

Kindergarten, Cluster 0: Overall Skills and Attitudes

Students will...

Scientific Inquiry

Design Process

Overview

Cluster “0” comprises nine categories of specific learning outcomes related to skills and attitudes* involved in scientific inquiry, the design process, or both. In Kindergarten to Grade 2, students are introduced to scientific inquiry through observing and measuring. Students refine their design-process skills as they progress through the grades, gradually behaving more independently in designing, constructing, and testing objects and devices. Students also acquire key attitudes, an initial awareness of the nature of science, and other skills related to research, communication, the use of information technology, and cooperative learning.

Teachers should select appropriate contexts to introduce and reinforce the scientific inquiry and design process skills and attitudes within the thematic clusters (Clusters 1 to 4) over the course of the school year. For example, students in one Grade 1 class may focus on the development of cooperative group skills while using their senses to sort and classify objects in Cluster 2, while another class may focus on these skills while testing and evaluating the suitability of materials for a particular purpose as part of Cluster 3. To assist in planning and to facilitate curricular integration, many specific learning outcomes within this cluster are accompanied by links to specific learning outcomes in other subject areas, specifically English Language Arts (ELA) and Mathematics (Math). There are also links to Technology as a Foundation Skill Area (TFS).

* Cluster 0, Overall Skills and Attitudes specific learning outcomes for this grade are also presented as part of a Kindergarten to Grade 4 chart (separate attachment). The purpose of this chart is to provide support related to the tracking of the development of skills and attitudes across several grades.

Initiating	<p>K-0-1a. Ask questions that demonstrate a curiosity about living things, objects, and events in the immediate environment. (ELA 1.2.4, 3.1.2, 3.1.3) GLO: A1, C2, C5</p> <p>K-0-1b. Make predictions as to what might happen during explorations. (ELA 1.2.1) GLO: A1, C2</p>	<p>K-0-1c. Recognize a practical problem in a given context. GLO: C3</p>
	<p>K-0-2a. Seek information from others. <i>Examples: people at school, at home, in the community...</i> (ELA 3.2.2, 3.2.4; Math SP-II.1.0) GLO: C6</p> <p>K-0-2b. Compare gathered ideas and information to personal knowledge. (ELA 3.2.3, 3.3.3; Math SP-IV.1.0) GLO: C6, C8</p>	
Planning		<p>K-0-3a. Brainstorm, with the class, possible solutions to a practical problem, and reach consensus on a solution to implement. (ELA 1.2.3, 3.1.3) GLO: C3, C7</p> <p>K-0-3b. Develop, as a class, limited criteria to evaluate an object based on its function. GLO: C3, C7</p>
	<p>K-0-3c. Select materials to be used. GLO: C2, C3</p>	
Implementing a Plan	<p>K-0-4a. Manipulate materials purposefully. GLO: C1, C2</p>	<p>K-0-4b. Construct an object to solve a problem or meet a need. GLO: C3</p> <p>K-0-4c. Identify, with guidance, improvements to an object with respect to pre-determined criteria. GLO: C3</p>

	Scientific Inquiry	Design Process
Implementing a Plan (cont'd)	<p>K-0-4d. Respond to the ideas and actions of others. (ELA 1.1.2) GLO: C5, C7</p> <p>K-0-4e. Participate in cooperative group learning experiences. (ELA 5.2.1) GLO: C7</p> <p>K-0-4f. Verbalize questions during classroom learning experiences. GLO: C6</p> <p>K-0-4g. Follow given safety procedures and rules. (ELA 2.1.2) GLO: C1</p>	
	<p>K-0-5a. Observe using one or a combination of senses. GLO: C2</p>	
	<p>K-0-5b. Describe the duration of events. <i>Examples: long time, short time...</i> (Math SS-VI.0.1) GLO: C2, C3</p> <p>K-0-5c. Record observations using drawings. (ELA 4.1.2, 4.2.5) GLO: C6</p>	
Observing, Measuring, Recording	<p>K-0-6a. Construct, with guidance, concrete-object graphs using 1:1 correspondence. (Math SP-III.2.0) GLO: C2, C6</p> <p>K-0-6b. Compare data using appropriate terms. <i>Examples: more, less, same...</i> (Math SP-IV.1.0) GLO: A1, A2, C2, C5</p>	
	<p>K-0-6c. Place materials and objects in a sequence or in groups using a single, self-determined attribute. (Math PR-I.1.0) GLO: C2, C3, C5</p>	
Analysing and Interpreting		

	Scientific Inquiry	Design Process
Concluding and Applying	<p>K-0-7a. Recognize connections between new experiences and prior knowledge. (ELA 1.2.1) GLO: A2</p> <p>K-0-7b. Describe, in a variety of ways, what was done and what was observed. <i>Examples: concrete materials, drawings, oral language....</i> (ELA 4.1.2, 4.1.3) GLO: C6</p>	
	<p>K-0-8a. Recognize that learning can come from careful observations and investigations. (ELA 3.3.4) GLO: A1, A2, C2</p>	
Reflecting on Science and Technology		
Demonstrating Scientific and Technological Attitudes	<p>K-0-9a. Be open minded while exploring. GLO: C5</p> <p>K-0-9b. Willingly observe, question, and explore. GLO: C5</p> <p>K-0-9c. Express enjoyment of science-related classroom activities. GLO: C5</p>	

Kindergarten, Cluster 1: Trees

Overview

In Kindergarten, an investigation of trees capitalizes on students' curiosity about the world around them. Students' observations of trees, including their seasonal changes, are complemented by a study of basic parts and uses of trees.

Students will...

- K-1-01 Use appropriate vocabulary related to their investigations of trees.
Include: tree, trunk, crown, branch, leaf, needle, bark, root, seed, winter, spring, fall, summer.
GLO: C5, D1, D5
- K-1-02 Identify ways in which humans and other animals use trees.
Examples: humans eat apples and walnuts; birds make their homes in trees; deer eat leaves, bark, and tender twigs...
GLO: B1
- K-1-03 Identify and describe basic parts of a tree.
Include: trunk, crown, branch, leaf, bark, root, seed.
GLO: D1, E2
- K-1-04 Explore, sort, and classify leaves, using their own classification system.
Examples: size, colour, pattern, length, shape...
GLO: C2, D1, E1
- K-1-05 Name and describe each of the four seasons.
GLO: D6
- K-1-06 Recognize that some trees lose their leaves in the fall, while others do not.
GLO: D1

- K-1-07 Describe seasonal changes in the life of a tree.
Examples: leaves of some trees change colour and drop off in the fall...
GLO: D1
- K-1-08 Investigate to determine that many trees produce seeds which are dispersed and may grow into new trees.
GLO: C2, D1

Kindergarten, Cluster 2: Colours

Overview

Colour is an important part of the world around us. Through observations and the use of specific vocabulary, students develop their ability to describe their world in terms of colour. They also explore how to create colours by mixing them and where colours are found in the environment.

Students will...

- K-2-01 Use appropriate vocabulary related to their investigations of colours.
Include: red, yellow, blue, orange, brown, black, white, purple, green, gray, pink, mix, light, dark, match, primary colour.
GLO: C6, D3
- K-2-03 Compare and contrast colours using appropriate terms.
Examples: lighter than, darker than, brighter than...
GLO: C2, D3
- K-2-02 Sort and classify objects by colour.
GLO: C2, D3
- K-2-04 Order a group of objects based on a given colour criterion.
Examples: order objects of the same colour range from lightest to darkest...
GLO: C2, D3
- K-2-05 Predict and describe changes in colour that result from the mixing of primary colours and from mixing a primary colour with white or black.
GLO: C2, D3

K-2-06 Create a colour to match a given sample by mixing the appropriate amounts of two primary colours.

GLO: C3, D3

K-2-07 Explore to identify and describe colours found in their environment.

Examples: rocks, flowers, shells, blocks, crayons...

GLO: C2, D3

Kindergarten, Cluster 3: Paper

Overview

By identifying, describing, and manipulating different kinds of paper and paper products found in the classroom, students are introduced to the concept of characteristics of materials. Hands-on investigations allow students to determine how well different kinds of paper can be cut, torn, and folded, and how these characteristics help to determine their uses. This study of paper culminates in students developing their design-process skills by constructing a paper product for a particular use.

Students will...

- K-3-01 Use appropriate vocabulary related to their investigations of paper.
Include: characteristic, thick, thin, hard, soft, smooth, rough, absorbent, pliable.
GLO: C6, D3
- K-3-02 Identify kinds of paper that can be found in the classroom.
Examples: drawing paper, paper towels, paper plates, books, newspaper, cardboard, tissue paper...
GLO: B1
- K-3-03 Recognize that paper is most often made from trees.
GLO: D3
- K-3-04 Observe and compare characteristics of different kinds of paper.
Examples: compare colour, thickness, stiffness, texture...
GLO: C2, D3
- K-3-05 Compare characteristics of different kinds of paper that make them easy or difficult to cut, tear, or fold.
Examples: cardboard is thicker than newsprint and harder to fold...
GLO: D3, E1

- K-3-06 Explore to determine an appropriate kind of paper for a particular task.
Examples: paper towels are useful for soaking up spills...
GLO: B1, C3
- K-3-07 Use the design process to construct a paper product for a particular use.
Examples: paper cup, envelope, paper mat, box...
GLO: C3