



Chemist: Tempest in a Teacup

Time: 45 Minutes

Skill Level: Elementary (age 6-11)

Background

What is Science Inquiry?

Children are natural scientists. From a very early age they explore the world, ask questions and seek answers. This journey of exploration and discovery is Science Inquiry. Science Inquiry helps young people understand their environment, solve problems and gain knowledge about scientific ideas and processes.

Next Generation Science Standards (NGSS)

Science and Engineering Practices

1. Asking questions
3. Planning and carrying out investigations

Disciplinary Core Ideas

PS1: Matter and its interactions

Crosscutting Concepts

2. Cause and effect: Mechanism and explanation

Objective

In this activity, students will observe several different chemical reactions.

About the Scientist

Chemists are scientists that study the composition and properties of matter, and the way chemicals interact with each other. Some chemists study substances at the atomic and molecular levels. They often work in laboratories and use their knowledge to identify unknown substances, as well as develop new products or improve existing products.

The Science of Chemical Reactions

A chemical reaction occurs when a chemical substance changes into another substance with a different chemical identity. The key to identifying a chemical reaction is to make observations! A chemical reaction is usually accompanied by easily observed physical effects, such as the emission of heat and light, or a color change. However, a true chemical reaction can only be verified by chemical analysis.

Materials List:

Baking powder
Baker's yeast
Hydrogen peroxide
Vinegar
Clear plastic cups
Plastic spoons
Paper towels

Discuss ...What do students know about chemical reactions? Have they seen a chemical reaction? How does a chemist predict when a chemical reaction will occur or what will result? What do you think will happen if we mix these ingredients together?

Predict ...Generate Ideas. Select a Solution.

Experience "What to Do"- What is the plan for the investigation?

Give each group of students four cups. Encourage them to design their own experiments testing different combinations of a powder (baking powder or yeast) and a liquid (hydrogen peroxide or vinegar). Have students make predictions before starting the experiment and record observations during the experiment.

Share ...Encourage students to discuss their observations as they combine the chemicals.

Reflect ...Analyze and interpret the data and results. Discuss among the group.

Which combinations resulted in chemical reactions? How do we know?

Generalize ...to real world examples. Construct explanations.

Why do some chemicals react with each other whereas others do not?

Apply ...outside the classroom or club meeting.

What are some examples where these chemical reactions are utilized?

Additional resources:

- This experiment is based on an activity by Fetch! With Ruff Ruffman for PBS Kids:
<http://pbskids.org/fetch//parentsteachers/activities/act/act-tempest.html>

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Agriculture Sciences & Natural Resources, Family & Community Health, 4-H Youth, Forestry & Natural Resources, and Extension Sea Grant programs. Oregon State University Extension Service offers its programs and materials equally to all people.