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Cauldron Bubbles

Quebec - Achievements and Competencies

Learning Outcomes

Cycle 1 (Gr. 1-2)	Cycle 2 (Gr. 3-4)	Cycle 3 (Gr. 5-6)
Mixtures	Properties of matter	Properties of matter

The Quebec Achievements and Competencies are based on the Progression of Learning Outcomes derived from the Quebec Education Plan set by the Ministere de l'Education, du Loisir et du Sport.

Specific Expectations

CYCLE 1 (Gr. 1-2)

MATERIAL WORLD

A. Matter
   2. Mixtures
      b. Distinguishes between mixtures of miscible and immiscible liquids (e.g. water and milk, water and oil)

Students will see that water and oil do not mix, therefore they are immiscible liquids.

      c. Distinguishes between substances that are soluble in water (e.g. salt, sugar) and those that are not (e.g. pepper, sand)

Students will observe that oil does not dissolve in water, thus forming two layers. They will see that the salt interacts differently with the water than with the oil because the salt dissolves in the water, allowing for the oil droplet to return back to its original layer above the water.

F. Appropriate Language
   1. Terminology related to an understanding of the material world

Students should use the appropriate terminology throughout the activity (e.g. miscible, immiscible, float, sink, dissolve).

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CYCLE 2 (Gr. 3-4)
MATERIAL WORLD

A. Matter
1. Properties and characteristics of matter
h. Associates the buoyancy of a volume of liquid in an identical volume of a different liquid with the densities of these liquids (relative density)

Students should compare the properties of oil and water. When the two liquids are mixed, students will observe how the oil floats on top of the water due to the different densities of each liquid. They will learn how the salt increases the density of the oil, causing oil droplets to sink. Once the salt dissolves in the water, the oil droplet rises back up to the oil layer, maintaining its original density.

F. Appropriate Language
1. Terminology related to an understanding of the material world

Students should use the appropriate terminology throughout the activity (e.g. miscible, immiscible, density, float, sink, dissolve).

CYCLE 3 (Gr. 5-6)

MATERIAL WORLD

A. Matter
1. Properties and characteristics of matter
i. Explains the buoyancy of a substance in another substance, using their respective densities (relative density)

Students should discuss how the density of oil is less than the density of water, therefore the buoyant force of the water on the oil is greater, causing the oil to rise, or float, on top of the water. When the salt is added, the weight of the oil exceeds the buoyant force exerted on the oil from the water, causing it to go to the bottom of the container, sinking in water. Once the salt dissolves in the water, the oil rises back on top of the water because its density goes back to its original state.

j. Describes various other physical properties of an object, a substance or a material

Students will investigate the changes that occur when the salt and oil interact and the salt and water interact. They will describe how the salt interacts differently with the oil than the water.

F. Appropriate Language
1. Terminology related to an understanding of the material world

Students should use the appropriate terminology throughout the activity (e.g. miscible, immiscible, density, float, sink, dissolve, buoyancy, solubility).

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Strategies

EXPLORATION STRATEGIES

- Recalling similar problems that have already been solved
- Formulating questions
- Putting forward hypotheses (e.g. individually, as a team, as a class)
- Using different types of reasoning (e.g. induction, deduction, inference, comparison, classification)

STRATEGIES FOR RECORDING, USING AND INTERPRETING INFORMATION

- Using a variety of observational techniques and tools

COMMUNICATION STRATEGIES

- Comparing different possible explanations for or solutions to a problem in order to asses them (e.g. full-group discussion)