Natural vs. Synthetic

Summary

Students will test a variety of fabrics, some natural fibers and some man-made. They will summarize reasons why different fabrics may be used for different purposes and how chemical technology has affected human life.

Time Frame

2 class periods of 45 minutes each

Group Size

Small Groups

Materials

8 fabrics cut into 1 cm squares(naturals: wool, cotton, silk (silkworms), linen(flax), synthetics: fleece, nylon, acetate, dacron, polyester)
alcohol burners or candles
probe or tweezers
bleach(you may want to dilute by 50% for safety)
1 test tube per group
dropper bottle with water
1 beaker per group

- student worksheet

Background for Teachers

The flame test is one that is done on all fabrics. Students may have seen infant sleepwear labeled "fire retardant". Synthetic fabrics can cause severe burns in a fire because they melt to the skin. It is important to buy fabrics that are about the same thickness. A lightweight silk or nylon will burn rapidly just because they are so thin. The water absorbency test models the way the fabric would absorb sweat. Rayon is made from cellulose and is a natural fiber that has been altered in the manufacturing process.

Instructional Procedures

Ask students what their shirts are made of. Some may know but most will have to have a partner look at the label under their collar. Have several students tell you what they are wearing. Ask them what they know about the fabrics. Discuss the two categories, natural fibers and synthetics. You may wish to discuss how fabrics are made from any fibers that can be woven into cloth and that chemists discovered how to make fibers from petroleum products that we now weave into synthetic fabrics.
Read the introduction of the student sheet with students and describe where the materials are and where the test tube will be stored overnight. Discuss safety with the flame they will be using. Give students time to work on the water and flame tests. The bleach test tubes can be labeled and placed on a rack until the next day.
The second day have each group report what happened in the bleach tube to their fabric. They should all fill in their data tables.
Have students answer the analysis questions and write conclusions.

Assessment Plan

Scoring Guide

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1. Students perform tests on fabrics and fill in data table……4
2. Students answer analysis questions correctly……..4
3. Students write thoughtful conclusion……..4

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

Utah LessonPlans