

# Straw Rockets

Engineering Studies – Aeronautics

Modern rocket design began near the beginning of the 20th century. While much has been learned and rockets have grown larger and more powerful, rocket designs are still improving. Engineers developing new rockets must control variables and consider failure points when improving rocket designs. By changing one variable at a time, engineers can determine if that change leads to an increase or decrease in performance. They must also consider how their design might fail, and work to improve their design. These incremental changes allow engineers to improve rocket performance and increase the amount of mass they can lift into space.

## Procedures



Have students carefully cut out the large rectangle on the rocket template. This will be the body of the rocket. Have them wrap the rocket body around a pencil length-wise and tape it closed to form a tube.



Tape the fins at the base of the rocket body to make a "fin sandwich."



Bend each fin 90 degrees.



Twist and pinch the top of the rocket body around the tip of the pencil to create a "nose cone" for the rocket. Tape the nose cone to prevent air from escaping and to keep it from untwisting.

Measure the nose cone from its base (right where it starts to narrow) to its tip, and record the length in their data log and on the rocket itself. (Once completed, the rocket will be about 130 mm tall.

Remove the pencil and replace it with the drinking straw.

In the designated launch area, away from people and other hazards, blow into the straw to launch their rocket.

Use the metre stick to measure the distance it travels, then record the distance on a spread sheet.

Next, try improving the design! Make new rockets by altering the template. Try different rocket lengths, fin shapes or fin angles. Repeat the steps above for every launch, having students record each design change and rocket-flight distance in their spreadsheet.