TRB 5:4 - Activity 2: Will it Hold a Charge?

Summary

Students will conduct experiments to investigate what types of objects can be statically charged.

Materials

- Kit #1
- Kit #2
- tissue paper pieces
- eraser crumb
- yarn pieces
- sawdust
- paper dots
- puffed rice (housed in individual snack-sized plastic locking bags)

Additional Resources:
Books:
Edison Etc. by B.K. Hixson
Make it Work! Electricity by Alexandra Parsons ISBN:0-590-54461-6
Lightning by Seymour Simon ISBN:0-590-12122-7
Lightning! And Thunderstorms by Mike Graf ISBN:0-689-82018-6
Magazine:
THE MAILBOX • Intermediate •Feb./Mar.1998

Background for Teachers

Kit #1 refers to the kit used in the previous lesson. Small groups of three or four may share kits. Not all things will accept or hold a static charge in the same way. The activities in this section will demonstrate how to create a greater charge and why some items are better able to hold a charge. Materials such as wool, silk, flannel, and fur or hair will hold a charge well, as will items made of rubber, glass, and plastic.Conductors of electricity (such as metal) do not hold a charge well.

Intended Learning Outcomes

1-Use science process and thinking skills.
4-Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn:
Ask the student to make predictions about the answers to questions like the following: Will all materials hold equal static charges? What types of items will hold the greatest charges? Does the type of material used have an effect on the production of a static charge?
Review the previous lesson and activities with the students. Emphasize that like charges repel and opposite charges attract. Recall examples of real life occurrences of static electricity including lightning.
Instructional Procedures:

Explain to the students that they will be:

- conducting experiments to further investigate what types of objects can be statically charged.
- using wool and fur or their hair to create charges.
- comparing charges and recording their findings.

Pass out Kit #1 to each group.
Give each student a "Static Charges " data sheet on which to record their findings. Students may work together and share findings. The top half of the worksheet is for students to compare and record the amount of static charge produced by rubbing the items in the kit with the wool, animal fur or their hair. They will record their discoveries on the sheet by counting how many tissue paper pieces were attracted to each item.
After allowing students enough time to complete their tasks, have them put away their kits.
Discuss their findings as a class. Discussion may include which items were able to hold the greatest and weakest charges; which materials created the greatest and weakest charges; and possible reasons. See background for reasons for reactions.
After the discussion, you may wish to end the lesson for the day and begin again during the next science session.

Next Lesson:

Pass out Kits #1and #2.During this lesson students will use the friction rod and wool cloth to test the effect of a charge on the items in Kit #2.
The students will record their findings on the data sheet used in the previous lesson. They will charge the friction rod with the wool and investigate how the various items will react to it.
Students will record their findings on the data sheet in the appropriate boxes by counting how many items were attracted to the charged rod. Some are hard to count (eraser crumbs, saw dust), so students should indicate whether many or few pieces of eraser and sawdust were attracted to each charged item.
Discuss the findings with the class. Include which items were attracted to the charged items and which items were easiest to charge. Draw conclusions from the results.
Assign homework. Using their balloons from the introductory lesson on static electricity, students will discover what can be attracted to a static charge in their homes. The next day they will report their findings to their groups and then a group spokesperson will report two or three of the most unusual items to the class. Reiterate which types of materials and items best hold a charge and why.

Extensions

Students could try using other materials to test their reactions to static electricity such as laminating film scraps, plastic shavings from PVC pipe, and different weights and types of paper.
How do you know that your hair or your clothes are statically charged? Share at least two ways.
Graph the data about how many tissue paper squares are picked up.

Assessment Plan

Prepare a list of what will and won't hold a charge or list items previously tested and other similar items in your journal. Students will identify which items will and won't hold a charge.

Bibliography

This lesson is part of the Fifth Grade Science Teacher Resource Book . The TRB3 is designed to be your textbook in teaching science curriculum to your students. This book covers all the objectives of each standard and benchmark. If taught efficiently, a student should do well on the End-of-Level (CRT) tests. The TRB3 is designed for teachers who know very little about science, as well as for teachers who have a broad understanding of science.

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