

Solutions and Mechanical Mixtures	Grade 7 Matter and Energy
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<h2 style="margin: 0;">Lesson Plan</h2>	Assessment	Assessment for learning
	Cross-curricular	Math

<p>Big Ideas</p> <ul style="list-style-type: none"> Matter can be classified according to its physical characteristics The particle theory of matter helps to explain the physical characteristics of matter <p>Overall Expectations</p> <ol style="list-style-type: none"> 2. Investigate the properties and applications of pure substances and mixtures 3. Demonstrate an understanding of the properties of pure substances and mixtures; and describe these characteristics using particle theory 	<p>Specific Expectations</p> <ul style="list-style-type: none"> 2.4 Use scientific inquiry/experimentation skills to investigate the properties of mixtures and solutions 3.4 Distinguish between solutions and mechanical mixtures <p>Learning Goal</p> <ul style="list-style-type: none"> To be able to identify the physical properties that distinguish the difference between a solution and a mechanical
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Description

In this lesson, students experiment with different substances to see how they interact with each other. They will use a table to create a hypothesis for each mixture and then conduct the experiment and compare their results. Students can create their own experiment to extend their learning.

<p>Materials</p> <ul style="list-style-type: none"> 18 plastic cups Water Vegetable oil Rubbing alcohol Salt Sugar Flour Marker 	<p>Safety Notes</p> <p>Do not consume any of the substances or mixtures that are part of the experiment.</p>
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Introduction

Discuss the difference between a solution and a mechanical mixture with students:

There are two types of mixtures, a mechanical mixture or a solution. When different kinds of matter are visible in the mixture it is called a mechanical mixture (or heterogeneous mixture). In a mechanical mixture, the particles are unevenly distributed in groups. Examples of mechanical mixtures include a toy box, cereal and milk or a pizza.

When different kinds of matter mix together so that they are not visible in each other, or that it looks like a pure substance, it is called a solution (homogeneous mixture). The particles in a solution are evenly mixed together. Examples of a solution include apple juice, stainless steel or air.

Action

Follow the procedure to complete the experiment:

1. Fill a plastic cup with each of the three liquids and label them:
 - Water
 - Vegetable Oil
 - Rubbing Alcohol
2. Fill a plastic cup with each of the three solids and label them:
 - Salt
 - Sugar
 - Flour
3. Complete the hypothesis section of **Table 2** in the handout, predicting whether each mixture will be a solution or a mechanical mixture.
Example: In cup one, predict how water and vegetable oil will mix.
4. Label the remaining plastic cups according to **Table 1** in the handout and mix the listed substances in each cup. Mix equal parts of each substance. Record if each mixture is a solution or a mechanical mixture in **Table 2** of the handout.
5. Direct students to complete the questions included as part of the handout, these can be used as a form of assessment.

Extensions

Repeat the experiment but allow students to choose three liquids and three solids of their choice. Students can create hypotheses and test their own experiment or try the experiment designed by a peer.

Resources

The table and questions to be completed by students are included as a handout.
