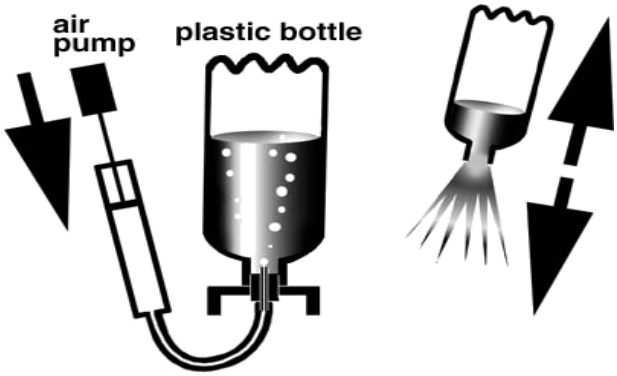
Challenge: Each student in the class has the task of designing a water bottle rocket that will later be built and tested outside to determine its efficiency and quality of build.

Each group will need the following materials to complete their rockets:

- ☐ 2 Liter Soda Bottle
- ☐ Materials for Fins
- ☐ Materials for the Cone of the Rocket
- ☐ AutoCAD



Design Process

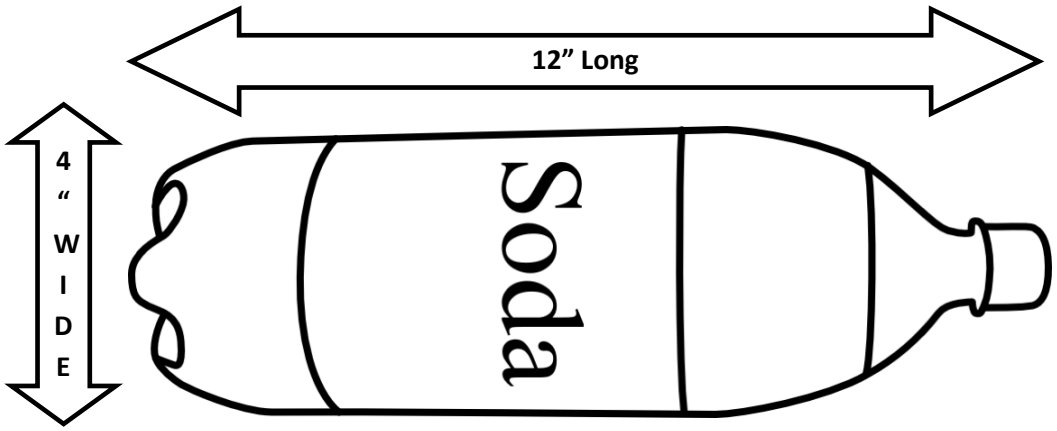
Research – Students will spend time on NASA's website along with other websites to research the best possible designs for their rockets. You will use this information to create (2) designs of your rockets.

Design – Students will need to complete two possible rough sketches of their rocket along with a final design drawn to scale in AutoCAD. Students will also need to print out pictures that were used to inspire designs.

Construct – During the 3rd and 4th Marking Periods, students will be starting to assemble their rockets using materials that they bring from home and can find in the production lab.

Evaluate – Students will be using a measuring tape and an altimeter gun to calculate the approximate altitude of their rockets. We will also discuss possible modifications to the designs.

Soda Bottle Dimensions



Bottle Rocket Design 1 – Research designs for your rocket by looking at pictures and other designs

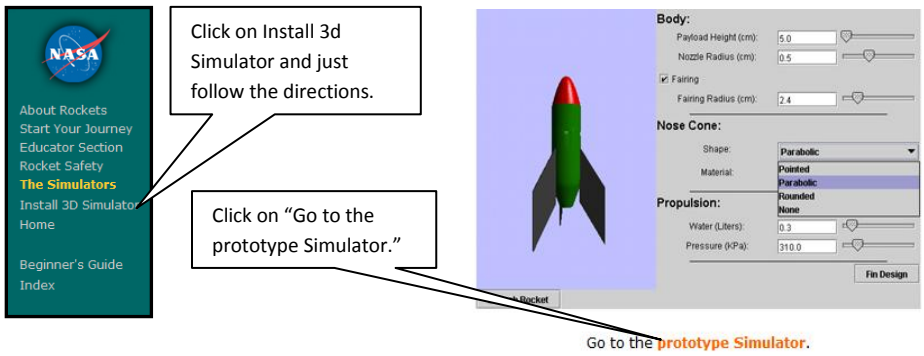
Bottle Rocket Design 2 - Research designs for your rocket by looking at pictures and other designs

Rocket Design

Students will need to do some research into the best possible fin designs for their rockets. There are many different types of rockets and each uses different fin configurations to get a desired effect. Students will also need to visit NASA's rocket website to try different configurations to see what will work before they settle on their two designs.

NASA Site: http://exploration.grc.nasa.gov/education/rocket/BottleRocket/journey.htm

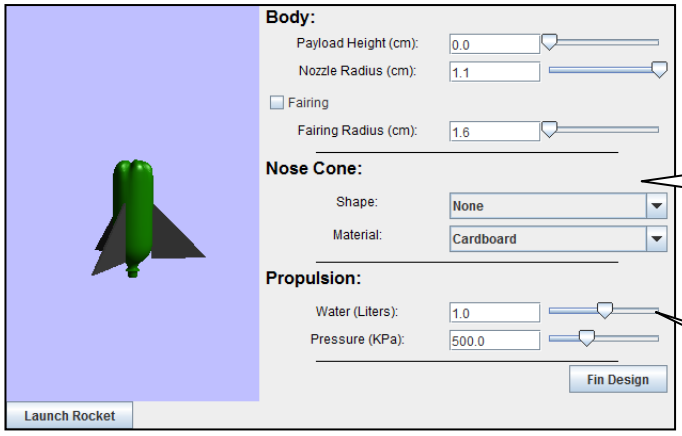
Follow these steps to setup the 3d Simulator:



Now, just experiment with different cone shapes, and rocket sizes.

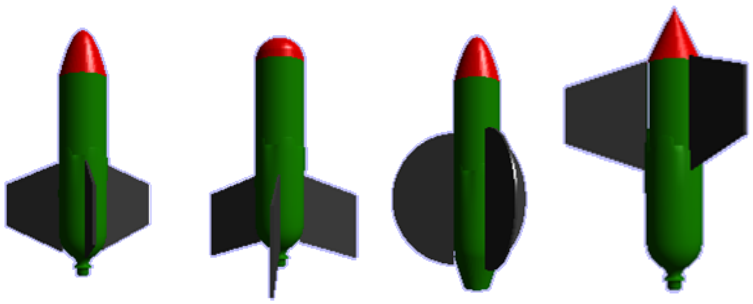
Use these models to help you develop your two designs

Example 3d Model – Use the ones you create to influence your designs.



You can actually see what the fin shapes, the cone shapes, and the size of the payload do to the launch capacity for the rocket.

Keep the settings for the propulsion section the same as default.



AutoCAD Final Design

You will need to choose one of your two designs and draw it to scale using AutoCAD. Remember, this will be the final design that you can use to develop your rocket. If your rocket differs at all from your AutoCAD design you will lose points.