

Classroom Activity: Fast and easy straw paper rocket

Subject: Science/rocketry

Grades: 6-8

Standards: See end of lesson plan.

Time: about 15 minutes

Materials: paper, pencils, scissors, tape, straws

Lesson Objective: The student will learn the parts of a rocket and how they affect rocket flight. Students will develop, design, and test experiments. Students will understand how Newton's first and third laws are represented by rocket flight.

Procedure:

This activity can introduce the parts of a rocket and how they work. This activity can also be used to develop experimenting and inquiry skills. You can use Newton's laws to describe what is happening.

Law 1: Every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it. The law is represented because the rocket is simply still until someone applies a force by blowing through the straw, the rocket then stays in flight until a force acts upon it again, gravity.

Law 3: For every action there is an equal and opposite reaction. The law is represented because the action of blowing in the straw creates the reaction of the rocket moving.

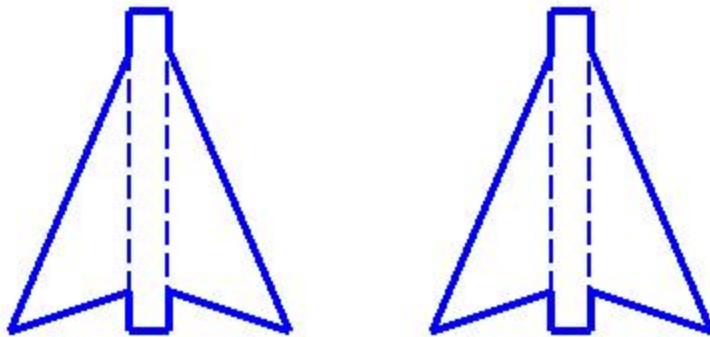
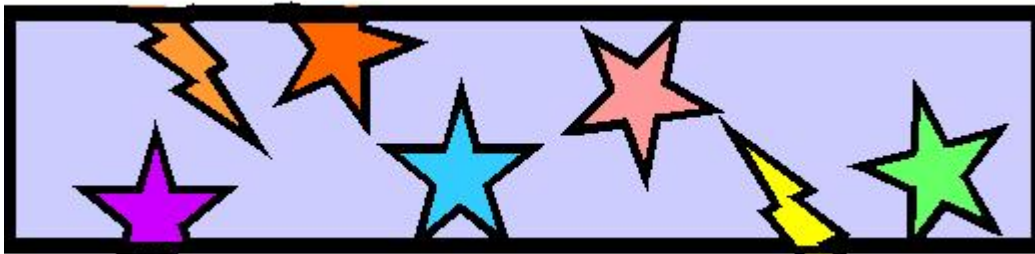
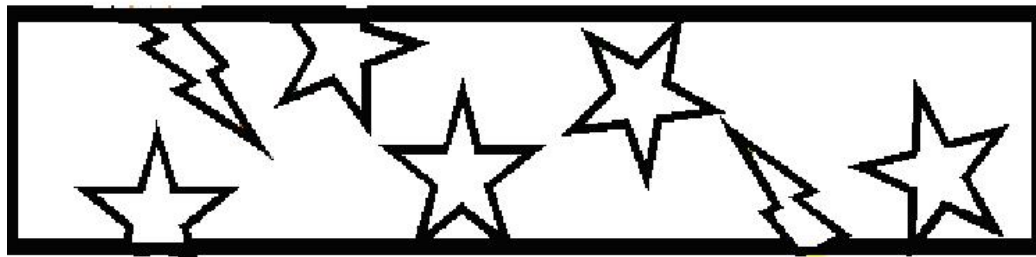
There are three different patterns you can use for the rocket body, print them out or cut them according to your needs. If you want to color print, students could use the pre-colored rectangle. You could have them color the blank designed rectangle, or there is a totally blank rectangle also provided in case you would like for the students to design their own.

Once students have made their rockets, use your imagination (or the students' imaginations!) to do mini-experiments. See who can launch it the highest or farthest. See if students can hit a particular target. Try different ways of building the rockets and watch what happens. For instance, leave the fins off and compare the flight of the finless rocket to the finned one. Or move the fins around, change the shape of the fins, change the shape of the nose cone, etc.

Assessment:

You could assess this activity by participation or by how well the rocket works. You could also take into account how well the student followed instructions and how well their rocket is made. You could also assess students' knowledge of Newton's laws.

Cut along the solid lines. Fold on the dotted lines.





1. Cut out the rectangle and fins from your paper.
2. Follow your teacher's directions about how to decorate your rocket.
3. Fold the fins upwards towards you on the dotted lines.
4. Wrap the rectangle around your pencil and tape it along the seam.
5. Remove the pencil from the paper cylinder and cut a point into one end of the cylinder to make the nose cone of the rocket.
6. Put the pencil back inside the cylinder and tape up around the point where you have cut the cylinder. Don't tape it to the pencil though; you're just using the pencil for support.
7. Pull the pencil out again and blow through the open end of your rocket. If too much air escapes, tape up the rocket better.
8. Attach the fins to the bottom of the rocket. Apply tape to the straight middle piece of the fin to tape it to the body of the rocket.
9. Insert the straw into your rocket and blow into the straw to launch the rocket!
10. Follow your teacher's directions about launching the rocket and cleaning up your area.

Standards addressed:

6. IV. Physical Science

C. Energy is transferred in many ways.

1. Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, and the nature of a chemical.

a. Identify sources of heat, light, sound, electrical and chemical energy, and mechanical motion.

b. Recognize and identify heat, light, sound, electrical and chemical energy, and mechanical motion as forms of energy.

2. Energy is transferred in many ways.

a. Demonstrate how mechanical energy is transformed to another form of energy (e.g., vibrations, heat through friction).

8. IV. Physical Science

A. Motions and Forces

2. An object that is not being subjected to a force will continue to move at a constant speed in a straight line. If more than one force acts on an object along a straight line then the forces will reinforce or cancel one another depending on their direction and magnitude. Unbalanced forces will cause changes in the speed or direction of an object's motion.

a. Analyze the direction and effects of forces in a variety of situations (e.g., gravity and friction).

b. Compare and contrast forces that are balanced and unbalanced.

d. Analyze the effect of an unbalanced force on an object's motion in terms of speed and direction.

e. Analyze the effect of balanced forces on an object's motion in terms of speed and direction.

f. Predict what happens to an object at rest or an object in motion when unbalanced forces act upon it.

g. Apply Newton's Laws of Motion to the way a rocket works.