UNIT: JCI BUILDING SYSTEMS

FIND THE PATTERN!

Your Mission:

Experiment with your catapult by launching at **three different angles**: 30°, 45°, and 60°. Measure how far the cotton ball travels for each angle. Then, look for patterns and figure out which launch angle works best!

GOAL: Test how different launch angles affect the distance a cotton ball travels and identify which angle works best for maximum motion.

Materials:

* Your completed catapult
* Cotton balls or pom-poms
* Ruler or measuring tape
* Angle guide (or printed protractor card)
* Data table
* Pencil

STUDENT DIRECTIONS:

**Step 1: Set up your catapult for 30°**

* Use the angle guide to tilt your catapult to approximately 30 degrees.
* Secure it in place using tape, a clipboard, or another support if needed.
* Place a cotton ball in the spoon, pull back gently, and launch.
* Measure how far the cotton ball travels from the catapult to where it first hits the ground.
* Record the distance (in cm) in your data table.

**Step 2: Test at 45°**

* Adjust your catapult’s launch angle to 45 degrees.
* Launch again, measure the distance, and record it.

**Step 3: Test at 60°**

* Tilt your catapult to a 60-degree angle.
* Launch, measure, and record the result.

**Record Your Results Below:**

| **Launch Angle** | **Distance Traveled (cm)** |
| --- | --- |
| 30° |  |
| 45° |  |
| 60° |  |

**Think About It:**

→ Which launch angle helped the cotton ball travel the farthest? Why do you think that angle worked best?  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Wrap-Up Reflection:**

1. What did you learn about force and motion today?  
   → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How did your catapult change stored energy into motion?  
   → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. If you could make a super-powered catapult, what would you add or upgrade?  
   → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Standards Alignment

NGSS: 3-PS2-2 STEL**:** STEL 1B, STEL 2B, STEL 4B, STEL 5A, STEL 7B, CCSS: CCSS.MATH.CONTENT.3.MD.B.4, CCSS.MATH.CONTENT. 4.MD.A.1, CCSS.MATH.CONTENT. 4.MD.A.2, CCSS.MATH.CONTENT. 5.OA.B.3