**STOMP ROCKETS**

Dear Student,

You will create headings in your lab journal and record content beneath.

You will complete each step as assigned, so please do not create all headings yet.

The following table outlines each section, the required contents, and point value.

The purpose of this lab is for you to apply the concepts of physics to design and build a stomp propelled rocket that will travel the farthest distance possible.

**Project Info**

**Information for Background**

Physical Science Textbook [NASA 1](https://www.grc.nasa.gov/www/k-12/UEET/StudentSite/dynamicsofflight.html) [NASA 3](https://solarsystem.nasa.gov/basics/chapter3-2/)

[PDF materials](https://drive.google.com/file/d/1mQCjRngpnIU6oZZGCyH-lwuL6SLun2c6/view?usp=sharing)  [NASA 2](https://www.grc.nasa.gov/www/k-12/rocket/TRCRocket/rocket_principles.html#:~:text=In%20rocket%20flight%2C%20forces%20become,and%20the%20rocket%20travels%20upward.)

**Materials**

| **Consumables- Use for Rocket** | **Building Materials-Not in the Rocket** |
| --- | --- |
| * up to 2 sheets of paper 8.5” x 11” (construction or printer paper) * tape * 1 sheets of 8.5” x 11” card stock for fins and nose cone | * Scissors * Markers for decorating (optional) * 40 cm of ½ PVC pipe (for forming the shape only) |

**Launch Details**

-stomp rocket launcher at 45 degree angle

-best of 3 trials with no access to materials bucket

| **Section Heading** | **Content Requirements** | **Point Value** |
| --- | --- | --- |
| **Title**  **Team Name**  **Team Members** | Stomp Rockets centered at top of first page  Create a name for your team  List the other members of your team | 1  1  1 |
| **Claim** | To apply the concepts of physics to design and build a stomp propelled rocket that will travel the farthest distance possible. | 2 |
| **Background Research** | List and describe the four forces that affect flight. (2 pts each)  Include a diagram with descriptions (1 pt each)  Describe how Newton's Three Laws apply to:  Launching of the Rocket  Flight of the Rocket | 8  4  4  4 |
| **Identify the Criteria and Constraints** | What requirements does your design need to fulfill?  What will constrain (or hold back) your design?  Lists are fine, you should have at least 4 of each. | 4  4 |
| **Brainstorm Ideas** | Record ideas for your design.   * Include how the design addresses the forces of flight, Newton's Laws, the criteria and constraints. * What features will your design include to deal with these forces? Why? | 4  4 |
| **4 points =** Provides appropriate and sufficient (enough) evidence to the prompt. Includes specific reference to readings, lessons, discussions. | | |
| **Evaluate Ideas** | Choose the best design and record why it was chosen as the first design. | 4 |
| **4 points =** Provides appropriate and sufficient (enough) evidence to the prompt. Includes specific reference to readings, lessons, discussions. | | |
| **Test Solution(s)** | Draw your first chosen design.  After testing, record positives and negatives.  Repeat for each new solution. Draw, test, describe.  (5 pts/day) | 25 |
| **Final Solution** | Draw, measure, describe your final design  Create a hypothesis:  The rocket will reach a distance of \_\_\_\_\_\_\_\_\_\_\_ feet, because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | 5  3 |
| **Data and Observations** | Create the data table as shown below.  Record the maximum distance attained by your rocket  Record the mass, length, and description of your rocket | 5 |

