

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

### Catapult Design Worksheet

**Problem:** You are an engineer who specializes in designing cool toys and machines for games. You were recently contacted by the SuperFun Toy Company to help design a machine called a catapult for a game that will launch Ping-Pong balls at a series of targets. To ensure that children and adults alike will love the game, you need to make sure the catapult is both accurate and precise. It should also be small and portable. You must also think about the cost of the toy. Keep the cost down to make it affordable for all.

**Constraints/Specifications:** The only building materials available to you are listed below. Your budget is limited to \$3.00 for your finished product, this means that the total cost of building the finished product must not be more than \$3.00. The size of your catapult is limited to the size of the cardboard base you are given. It should fit on the base.

**Materials/Cost:**

Popsicle Sticks (\$0.10 Each)

Rubber Bands (\$0.30 Each)

Masking Tape (\$0.20 per 5 inch pieces)

Plastic Spoons (\$1.00 Each)

Straw Piece (\$0.20 Each)

Cardboard Base (1 per group, no cost but you only get one)

**Imagine:** Brainstorm several ideas you have for how to use the above materials in YOUR catapult. Draw pictures! Don't forget to add up the cost of the materials.

**Pugh Chart** – Use the chart below to determine which design is the best based on the criteria below. Use a scale of 1-5 for each criterion for each design. (5 = most important)

Criteria	Student Design 1	Student Design 2	Student Design 3	Student Design 4	Student Design 5
Budget					
Durability					
Aesthetics					
Comparison- Sum					

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**Design:** After using the Pugh Chart, Draw out your group's best catapult design. Be sure to label where you will use all of the different materials (Popsicle sticks, tape, plastic spoon, etc.).

**Create/Build:** List how much of each material you will need to build your catapult. Once your design and materials list are complete, you may collect materials from your teacher. Make sure you labeled the materials in your design!

Item	# needed	Total Cost
Cardboard Base	1	1 x \$0.00 = \$0
Popsicle Sticks		x \$0.10 = \$
Masking Tape		x \$0.20 = \$
Straws		x \$0.20 = \$
Rubber bands		x \$0.30 = \$
Plastic Spoons		x \$1.00 = \$
		<b>Total cost of catapult =</b>

**Test/Improve:** After building your group's final design you will test the design by completing the task assigned by your teacher. After you have tested your catapult answer the questions below.

1. Did your catapult work the way you intended?
2. Does your catapult launch the Ping-Pong ball too far past the target or too far to the right or left?
3. What are two ways you can change your catapult to make it better?

Right on Target: Catapult Game activity – Catapult Design Worksheet 2

[https://www.teachengineering.org/activities/view/cub\\_catapult\\_lesson01\\_activity1](https://www.teachengineering.org/activities/view/cub_catapult_lesson01_activity1)