

Inquiry Question

Do you have the makings of a future "Rocket Scientist"? Can you design and build a simple rocket so that it effectively completes a given task?

Name: _____

Date: _____

Rockets have been around for a long time. They are often considered to be examples of "controlled explosions". Can you build one? How do Newton's Laws come into play?



General Instructions

Students are to build a balloon rocket to meet the standards outlined below.

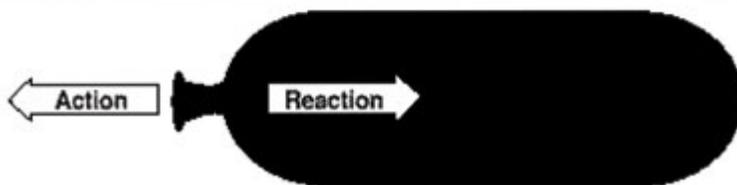
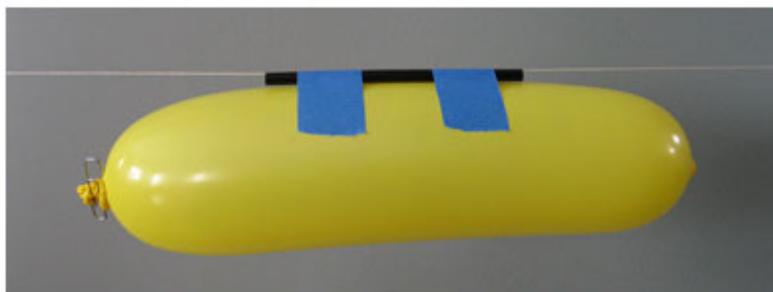
Materials you'll need:

- Your course notes
- The internet
- strong, smooth fishing line stretched tightly between two points at least 6m apart.
- one balloon of your choice
- tape if you need it
- two loonies that must be carried by your rocket the entire length of 5m.
- a means to attach your balloon to the line so that it glides along in the right direction (straws work well for this)
- tape if you need it
- paper "fins" (perhaps)

Procedure:

Part 1:

The student is to design a Balloon Rocket that will glide on a string from one end of a room to another. Every design modification should be recorded along with an explanation as to why the modification was made in terms of Newton's Laws. Ultimately we are looking for a Balloon Rocket that with carry a payload of two "toonies" a distance of 5 metres in the shortest time possible.



Part 2:

Modify your balloon so that it spirals around the string as it crosses the room.

Ideas and Hints

- Try a variety of balloon shapes and sizes to see what works best.
- You may need a way to control the airflow from your deflating balloon (perhaps some sort of rocket booster nozzle?).
- Make sure that your line is completely horizontal.

Project submission:

- If you can drop-in to the school, you can present it to your teacher in-person. Otherwise, scan or take a photo and upload it to the project submission folder at the end of the unit.

Project Timing:

- In its most basic form, this project will take the average student 2 hours. Locating and collecting all of the necessary materials will vary.

Inquiry Questions and Experimental Design:

1. Keep a log of all of your attempts and modifications. You may use a table like the one shown below. You may take photos of each version or videotape your final designs for submission.

Trial	Sketch (fully labeled)	Results of attempt (times and distances traveled)	Modifications needed (one at a time for good science)	Reason for modification (in terms of Newton's Laws)
1				
2				
3				
4				

2. Make a set of instructions describing how to build your rocket.
3. Rank each modification made in order of importance (i.e Which modification had the biggest impact on the success of your rocket?)
4. Discuss how each of Newton's three Laws played a role in the operation and design of your rocket.