

## Science Lesson Plan

<b>Title:</b>	Introduction to Mixtures
<b>Topic/Strand:</b>	Mixtures and Solutions
<b>Grade Level:</b>	5 <sup>th</sup> Grade
<b>Teacher:</b>	Adelyn Lyon
<b>Curriculum:</b>	FOSS Mixtures and Solutions
<b>Estimated Time:</b>	90 minutes

### 1. Overview

Using science tools to effectively make observations about the physical properties of substances is an important standard that 5<sup>th</sup> grade students need to develop in order to access more challenging science laboratory work in later grades. Access to science standards is not always effectively provided, as many science lessons do not adequately address the language needs of a science activity. This lesson helps 5<sup>th</sup> graders explore three specific substances – gravel, sodium chloride, and diatomaceous earth – and how the physical properties of the substances can change when a mixture is made of the substance and water. Students will work in small lab groups and will be given structured language supports when discussing, observing and recording observations of substances and mixtures.

Students begin by observing and writing about the physical properties of the substances. Then, they mix the substances with water to form a mixture, and predict which kinds of filters will successfully separate the mixtures. Finally, the students will test their predictions and reflect on the results.

### 2. Learning Goals and Standards

#### Goals:

Science Learning Goals:

1. Students will come to know and understand that various materials (substances) may have different physical properties (S1)
2. Students will come to know and understand that mixtures are an intermingling of two or more materials, and that some mixtures can be separated using filters. (S2)

Language Learning Goals:

1. Students will be able to communicate effectively with classmates and the teacher about the physical properties of substances and the study of mixtures (ELD1)
2. Students will be able to use concepts and academic vocabulary to complete writing activities that support concept development related to the study of mixtures (ELD2)
3. Students will be able to follow multi-step directions given verbally and in written form (ELD3)

#### Standards:

- English Language Arts Standards (5<sup>th</sup> Grade)
  - READING.
    - Vocabulary & Concept Development 1.4: know abstract, derived roots and affixes from Greek and Latin and use this knowledge to analyze the meaning of complex words.
  - LISTENING AND SPEAKING.
    - Comprehension 1.1: Ask questions that seek information not already discussed.
    - Organization & Oral Communication 1.5: Clarify and support spoken ideas with evidence and examples.
- English Language Development (ELD) standards, 3<sup>rd</sup> -5<sup>th</sup> Grade.
  - WRITING.
    - Organization & Focus (Early Advanced): Use more complex vocabulary and

sentences appropriate for language arts and other content areas (e.g., math, science, history–social science).

- Language Conventions (Early Advanced): Produce independent writing with consistent use of correct capitalization, punctuation, and spelling.
- READING.
  - Word Analysis (Advanced): Apply knowledge of word relationships, such as roots and affixes, to derive meaning from literature and texts in content areas.
  - Comprehension (Intermediate): Understand and follow some multiple-step directions for classroom-related activities.
- LISTENING AND SPEAKING.
  - Comprehension, Organization, & Delivery of Oral Communication (Early Advanced): Make oneself understood when speaking by using consistent standard English grammatical forms, sounds, intonation, pitch, and modulation but may make random errors.
  - Comprehension, Organization, & Delivery of Oral Communication (Early Advanced):: Recognize appropriate ways of speaking that vary according to the purpose, audience, and subject matter.
  - Comprehension, Organization, & Delivery of Oral Communication (Early Advanced): Ask and answer instructional questions with more extensive supporting elements.

### 3. Assessments

- Student Artifacts: mixtures worksheets and science notebooks (meets learning goals: S1, S2, ELD 1, ELD 2, and ELD 3)
- Teacher artifact: formative assessment note sheet – used to assess target students who are English learners and/or have learning/language disabilities. (meets learning goals: S1, S2, ELD 1, ELD 2, and ELD 3)

### 4. Resources and Preparation

#### *Materials From FOSS kit (for each group)*

6 plastic cups  
6 self stick notes  
3 craft sticks  
2 hand lenses  
1 screen  
1 FOSS funnel  
2 filter papers  
1 container, ½ liter  
1 syringe – 50mL  
1 basin  
From FOSS kit (for class)  
2 containers of gravel  
2 containers of diatomaceous earth (“powder”)  
2 containers of kosher salt  
5 spoons, 5-mL  
2 pitchers  
6 popsicle sticks, 2 each labeled G, D, and S

#### *Provided by teacher*

Water  
Paper towels  
Chart Paper (for lab rules)  
Bucket (optional)  
Rulers (2 per group)  
Handouts  
Investigation 1 Overview  
Properties of Matter worksheet  
Separating Mixtures worksheet  
Lab directions (one per group)  
Visuals  
Chemical lab rule poster (teacher made)  
Use of document camera (or other source) to display all worksheets



<p><b>2. Investigate &amp; Discuss Data (~50 minutes)</b></p> <p><i>Part 1. Observing the physical properties of three materials</i></p> <p>Introduce three materials that will be observed: gravel [collection of small, rounded stones or pebbles], diatomaceous earth [a very fine powder made from the fossils of diatoms, a small hard-shelled single-cell organism; connect to greek root diatom [single celled organism] and latin suffix -aceous [like, similar to, full of]]; and sodium chloride [common table salt]</p> <p>Students make observations and collect data, using recording sheet</p> <p>Circulate around the room, engage in instructional conversations, collect formative assessment data</p> <p>Whole class: Review data from part 1 - observing the physical properties of three materials. <i>What properties did you observe for gravel? for the diatomaceous earth? for the sodium chloride?</i></p> <p>[Listen for claims or inferences that students make that rely on information other direct observation]</p> <p><i>Part 2. Observing the physical properties of three materials when water is added</i></p> <p>Notebook set up for predictions and observations</p> <p>Whole class: Elicit predictions from students:</p> <p><i>What do you think will happen when you add water to the gravel? to the diatomaceous earth? to the sodium chloride?</i></p> <p>Students make observations and collect data</p> <p>Circulate around the room, engage in instructional conversations, collect formative assessment data</p> <p>Whole class: Review data from part 2 - observing the physical properties of three materials. <i>What happened? What changed? What remained the same? What happened to the salt?</i></p> <p>[CX] <i>What happens when you add water to a drink mix like hot cocoa?</i></p> <p><i>Part 3. Separating mixtures with filters</i></p> <ul style="list-style-type: none"> <li>• What is a <u>filter</u>? [noun: something you use to separate mixtures] [Use Visual Aid] [Bring in screens, coffee filter, colander] Can you give some more examples of filters? [tea bags, aquarium filter, air filter]</li> <li>• [CX] Have you ever used a filter outside of school, or seen a filter being used?</li> </ul> <p>Whole class prediction: <i>What do you think will happen when you use a screen to filter the gravel and water mixture? the powder and water mixture? the salt and water mixture?</i></p> <p>Students make observations and collect data</p> <p>Circulate around the room, engage in instructional conversations, collect formative assessment data</p> <p>Repeat predictions, observations and data collection using the paper filter</p> <p>Whole class: Review data from part 3 - separating mixtures with filters</p> <p><i>What happened when you tried to filter the gravel and water mixture? the powder and water mixture? the salt and water mixture?</i></p> <p>Discuss what happened with the salt mixture</p>	<p>Lit</p> <p>IC</p> <p>IC</p> <p>IC</p> <p>Lit</p> <p>IC</p> <p>CX</p> <p>IC</p> <p>Lit</p> <p>IC</p> <p>VOCAB</p>	<p>gravel</p> <p>diatomaceous earth</p> <p>sodium chloride salt</p> <p>filter (noun and verb)</p>
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<p><b>3. Sense making and lesson closure (~15 minutes)</b>  Ask students to talk to their partner about what they learned today. (I learned that ...)  Whole class discussion:</p> <ul style="list-style-type: none"> <li>• What is a mixture?</li> <li>• How do you separate mixtures?</li> </ul> <p>Ask students to write in their science notebooks a few sentence about what they learned today (I learned that ...)</p> <p>Review key science ideas:</p> <ul style="list-style-type: none"> <li>+ all matter has physical properties that can be observed or measured</li> <li>+ a mixture is something combining two or more materials with different properties</li> <li>+ You can separate some mixtures using a filter</li> </ul> <p>Preview the next science lesson by posing questions: why couldn't we filter the sodium chloride mixture? What do you think we call mixtures that can't be filtered?</p>	<p>IC Vocab</p> <p>Lit</p> <p>Vocab</p>	<p>mixture separate filter</p>
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**6. Related Resources**

Full Option Science System (FOSS), California Edition, Mixtures and Solutions Unit for 5<sup>th</sup> Grade  
<http://www.fossweb.com/teacher-home>