURE 2

You can move the lever arm block back to allow the arm to be pulled back farther. Record your hypothesis about what will happen to the range of the projectile when you pull the arm back farther.

Hypothesis: _____

Now comes the fun part. **Testing the catapult!**

First, **put on your safety glasses**. You will want to test your catapult at least 10 times with the stop in each hole. Fire one bead at a time and measure and mark the position of the beads using objects such as pennies, circle punch-outs from EZ Catapult kit, or masking tape. Record your data in the table provided. When finished, calculate and record the average distance the catapult will fire the projectile with the stop in each of the three holes.

Trial	Stop 1 Distance (in.)	Stop 2 Distance (in.)	Stop 3 Distance (in.)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Averages			

THINK ABOUT IT

ASK THE QUESTION
Because understanding the why is important.

Did the test prove your hypothesis wrong?

Write a paragraph explaining how your catapult works. Include a diagram showing the different parts of the catapult.

Was the change in distance the projectile traveled between holes one and two bigger, smaller, or the same as the change in distance the projectile traveled between holes two and three?