TRB 5:1 -- Act. 8: Physical Changes & Chem. Reactions

Summary

At the conclusion of this activity students will be able to describe and compare physical changes.

Materials

Copy of "Physical Changes and Chemical Reactions Journal Page" for each student.

Background for Teachers

Physical changes and chemical reactions are taking place all around us and all the time. This activity will challenge students to identify some of those physical changes and chemical reactions and share what they discover with the class. Conduct this activity at the end of the this unit when your students have a good understanding of physical changes and chemical reactions. You can use this activity as an assessment of students' understanding of physical changes and chemical reactions.

Intended Learning Outcomes

1-Use science process and thinking skills.
2-Manifest scientific attitudes and interests.
3-Understand science concepts and principles.
4-Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn:

For this demonstration you will need one sheet of ordinary notebook paper and a pair of scissors.

Begin by showing the class the notebook paper and telling them you are going to cut a hole in the paper large enough for you to walk through.

Fold the paper in half and make a series of straight cuts from the folded side about 2 cm 8.2.47 apart. Stop about 1 cm from the opposite edge of the paper.

Now make cuts starting from the other side of the paper and ending about 1 cm from the opposite edge of the paper.

Next cut off all the folded ends except for the first and last strip at each end of the paper.

Carefully open the paper and walk through the hole.

Ask the class to describe the physical properties of the paper before and after the hole was cut in it. Was the paper changed chemically or physically? (Physically. Only the physical properties of the paper were changed; no new substances were formed by cutting the paper.)

Adapted from: Invitations to Science Inquiry by Tik L. Liem

Instructional Procedures:

Challenge the class to name as many types of physical changes as they can, and list their responses on the board. The list may include the following: cutting, sawing, sanding, breaking, denting, squeezing, stretching, snapping, soiling, dying, heating, cooling, expanding, contracting, melting, freezing, boiling, evaporating, condensing, mixing dissolving, soaking, drying, etc.

Next challenge the class to name the indicators of a chemical reaction, and list their responses on the board. The list should include: production of a gas, change of temperature, formation of a new substance, production of a solid, production of light, and change of color. Also have students list examples of chemical changes such as: burning paper, a rusting can, baking cookies, boiling an egg, mixing vinegar and baking soda, etc.

As homework, assign students to prepare a short, (about 1 minute) demonstration of a physical

change or chemical reaction, to present to the class. Encourage students to be imaginative and look for a demonstration that is different from what they have already done in class.
Students should get permission and help from an adult as they work to prepare their demonstrations. You may wish to prepare a note for parents to inform them of the assignment.
Caution students to use common items that can be easily transported and stored. Further caution students to make sure their demonstrations are safe. Do they need to wear safety goggles or gloves? Is there a danger of getting cut or harmed in other ways? What precautions will they take to ensure everyone 's safety?
Have students present their demonstrations to the class. During each demonstration, class members should record their observations and responses on the "Physical Changes and Chemical Reactions Journal " page. (More than one journal page may be needed to record all observations.)

Extensions

To help students further understand phase changes, set out a piece of dry ice and have students observe it. Since dry ice (frozen carbon dioxide) sublimates, goes from a solid to a gas, at room temperature students will be able to watch it disappear. Have them describe the properties of the dry ice before and after it sublimates. How have the physical properties changed? (Solid to a gas). Have any new substances been created? (No, just a phase change) How could the carbon dioxide be changed back into a solid again? (Getting it cold enough)

Assessment Plan

Use this rubric to assess your students ' performances:

Compare and Describe Physical Changes

Student 's Name_____

	4	3	2	1
Journal Page	Clelar, accurate, descriptions. All observations completed.	Descriptions mostly clear and accurate. All observations completed.	Descriptions somewhat clear and accurate. All obervations incomplete.	Descriptions unclear and inaccurate. All observations incomplete.
Presentation	Demonstration well-prepared, and within time limit. Presenter show confidence.	Demonstration fairly well-prepared, and within time limit. Presenter a little unsure of self.	Demonstration prepared but not within time limit, presenter unsure of self.	Demonstration shows no evidence of preparation.

Bibliography

This lesson is part of the Fifth Grade Science Teacher Resource Book (TRB3) http://www.usoe.org/curr/science/core/5th/TRB5/. 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.

Authors

Utah LessonPlans