

TRB 3:3 - Investigation 1 - Push and Pull

Summary

Students understand the effect of the forces of push and pull on motion.

Group Size

Small Groups

Materials

5 washers

4 1/4" X 5 1/2" piece of paper

Music for "[Here We Go Round the Mulberry Bush](#)"

Additional Resources

Books:

- *Awesome Experiments in force and Motion*
, Michael DiSpezio, Sterling Publishing Co., Inc. ISBN 0-8069-9821-0.
- *Forces*
, Karen Bryant Mole, Rigby Interactive Library, 1997. ISBN 1-57572-108-2.
- *Forces and Motion*
, Harcourt School Publishers, 2002. ISBN 0-15-322921-7.
- *Forces and Motion*
, Teacher Created Materials, Inc. 2001 ISBN 1-55734-625-9.
- *Magic School Bus Plays Ball*
, Scholastic Inc. 1997 ISBN 0-590-92240-8.
- *Push and Pull*
, by Patricia J. Murphy (Scholastic Library Publishing).
- *Pushing and Pulling (Science For Fun)*
, by Gary Gibson (Copper Beach Books).

Laser Discs:

Windows on Science, Primary Vol. 3, Force and Motion Lessons 1-3, 5, 9-13

Windows on Science, Primary Vol. 3, Simple Machines Lessons 4-10

Windows on Science, Primary Vol. 3, Work and Machines Lesson 1-3

Videos: (Available from Jordan School District)

- *Forces: The Law of Motion*
(Disney, Bill Nye) #13027 26 minutes
- *Motion and Force: Play Ball*
(321 Contact) #10972 15 minutes
- *Force and Motion: Newton's Three Laws*
#07351 18 minutes

Background for Teachers

Force, which is simply a push or pull, is all around us. Objects at rest will remain at rest unless acted upon by a force. Objects in motion will remain in motion unless acted upon by a force (push or pull).

Intended Learning Outcomes

1. Use a Science Process and Thinking Skills
2. Manifest Science Interests and Attitudes

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

Instructional Procedures

Pre-Assessment/Invitation to Learn

- Place the paper on the edge of a table or countertop with most of the paper off the surface.
- Stack the washers on top of the paper.
- Hold onto the loose edge of the paper and quickly pull down on the paper.
- Observe what happens to the stack of washers.

If you pulled quickly enough, the stack of washers will stay stacked on the table. The coins are at rest on top of the table or countertop. When the paper is quickly pulled out from underneath them, they try to stay put.

Instructional Procedure

- Brainstorm with the students daily activities at school, at home, and at play that require a push and/or pull.
- Define "force" as a push or a pull.
- Play the game Charades. Students take turns acting out an activity that involves some kind of a force - either a push or a pull. The rest of the class guesses what action was portrayed and then tells whether the force used was a push or a pull.
- After each dramatization, use the action portrayed as new words for the song, "Here We Go Round the Mulberry Bush." Each time the students come to the last phrase in the song, end with the words "with a push or a pull in the morning." For example: "This is the way we put up the flag, put up the flag, put up the flag. This is the way we put up the flag, with a push or a pull in the morning."

Extensions

Art-

Have students fold a white paper into fourths. Mark each side with push on one side and pull on the other. Have the students draw four pictures of push with captions on the side and draw four pictures of pull on the other with captions. (*Standard IV, Objective 3*)

Language Arts-

Have students find some books about sports and/or outside games. Make graphic organizers of the pushes and pulls that happen in the activities. (*Standard VII, Objective 3*)

Science-

Whip a tablecloth out from under dishes. This bothers the tablecloth, but not the dishes. Hints: No hem on the tablecloth. Pull smoothly, quickly, and straight down. Use old and heavy dishes. (*ILO 1*)

Place a coin on your forearm. Drop your arm and catch the coin with your hand without dropping it. The coin will remain in place for a moment after your arm is removed. Now put two or more coins in a straight line on your forearm and try the experiment again. You can also make a pile of coins and try it again. (*ILO 1*)

Stack 6 wooden blocks on the countertop. Lightly hit the top block with a ruler, and observe what happens. Now try hitting the bottom block in the stack. Hit it hard and straight on, following through with the ruler after impact. Observe what happens. (*ILO 1*)

Homework & Family Connections

Materials:

- [Worksheet: Finding Forces](#) (pdf)
(one per student)

Have the students observe and list ten different activities performed by various family members in the first column. In the second column, students classify the force used as a push and/or pull.

Assessment Plan

Question the students about the difference between a push and a pull.

Name some common tools the students know about. Have them write down if they would push or pull that tool.

Name some activities the students play outside. Have them write down if they would push or pull during that activity.

Authors

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