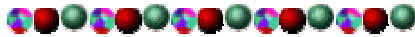




Program: Balls, Ramps, Rolling Things

Pre-Visit Activities

Grades K-2



Revised 10/06

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Standards of Learning

The following Standards of Learning are addressed in the Balls, Ramps, and Rolling Things Program:

Science

K.3 The student will investigate and understand that magnets have an effect on some materials, make some things move without touching them, and have useful applications. Key concepts include (a) attractions/non-attraction, push/pull, attract/repel, and metal/nonmetal; (b) useful applications (refrigerator magnet, can opener, magnetized screwdriver, and magnetic games).

K.4 The student will investigate and understand that the position, motion, and physical properties of an object can be described. Key concepts include (a) colors (red, orange, yellow, green, blue, purple), white, and black; (b) shapes (circle, triangle, square, and rectangle) and forms (flexible/stiff, straight/curved); (c) textures (rough/smooth) and feel (hard/soft); (d) relative size and weight (big/little, large/small, heavy/light, wide/thin, long/short); and (e) position (over/under, in/out, above/below, left/right) and speed (fast/slow).

1.2 The student will investigate and understand that moving objects exhibit different kinds of motion. Key concepts include (a) objects may have straight, circular, and back and forth motions; (b) objects may vibrate and produce sound; (c) pushes or pulls can change the movement of an object; and (d) the motion of objects may be observed in toys and in playground activities.

2.2 The student will investigate and understand that natural and artificial magnets have certain characteristics and attract specific types of metals. Key concepts include (a) magnetism, iron, magnetic/nonmagnetic, poles, attract/repel; and (b) important applications including the magnetic compass.

Activities

These activities are intended for use before your visit to the Virginia Air and Space Center. It is beneficial for the students to have some prior knowledge about the content area covered in the program. All of the activities can be tailored to your specific classroom needs, and procedures listed are suggestions for teaching.

Activity 1: Do all Round Things Roll?

Prep- You will need to collect a variety of items that are round. For example: sports balls, container lids, round pieces of cardboard, wheels, large buttons, balloons, etc., and containers or baskets to put all of these materials in. Separate the different items into the containers making sure to give each container a variety of the items. You will also want to put your students in groups, and give each group one of the containers. Each group will also need a sheet they can document their findings on. Here is an example:

Group Name: _____

Predictions: Circle the predicted action for each item **before** testing them out.

Button	ROLL	WILL NOT ROLL
Cardboard	ROLL	WILL NOT ROLL
Wheels	ROLL	WILL NOT ROLL
Ball	ROLL	WILL NOT ROLL

* The second half of the sheet should be for the Conclusion. You will set it up the same way. When your students have completed their investigation on which objects rolled and which didn't, they can compare and contrast their hypothesis.

Intro: Open the activity by asking your class, "Do all round things roll?" Accept all answers. Then ask, "Do all square things roll?" Most of them will answer no. Then ask your students, "How do you know all square things don't roll?" We know that all square things do not roll because of observation. Explain to your students that scientists learn and draw conclusions using observation and experimentation. Tell them you need their help with an experiment. Explain that you want them to observe and decide if all round things roll. Then have each group experiment and complete their worksheet. Discuss each group's findings with the class. Did every group have the same answers? Why?

Extension: You can elaborate on this activity by asking students, "What may have caused the ball to roll or not roll?" "What made some items roll faster or slower than others?" This will get the class thinking. Then ask, "Will the same items roll faster or slower on the carpet versus a smooth surface like their desk tops?" This will get your students thinking about different surfaces and friction.

Activity 2: Magnets and their Forces

Prep- Here is a list of items that will be needed for this activity: Assorted paper clips, coins, key chains, pencils, erasers, aluminum foil, marbles, rubber bands, plastic spoons, metal spoons, and straws. (Depending on your class some of these items may need to be eliminated.) Any items will work. You need to have a variety of magnetic and non-magnetic items. You will also need an assortment of magnets.

Start a discussion about magnets by asking your class to give you some descriptive words about magnets. You will get descriptive words like: stick, pull, hold onto, and so forth. Then ask, "Do magnets ever push or repel things?" Explain that just like the earth which has north and south poles, magnets have a north and a south pole. The poles of the magnet determine whether it will attract or repel something.

Start the activity by asking your students to draw a hypothesis on which items will be attracted or repelled by the magnets. Then have each student experiment with the different items to determine which ones are magnetic and which ones are not. Ask your students, "Do magnets have force?" Yes they do because they push and pull.

Extension: Ask students if they can name any other push or pull forces that they know of. Then have all of your students stand up. Ask the group "Who thinks they are so good at *Simon Says* that they can never lose?" Tell your class that you can get every single one of them out of the game in one try. Your students will laugh in total disbelief. Explain to them that you will be nice enough to give them just a couple of practice rounds before you knock them all out of the game. "Simon says touch your nose." "Simon says turn around in a circle." Then say, "Simon says jump up." When they all come back down, tell them that they are all out! They will look at you with puzzlement. Explain to them that "Simon said to jump up but he didn't say to come back down." This will introduce gravity. Ask your students, "What is the force that pulls us towards the ground?" Gravity!

Resources

Websites

http://pbskids.org/curiousgeorge/parentsteachers/activities/pc_ramp_n_roll.html

<http://www.nyu.edu/projects/mstep/lessons/magnets.html>

<http://homeschooling.gomilpitas.com/explore/machines4kids.htm>

http://familyfun.go.com/parenting/learn/activities/feature/famf199611_learnproj1/famfun199611_machanic.html

<http://42explore.com/smplmac.htm>

Books

Let's Try It Out With Towers and Bridges. Simon and Schuster. 2003.

Machines At Work. Byron Barton. 1987.

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