

NTTI Media-Rich Lesson

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NAME

In the Mix

TITLE

Fifth Grade

GRADE LEVELS

Three 45-Minute Class Period

TIME ALLOTMENT

Two 45-minute class periods

OVERVIEW

Students have had experiences with mixtures of one kind or another, whether they know it or not. Ever since preschool, children have been sorting buttons, coins, and the different colors of M&M's. Two or more substances that differ in properties that are put together are considered a mixture.

Heterogeneous mixtures can be separated by sorting, screening, or filtering. Homogeneous mixtures, however, often require evaporation or a chemical reaction as a means of separating. Students will view a video, found at <http://peachstarunitedstreamin.com>, that provides examples and definitions of heterogeneous and homogeneous mixtures. They will list several examples of each and compare/contrast mixtures. Finally, students will experiment with separating both heterogeneous and homogeneous mixtures.

SUBJECT MATTER

Physical Science

LEARNING OBJECTIVES

Students will be able to:

- Define, compare, and contrast mixtures
- Measure solids and liquids

- Separate mixtures using screens, filters, and evaporation
 - Name and create various mixtures
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STANDARDS

Georgia Quality Core Curriculum (QCC's)
www.glc.k12.ga.us

Strand: Inquiry

1-Topic: Science Inquiry, Process Skills, and Problem Solving

Standard: Asks questions, makes and keeps records of observations, classifies objects and events, communicates with others, makes inferences and predictions, uses estimation and measurement, uses evidence to construct explanations, makes sketches and diagrams to explain ideas, organizes data into tables and charts for interpretation, reads and interprets various types of graphs, formulates simple hypotheses, identifies and controls a limited number of variables, and designs a simple experiment.

3-Topic: Safety

Standard: Identifies and practices accepted safety procedures in manipulating science materials and equipment.

4-Topic: Activities/Tools

Standard: Actively engages in the learning process via hands-on/minds-on science activities and experiences. Uses appropriate tools to collect and analyze data and solve problems.

Strand: Physical Science

6- Topic: Structure of Matter

Standard: Investigates characteristics of length, mass, volume, density, alkalinity/acidity, and temperature. Uses balance scales, thermometers, rulers, litmus paper, and containers to compare characteristics of various objects.

8-Topic: Structure of Matter

Standard: Differentiates between and describes physical and chemical changes in matter. Identifies and demonstrates examples of physical and chemical changes.

MEDIA COMPONENTS

Web Sites

Peachstar

http://peachstar.unitedstreaming.com/login_peachstar.cfm

Videos can be downloaded at no cost in all areas of science. Specify the grade level and subject.

LHS FOSS K-8 Program

www.lhs.berkeley.edu/FOSS

FOSS K-8 has 36 curriculum units for grades K-8 under 4 strands: Life Science, Physical Science, Earth Science, and Scientific Reasoning and Technology.

PREP FOR TEACHERS

Prior to teaching this lesson, purchase materials from you local grocery store and obtain a computer, projector, and screen. (Note: You may require speakers as well according to the volume of your projector). Bookmark the websites used in the lesson on each computer in your classroom. (Note: Obtain permission from parent/guardian before lesson for students who have restricted diets).

MATERIALS

Per group:

- 1 cup of marbles
- _ cup of beads (less than 1mm in diameter)
- 2 Tbsp. sugar
- 1 cup of water
- 2 hand lenses
- 1 screen
- 1 coffee filters
- 10 paper cups for mixing
- student recording sheets
- pencils

white paper
computer

Internet Video: *Physical Science: Mixtures and Solutions*
http://peachstar.unitedstreaming.com/login_peachstar.cfm

INTRODUCTORY ACTIVITY

Step 1

Distribute cups of mystery/trail mix to students. Ask students how many pretzels, raisins, and chocolate chips they each have. Students will manually separate the mixtures to determine how much of each material they have. Teacher will ask students for responses and probe further with questions such as: “Was this mixture easy to separate?”, “What if we added yogurt to the mix- would it be as easy to separate?”, “What about adding water?”, “Would it still be considered a mixture if we mixed marbles, paperclips, and staples?”, “What if we mixed water, soda, and milk- could they be separated in the same way?”

LEARNING ACTIVITY

Provide students with a **FOCUS FOR MEDIA INTERACTION**, explaining that they will now see examples of different kinds of mixtures. **TURN OFF THE SOUND** and show the mixtures video from 2:57 when you see the word “Mixtures” on the screen through 5:25. **STOP** when you see the perfume sprayed. **CHECK** for understanding by asking students to name the mixtures that they saw. Discuss the differences between the mixtures they saw. **REWIND** back to 2:57 and this time show the video with the sound on. **STOP** at 5:25. Make a Venn-diagram listing the differences between homogeneous and heterogeneous mixtures as a whole group.

CULMINATING ACTIVITY

Step 1

Distribute the materials to each group and ask them to make as many mixtures as they can (at least 5) that are heterogeneous and homogeneous. Possible combinations include: sugar, marbles, and beads; sugar, water and beads; beads and water only; sugar and water only; and so on. Students should record each combination and state whether they are heterogeneous or homogeneous.

Step 2

Now ask students to use the screen, filter, or their hands to separate the mixtures. Which were easier/harder to separate? How can they be sure the sugar separated from the water? Discuss evaporation and how that may be the only way to separate some homogeneous mixtures. Ask students to leave coffee filters by the window to dry so they can observe if the sugar did indeed separate from the water.

Step 3

Tell students that they will wrap up with the short quiz at the end of the video. **PLAY** when you see the End of the Video Quiz at 14:50. Go through the first 2 questions and **STOP** when you see the shaving cream.

CROSS-CURRICULAR EXTENSIONS

MATHEMATICS

Make a bar graph of what students choose as their favorite ingredients from the introductory mixture: pretzels, raisins, or chocolate chips.

HEALTH

Have students examine the content label on several pre-packaged mixtures, like cereal or trail mix. Determine which ones have the best nutritional value.

LANGUAGE ARTS

Ask students to create a healthy trail mix and write an advertisement or commercial to promote it.

SCIENCE EXTENSION

Students should test ingredients to see if they can make mixtures with water: flour, alum, baking soda, cooking oil, and Epsom salts.

COMMUNITY CONNECTIONS

Visit a neighborhood restaurant and discover the various mixtures and solutions on the menu.

Invite a chemist to your classroom to demonstrate and discuss separating mixtures and solutions.