

Achievements and Competencies

Learning Outcomes

Grades 4-6
Properties and changes of materials

Achievements and Competencies are based on the Common Framework of Science Learning Outcomes (K-12) set by the Canadian Council of Ministers of Education (1997).

Specific Expectations

Grade 5

PHYSICAL SCIENCE

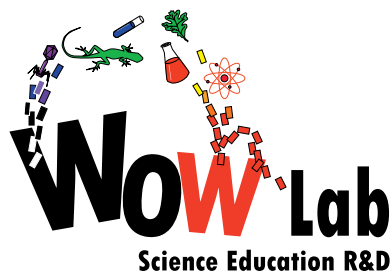
Properties and changes of materials

104-2 Demonstrate and describe processes for investigating scientific questions and solving technological problems (e.g., demonstrate techniques, such as tearing, breaking and pounding, to investigate physical properties. Prepare putty and demonstrate how it can be used to repair a window).

The students will start with a jar filled with cream and finish with butter and buttermilk. The students will describe and investigate how the physical properties of cream can be changed by shaking the jar of cream for approximately 20-25 minutes.

204-2 Rephrase questions in a testable form (e.g., rephrase a question such as "Does changing the physical characteristics of an object change its mass?" to "What happens to the total mass of a piece of cardboard when it is cut up into several pieces?").

Students can ask questions in a testable form such as "What happens to the total mass of the original cream when it is shaken in a glass jar for a specific period of time?"



a WOW Lab

BLUEPRINT

Milk Medley - Achievements and Competencies

205-3 Follow a given set of procedures (e.g., follow a given set of procedures to determine whether changes caused by wetting materials are reversible or irreversible).

The students will work in groups to create cheese from a jar filled with cream. Once they observe the initial physical change of the cream to butter and buttermilk, they will warm up the butter and buttermilk mixture to reverse the mixture back to the initial state of cream. Similarly, when creating glue from milk, students will follow the procedures for draining then cutting the curds, and adding the hot water and baking soda to the mixture. The students will then determine that making glue from milk is a chemical change, and is irreversible.

205-5 Make observations and collect information that is relevant to a given question or problem (e.g., make observations related to the characteristics and properties of materials and objects as they are cut up, crushed and stretched).

Students will observe the characteristics and properties of the milk before and after it is transformed into butter, glue and cheese.

300-9 Group materials as solids, liquids or gases, based on their properties.

Students will observe that the milk is a liquid, the cheese and butter are solids, and the glue begins as a liquid but then transforms into a solid form. In addition, they will determine the properties that define each of the categories.

300-12 Identify the source of the materials found in an object and describe the changes to the natural materials required to make the object.

Students will identify the source of the materials in the butter, glue and cheese (milk), and describe the changes that take place when transforming the milk into a new product.

301-10 Identify and describe some changes to materials that are reversible and some that are not.

Students will clearly identify that the transformation of milk into glue and cheese is a irreversible chemical change, whereas the transformation of milk into butter is a reversible physical change.