**📍 Station 1: Build It!**

**NGSS: 3-5-ETS1-1 – Engineering Design (Building under constraints)**

🛠️ **Materials:**

* 7 craft sticks or popsicle sticks
* 4 rubber bands
* 1 plastic spoon
* Cotton balls or pom-poms (projectiles)
* Measuring tape or ruler
* Target (paper cup or printed bullseye)
* (Optional) masking tape, clipboard, or tray

👣 **Student Directions:**

**Step 1: Build the base of your catapult.**

1. Stack **5 popsicle sticks** neatly on top of each other.
2. Wrap **1 rubber band tightly** around each end to hold them together.
   * ✅ This is your **base block**.

**Step 2: Add the launch arms.**

1. Take the remaining **2 sticks** and stack them together.  
2. Gently pull the two sticks apart in the middle to form a **V-shape** and slide them **between the 5-stick base**, making a cross shape.

* It should look like the top 2 sticks are “biting” through the middle of the base.

**Step 3: Add the launching spoon.**  
1. Use a rubber band to **attach the plastic spoon** securely to the **top stick** of the V (the launching arm).

* Make sure the spoon bowl is facing upward and sticks out over the end.

**Step 4: Secure the structure.**  
1. Use the **last rubber band** to secure the **2 V-sticks** to the base block.

* Wrap it around the intersection where the V-sticks meet the base to keep the whole thing tight and sturdy.

**Step 5: Test for stability.**  
1. Press down lightly on the spoon to see how far it goes and make sure the base doesn’t fall apart.

* If it’s wobbly, add more rubber bands or ask for a tray/clipboard to tape it down.

**🖼️ Sketch Your Catapult Design Below**

(Draw and label each part of your catapult: base sticks, V-sticks, spoon, rubber bands, etc.)  
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📍 **Station 1: Build It!**  
🔬 **NGSS Connection:** 3-5-ETS1-1 – Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

✅ **ITEEA STEL Standards – Elementary School**

**STEL 1B** – Technologies are developed to meet human needs and wants.  
 → Students create a catapult to solve a design challenge using limited materials.

**STEL 2B** – The core concepts of technology (systems, resources, and processes) apply to all technological activities.  
 → Learners use materials and simple systems (like levers and tension) to make a functioning device.

**STEL 4B** – The engineering design process includes defining the problem, generating ideas, testing, and refining solutions.  
 → Students build a catapult, test for stability, and modify if it doesn't work, simulating the engineering cycle.

**STEL 5A** – Asking questions and gathering information helps solve problems.  
 → Students evaluate their design’s success and stability, learning from trial and error.

**STEL 8A** – People apply science, math, and engineering to solve problems.  
 → Students use measurement tools (like rulers) and apply physical science concepts (force and motion) in their builds.

✅ **Common Core Math Standards – Elementary School**

**3.MD.B.4** – Generate measurement data and show measurements by making a line plot.  
 → Students may measure how far their catapult launches a projectile and record that data.

**3.G.A.1** – Understand and identify shapes and their attributes.  
 → Students identify and construct geometric shapes (triangles, rectangles) while assembling the catapult.

**4.MD.A.1** – Know relative sizes of measurement units within one system of units.  
 → Learners measure with tools like rulers or tape measures to check dimensions or setup.

**5.MD.B.2** – Make a line plot to display a data set of measurements.  
 → If used with a follow-up activity, students could graph distances launched to analyze their design's effectiveness.

💡 **Summary:**  
This station gives students a hands-on opportunity to apply engineering, problem-solving, and math measurement skills while building a simple device. It emphasizes building under constraints, iterative thinking, and real-world application of math and design concepts—all foundational for STEM learning in upper elementary grades.