

Achievements and Competencies

Learning Outcomes

Kindergarten - Grades 3	Grades 4-6
Properties of objects and materials	Properties and changes of materials
Materials and our senses	
Liquids and solids	
Plant growth and changes	

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 1

PHYSICAL SCIENCE

Properties of objects and materials

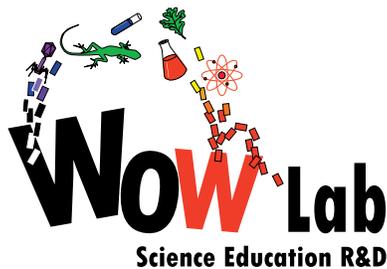
100-12 Observe objects and materials and describe their similarities and differences (e.g., compare the properties of objects they and others have constructed. Investigate a variety of materials and describe the different forms they can take).

Students will make their own paper using various materials. The differences and similarities between the various cellulose-containing substances such as celery, mangoes and banana peels can be investigated and described.

101-5 Explore and describe ways to create useful objects by combining or joining different components or materials (e.g., identify objects and materials that are useful for constructing things; observe that different materials have different characteristics and select materials according to a given need).

Recycled Paper allows the students to combine different materials (fruits, vegetables or used paper) to create a new useful object. Once the students have completed the activity, they will have created functional recycled paper which they can use for arts and crafts.

103-3 Describe and demonstrate ways to use materials appropriately and efficiently to the benefit of themselves and others (e.g., select the amount and kind of materials that are appropriate to a given task).



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Recognize and demonstrate appropriate reuse of materials in daily activities).

Extracting the cellulose fibers from fruits, vegetables and used paper to create new paper allows students to recognize and demonstrate appropriate use of materials in daily activities.

PHYSICAL SCIENCE

Materials and our senses

100-10 Identify attributes of materials that we can learn to recognize through each of our senses (e.g., compare sounds using words such as “loud” or “soft,” “high pitch” or “low pitch”. Describe tastes as sweet, sour, salty or bitter; compare textures using words such as “hard” or “soft,” “smooth” or “rough,” “sticky” or “not sticky”. Describe appearance in terms of shape, colour and lustre).

The students will be able to recognize the attributes of the materials used to create the recycled paper. Some of the fruits and vegetables may have different textures, shapes, colours and sizes, and therefore the appearance of the resulting recycled paper can differ.

101-4 Describe ways in which materials can be changed to alter their appearance and texture (e.g., demonstrate and describe ways of changing the rough surface of a piece of wood, such as by sanding, painting or waxing. Describe ways to obtain a particular shade or colour by mixing two or more paints).

In the process of creating recycled paper, the original materials (vegetables, fruits and used paper) are broken into smaller pieces and then softened by soaking in hot water. The appearance of the original material will be altered and the resulting recycled paper will be flat and smooth.

102-1 Create a product that is functional and aesthetically pleasing to the user by safely selecting, combining and modifying materials (e.g., make a cover or case for some objects and make a musical instrument).

Creating the recycled paper involves selecting, combining and modifying the original material (fruits, vegetables and used paper) to produce a functional piece of paper.

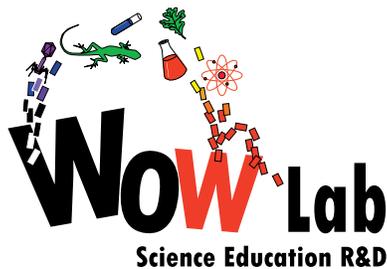
Grade 2

PHYSICAL SCIENCE

Liquids and solids

100-18 Investigate and describe the interactions of familiar liquids and solids (e.g., investigate and describe the interaction of liquids with different surfaces, powdered solids and other liquids; investigate and describe ways of changing the characteristics of liquids and solids).

Soaking the vegetables and fruits in the bleach/water solution or the used paper in the pure water solution changes the characteristics of the vegetables, fruits and used paper. Originally the fruits and vegetables have a hard texture; however, after soaking and heating them for approximately two hours, the fruit and vegetable pieces



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become very soft. The students will be able to investigate the interactions between the solid and liquid materials while creating the final product.

100-19 Identify ways to use a variety of liquids and to combine solids and liquids to make useful materials (e.g., identify liquids used in the home and describe how they are used. Investigate and describe how to make paste with flour and water or how to make cookie dough).

Recycled Paper will give students the opportunity to identify ways to combine solids and liquids to make useful materials. They can investigate and describe which materials can successfully combine to create recycled paper.

102-8 Describe and demonstrate ways we use our knowledge of solids and liquids to maintain a clean and healthy environment (e.g., describe ways to use and dispose of water. Describe and demonstrate ways to contain and store materials to prevent spilling or spoiling).

Recycling is an important concept and will be introduced to students through this activity. The students will be able to recycle material that they have in their own homes to create a new piece of paper.

Grade 3

LIFE SCIENCE

Plant growth and changes

102-13 Identify parts of different plants that provide humans with useful products and describe the preparation that is required to obtain these products and how our supply of useful plants is replenished (e.g., investigate and describe different ways of extracting materials, such as sources of sugar, fibre or colouring. Describe and demonstrate ways plant fibre can be used to make useful materials such as woven mats, ropes and homemade paper).

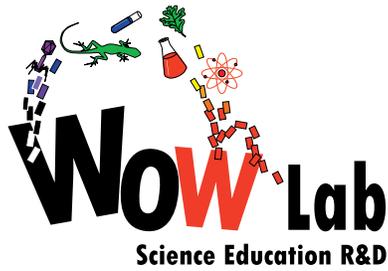
The cellulose fibers in the fruits and vegetables are used to make a useful material, a piece of homemade paper. The students will be able to identify the components of the fruits and vegetables that are used in the process of creating recycled paper.

200-1 Ask questions that lead to exploration and investigation (e.g., ask why some plants have bright flowers and some plants do not).

Providing the students with a variety of material will allow them to explore and investigate the differences between the vegetables, fruits and used paper.

200-3 Make predictions, based on an observed pattern (e.g., predict how long a particular plant can go without water before its leaves start to droop).

Knowing that cellulose fiber is needed to create the recycled paper, the students can make predictions about how the paper will form based on the different starting materials.



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Grade 5

PHYSICAL SCIENCE

Properties and changes of materials

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 be provided with instructions that they can follow to create the recycled paper. They will be able to determine that the changes to the original materials (fruits, vegetables and used paper) are not reversible.