

Name: \_\_\_\_\_

Partner(s): \_\_\_\_\_

# Marshmallow Catapult

Can you create a catapult that will launch a mini-marshmallow? Can you launch your marshmallow further than other groups? Your challenge is to create a catapult from popsicle sticks that will give your group the best launch possible.

## Materials

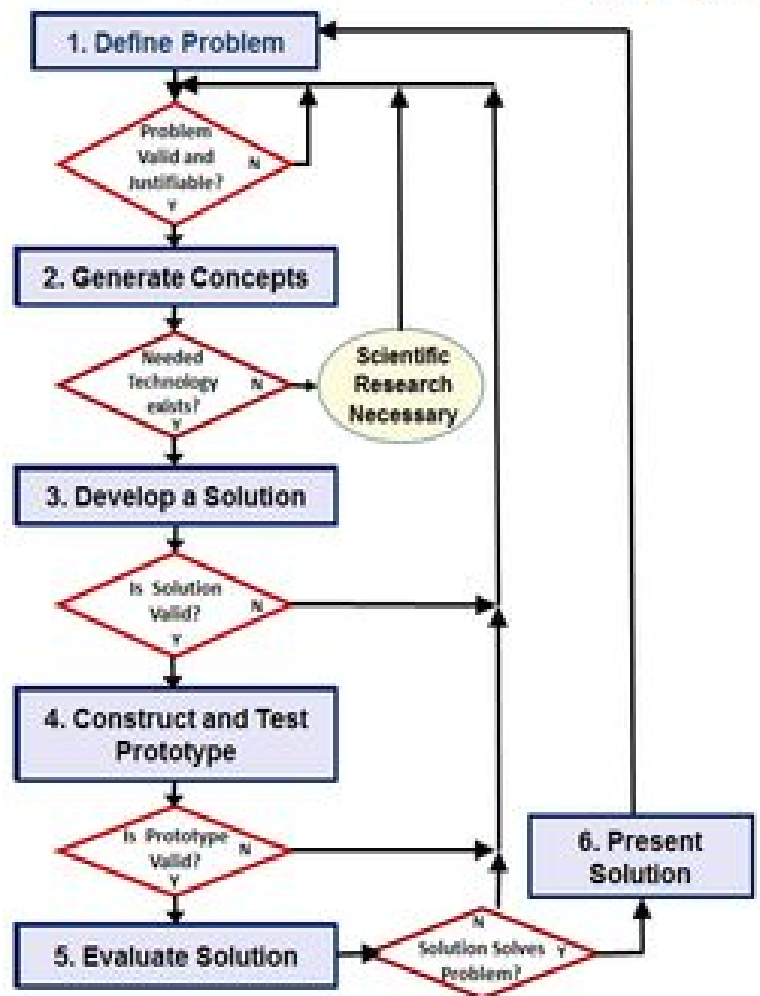
You may choose any of the items below for your design. In addition, you may use rulers to measure, markers/crayons/colored pencils to decorate, and scissors to cut.

- 20 Popsicle Sticks
- 4 Rubber Bands
- 1 Pop Bottle Top (get from home)
- Mini Marshmallow
- Hot Glue Gun with Glue (one per class)
- Masking tape (team names/distance marker)
- Student Instruction Sheet

## Important information

1. You will go through each step of the design process with your partner(s) and record what you do for each step.
2. You will be graded on: teamwork, entries in your notebook, your design (labeled), your conclusion questions, and how well you followed the design process
3. Only the allowed materials may be used (listed above).

## A Design Process



# Notebook Checklist

## Design Problem (Design Brief) \_\_\_\_\_

1. Client
2. Designers
3. Problem Statement
4. Constraints
5. Deliverables

## Generate Concepts

### Brainstorm \_\_\_\_\_

1. What do you know about each of these materials? List pros and cons.
2. What materials would you like to use?

### Research \_\_\_\_\_

1. Define potential and kinetic energy.
2. What *form* of energy are you going to use?
3. Cite at least one website and sketch an idea from the website you used

## Develop a Solution \_\_\_\_\_

Individually, come up with one designs for your catapult. Make sure you label the materials that you are planning on using and the measurements.

### Decision Template \_\_\_\_\_

Glue in to notebook

## Construct and Test \_\_\_\_\_

Draw you groups initial design. Be sure to include labels and measurements.

## Evaluate your Design \_\_\_\_\_

1. How did your group improve your initial design? (At least four modifications)
2. Draw and label your final design (colored pencil on design)

## Present your Solution \_\_\_\_\_

Write down how far your marshmallows traveled in a data table.  
Find the average distance.

# Catapult Decision Template

1. In the criteria boxes list the criteria from your design brief.
2. Under the ideas boxes put your idea(s) and your partner's idea(s) – label the sketches A, B, C, and D.
3. Evaluate the design idea for each criteria. For a yes or no response to the criteria, use 1 if the answer is no, 2 if the answer is yes. When assessing a criteria, use the scale between 1 and 4, 1 -2 means it almost or definitely does not meet this criteria, 3 - 4 means it almost or definitely is the best possible solution to the problem for this specific need.
4. When you finish evaluating your sketches add the numbers across and put your answer in the Total column.
5. The design with the highest total is your Best Solution.

	Criteria						
Ideas							Totals
A Designed by:							
B Designed by:							
C Designed by:							
D Designed by:							

# Analysis Questions

1. What was the most difficult part of the design process? Why?
2. Do you think the catapult arm was a good length or should you have made it longer/shorter? Why?
3. What sized wedge is acceptable in this challenge? Should it be more or less than 3 sticks? Why?
4. Where was the weakest part of your catapult? Explain what happened.
5. What part of the catapult design was a success? Explain why.
6. What would you do differently next time? Explain why.
7. If I were to give you three extra resources, what would you use and how would you design your catapult?

# Participation/Cooperation

1. How would you rate your participation and cooperation on a scale of 1-5? Why?

---

---

---

2. How would you rate your partner(s) participation and cooperation on a scale of 1-5? Why?

---

---

---

3. What is one thing that went well and one thing that did not go well in your group? Explain why.

---

---

---

## Rubric

Grading Category	Points Available	Student Grade	Teacher Grade
Design Plan	40		
Analysis Questions	15		
Participation	5		
Focus on Task	5		
Length of Travel	10		
Available Points	75		

Student Comments: \_\_\_\_\_

Teacher Comments: \_\_\_\_\_