

TRB 3:3 - Investigation 5 - Balloon Rockets

Summary

Students will make a balloon rocket and learn about the relationship between the force applied to an object and the resulting motion.

Group Size

Individual

Materials

- [Balloon Rocket Observation Log](#) (pdf)

Activity 1, 2 & 3

- Long balloon
- Straw
- String
- Paper cup
- Nuts and bolts
- Tape
- Stopwatch

Straw Rocket Activity

- Soft plastic bottle, with a pop-up lid
- Modeling Clay
- Two straws (one smaller than the other one in diameter)
- Scissors
- Rulers

Additional Resources

Books:

- *Tell Me How Fast It Goes*
(Whiz Kids) by Shirley Willis (Franklin Watts)
- *Feel the Wind*
by Arthus Dorros (Children's Book)
- *The Berenstain Bears Science Fair*
by Stan and Jan Berenstain (Random House, Inc.)
- *Gizmos and Gadgets: Creating Science Contraptions that Work and Knowing Why*
by Jill Frankel Hauser (Williamson Publishing)
- *Forces*
by Graham Peacock (Steck-Vaughn)

Laser Discs:

Windows on Science, Primary Vol. 3, Force and Motion Lessons 6-10, 14-17

Background for Teachers

The balloon is made of rubber and has shape that it prefers. It will return to that shape when it can. When the balloon is inflated, the rubber is stretched way past where it wants to be. As soon as it gets a chance, the rubber will push the air out of the balloon and return to its original shape.

Intended Learning Outcomes

1. Use a Science Process and Thinking Skills

2. Manifest Scientific Concepts and Principles
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning

Instructional Procedures

Pre-Assessment/Invitation to Learn

Tell students the balloon is lazy. It likes to stay flat and lifeless". Have a volunteer blow up the balloon. Ask the students what the lazy balloon wants to do. Does it want to return to its "lazy" state? Tell the students that they are going to get a lazy balloon to do some work before they let it resume its flat, lifeless state.

Instructional Procedure

Activity 1

Thread a piece of string through a straw.

Attach the ends of the string to the ceiling and the floor. (You can also have a child stand on the chair and hold the string.)

Tape an inflated balloon to the straw.

Predict what will happen when you release the neck of the balloon and how fast the balloon will travel.

Do the experiment and observe what happens. Time how quickly the balloon rocket goes up the string. Design a chart to record the results.

Activity 2

Attach three strings to a paper cup.

Tape the strings to the inflated balloon so that the cup is suspended like a gondola beneath it.

Predict what will happen when you release the neck of the balloon. Predict how fast the balloon will travel.

Do the experiment and observe what happens. Time how quickly the balloon rocket goes up the string. Record the results.

Activity 3

Do experiment 2 several times, but now add weight (nuts and bolts) to the paper cup. Use a different weight each time you launch the rocket.

Predict what will happen to the balloon rocket as more weight is added.

Predict the maximum weight the balloon rocket can lift.

Do the experiment until the balloon rocket will no longer lift-off.

Record the results.

Extensions

Language Arts-

Create a Venn Diagram comparing the different balloon flights. How were they the same? How were they different? (*Standard VII, Objective 2*)

Science-

Make a Straw Rocket (*ILO 1*)

Cut both straws 6" in length.

Make four 3/8" slits around one edge of the smaller diameter straw.

Bend the four sections out (should look like an X or a + sign).

With the cap closed, place the slit end of the smaller straw in the center of the lid. Secure in place with the clay. This is your launch pad.

Make a nose for the rocket (large diameter straw) with a small amount of clay.

Slide the rocket over the launch pad.

PREDICT what will happen when the plastic bottle is squeezed firmly.

Actually squeeze the bottle and OBSERVE what happens.

Does it make a difference how hard you squeeze the bottle? Try it to find out.

Homework & Family Connections

Have the students make a straw rocket at home.

Assessment Plan

Did the students complete the Balloon Rocket Observation Log accurately? Were their predictions accurate as they filled out the chart?

Authors

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