Fernbank Science Center

Title: CHEMISTRY ON THE ROAD (4539/4011)
Level: 5th Year
Location: Local School
Type: Outreach
Length: 60 minutes
Limit: 150 students

Program Description

This program is designed to introduce students to chemistry through the use of chemical demonstrations. The ideas of chemical reactions are introduced through the production of gases, the change in temperatures, making new products, and colorful chemical reactions, including the formation of polyurethane.

Standards

The students will be able to:

1) GPS S5P2 (a) investigate physical changes by separating mixtures and manipulating paper to demonstrate examples of physical change;
2) GPS S5P2 (c) investigate the properties of a substance before, during, and after a chemical reaction to find evidence of change;
3) develop a positive attitude towards chemistry and related subjects;
4) appreciate the fact that chemical reactions are the basis for many "natural phenomena;"
5) **S5CS1 (b) carefully distinguish observations from ideas and speculation about those observations**;
6) **S5CS1 (c) offer reasons for findings and consider reasons suggested by others**.

Vocabulary

matter	chemical change	physical change
solid	gas	liquid
properties	energy	precipitate
solution	molecules	atoms

Pre-Visit Activities

Review the vocabulary.

Post-Visit Activities

4539 Chemistry on the Road Post-Activity addresses the following GPS S5CS1 (b), S5CS4 (b), and (c)

Resource: McGraw-Hill. Science, Level 5, Unit E: Chapter 11, E68-77

4539 Post Visit Activity

Properties of Chemicals

Properties are characteristics that you can use to describe or identify different substance. (How things look, feel, taste etc.)

1. State – solid, liquid or gas
2. Color – color or colorless
3. Texture – if solid, smooth or rough
4. Luster - if it is a solid, shiny or dull
5. Crystal structure – Does the solid form crystals? What shape of crystals?
6. Odor – How the substance smells. Use proper smelling procedure!
7. Solubility – How much dissolves in water? How much dissolves in other solvents?
8. Freezing or melting point – At what temperature does the liquid turn into a solid or the solid into a liquid?
9. Boiling point – At what temperature does the liquid bubble and turn very rapidly into a gas?
10. Density – Mass of a specific volume of a substance
11. Behavior – Does it burn? Does it rot? Does it explode? Does it act as a poison? How does it change when it is heated? If it is mixed with another substance, does the other substance change?

Using the following list of substances, write down all of the properties you can for each one. Remember to include behavior and all of the visible properties.

1. paper
2. flour
3. sugar
4. wood
5. orange juice
6. window cleaner
7. apple juice
8. coke
9. iron

Substance	State	Color	Texture	Luster	Crystal Structure	Odor	Solubility	Melting point	Boiling Point	Density
1. Paper										
2. Flour										
3. Sugar										
4. Wood										
5. Orange Juice										
6. Window cleaner										
7. Apple Juice										
8. Coke										
9. Iron										

Graphing activity

Listed below are the boiling points of different elements.
Plot the boiling points on the graph.
Make sure to label your graph with the proper units!

Element	***Boiling Point °C*** ***(Temperature at which this element evaporates into a gas)***
Carbon	4827
Lead	327
Calcium	839
Nitrogen	-210
Gold	1064
Copper	1083
Helium	-269
Oxygen	-218
Potassium	64
Hydrogen	-253