

SPECIFIC CURRICULUM OUTCOMES

Exploring My World

Unit Overview

Introduction

Science in Kindergarten needs to build on children's natural curiosity and sense of wonder. By observing and exploring the world using all their senses and by interacting with their classmates, they begin to connect their prior knowledge and experience with their experiences in new contexts to develop an understanding of the world around them. To meet the needs of these inquisitive children, the learning environment must be active, hands-on, child-centred, and inquiry-based. The teacher supports children through the problem-solving process, encouraging them to try something new, persist, and find alternative solutions. Teachers plan time for children to formally and informally share their questions and celebrate their discoveries.

Focus and Context

Students can learn about physical properties by exploring water, soil, living things, simple machines, weather and the environment. Children need time and repeated opportunities to develop the skills required for learning in science. Children need opportunities to demonstrate their learning in many ways – through representing (e.g., drawing or taking a photograph of a structure), recording (e.g., noting the number of blocks they used in order to rebuild it on another day), or discussing their investigations with a classmate (e.g., describing how they got a marble to go from the top of the marble run to the bottom).

It is important for all young children to see themselves as scientists as they investigate their world. Like scientists, they will be observing, recording their observations, making predictions, asking questions, making comparisons, investigating, drawing conclusions, and applying problem-solving skills. Science is a way of learning about or constructing understanding of the world in which we live. Developing this way of thinking and learning will lay the foundations for further learning as students continue to develop their understanding of science throughout their years in school.

Science Curriculum Links

Instructional design must reflect a balance of learning experiences focussed on specific curriculum outcomes for science and of learning experiences based on integrated explorations. Integrated learning experiences may be designed by focussing on one or more specific curriculum outcomes for science and looking for natural connections to other subject areas. Each unit includes suggestions for such connections.

The explorations of kindergarten science provide early experiences for the students which will be investigated more formally in the primary science program.

Curriculum Outcomes

The following outcomes are from *Common Framework of Science Learning Outcomes K to 12*. Column one outcomes in the four-column spreads for this topic have been developed from these pan-Canadian outcomes.

STSE/Knowledge	Skills
<p><i>Students will be expected to</i></p> <p>100-1 develop vocabulary and use language to bring meaning to what is seen, felt, smelled, heard, tasted, and thought</p> <p>100-2 explore and select different ways to represent ideas, actions, and experiences and to communicate with others</p> <p>100-3 detect consistency and pattern in objects and events and use language to describe these patterns</p> <p>100-7 describe the different ways that humans and other living things move to meet their needs</p> <p>101-1 explore how characteristics of materials may change as a result of manipulating them</p> <p>101-2 identify and explore ways to use tools to help carry out a variety of useful tasks</p> <p>102-8 describe and demonstrate ways we use our knowledge of solids and liquids to maintain a clean and healthy environment</p> <p>103-1 choose materials to build a variety of real and imaginary settings, and play roles that correspond to these settings</p>	<p><i>Students will be expected to</i></p> <p>Initiating and Planning</p> <p>200-1 ask questions that lead to exploration and investigation</p> <p>200-4 select and use materials to carry out their own explorations</p> <p>200-5 identify materials and suggest a plan for how they will be used</p> <p>Performing and Recording</p> <p>201-1 follow a simple procedure where instructions are given one step at a time</p> <p>201-2 manipulate materials purposefully</p> <p>201-3 use appropriate tools for manipulating and observing materials and in building simple models</p> <p>201-4 observe, using one or a combination of the senses</p> <p>Analysing and Interpreting</p> <p>202-1 use personal observations when asked to describe characteristics of materials and objects studied</p> <p>202-2 place materials and objects in a sequence or in groups according to one or more attributes</p> <p>202-3 identify the most useful method of sorting for a specific purpose</p> <p>Communication and Teamwork</p> <p>203-1 communicate questions, ideas, and intentions while conducting their explorations</p> <p>203-2 identify common objects and events, using terminology and language that others understand</p> <p>203-4 respond to the ideas and actions of others in constructing their own understanding</p>

Observing Living and Nonliving Things

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) living
 - (ii) non-living
 - (iii) dead/alive
 - (iv) life cycle (100-1)
- select different ways to represent ideas about living things and to communicate these with others. Include:
 - (i) chart
 - (ii) verbal (100-2)
- observe a variety of living and non-living things, using the senses (201-4)

Elaborations – Strategies for Learning and Teaching

The world of living things will provide rich opportunities for kindergarten students to use language to describe their observations, to ask questions about the world around them and to use a variety of investigations and sources to answer their own questions.

The science program should provide opportunities for focused observing. Discussing observations should be the beginning of each new experience. Students' questions about scientific phenomena will often come from their observing experiences. Careful observations will help students focus their own science work and lead them to investigate puzzles or questions that have occurred to them during observing.

Teachers should take advantage of any opportunity to ask students to describe what they see. Students will be noticing the most common aspects of objects or materials that can be best perceived through sight. These include colour, shape, size and luster (shine). These observations will build the foundation for work with properties of the materials in later grades.

Teachers should encourage development of qualitative observations, i.e., use of terms such as “nice”, “gross”, and “yucky”. Students should be helped to move to more precise descriptions such as shaped like a “cube”, “fuzzy”, “brown”, and “yellow spots”.

Students could be encouraged to make quantitative observations, i.e., using non-standard and/or standard measurements when they observe. For example, “...it is as big as a baseball”, “...as long as an unsharpened pencil” (non-standard), or, “...it is 28 kg”, “...it is 55 cubes high” (standard). Students should make their own record of observations by drawing what they see, completing a teacher-made record sheet, etc.

Teachers should be aware that students often do not make the distinction between once living (i.e., now dead), and non-living things. Living things grow and change, need food, water, air and shelter.

Observing Living and Nonliving Things

Tasks for Instruction and/or Assessment

Presentation

Students could make a collage using objects or pictures to show items that can be identified as living, non-living, dead. They could also chart the pictures and display them to the entire class. (202-2, 101-1)

Living	Non-Living	Once Living	Now Dead

Interview

Teachers could ask students, “What senses would you use to describe the following:

Living things: cat, grass, spider, horse?

Non-living: rock, bike, whistle, snow?” (201-4, 100-2)

Teachers could extend this activity by asking students, “What words would you use to describe them?” Students should use more than one of their senses in their description. (201-4, 100-2)

Performance

Teachers could divide students into five small groups representing;

1. space (hold arms in a circle in front of them)
2. water (making wave motion in front of them)
3. shelter (arms in triangle over head)
4. food (hands to mouth)
5. oxygen (sucking air in and out)

Teachers could choose one student to be a living thing (e.g., moose) and one student to be a non-living thing (e.g, rock). The living and non-living thing have to select one person from each group that represents its need(s). For example, the living thing will need to choose a student from each group while the non-living thing will only need to select space. (100-2)

Resources/Notes

My World: Living Things

(100-1)

TR Lesson 1 pp. 42-45
SR p. 2-3

Appendix B: Kindergarten Science Backpack #1

(100-2)

TR Lesson 1 pp. 44-47

Appendix B: Kindergarten Science Backpack #1

(201-4)

TR Lesson 1 pp. 43-44

Appendix B: Kindergarten Science Backpack #1

Characteristics of Living Things

Outcomes

Students will be expected to

- use personal observations to describe characteristics of living things observed. Include:
 - (i) require oxygen (from air/water)
 - (ii) require energy (food or sunlight)
 - (iii) space
 - (iv) shelter
 - (v) water (202-1)
- place materials and objects in groups according to one or more attributes (202-2)
 - classify things as living or non-living, alive and dead

Elaborations—Strategies for Learning and Teaching

A fallen leaf, while no longer living, still cannot be categorized as non-living, because it was once alive. Simply put, it is now dead. A rock, however, is non-living and it never was alive.

Teachers should note that it is unnecessary for students to recognize the terms, “oxygen” and “energy”. To help students identify these characteristics, teachers should simplify by using examples. For example, “energy” could be considered “warmth”, i.e., every living thing requires warmth, whether it is from sunlight, water, etc. Often “oxygen” is equated with “air”. This is an acceptable estimate, however, students should be reminded that oxygen is only one part of air (approximately 20%). Teachers could highlight that it is “air” (more correctly oxygen) in water that fish use.

To begin observations of living things and non-living things, the teacher can take the students on a nature walk asking them to identify things that they think are alive. This walk can be repeated at different times of the year to notice the changes in living things at different seasons. Students can stop to observe and describe what they see, hear, touch, and smell.

The walk can be varied by asking the students to look up and notice things above them. Next they can look downwards to observe. Students can close their eyes and listen for sounds of living things. (Are bird sounds different in winter and summer?)

The teacher and students could create a variety of formats for the class record of the observations and should continually add vocabulary to the class sense charts. Teachers could save observation records and photos for future review so that students can recall what happened during each part of the year.

On the school grounds or in another location, provide each pair or small group of children with a Hula Hoop. The students select a patch of ground, put down the Hula Hoop and observe everything they can see within the circle. Students can list things, count things, or draw what they observe. If the area will not be harmed by such an activity, the students can take samples, of the living and non-living things they observe within their circle, back to the classroom where they can sort living, non-living, alive or dead and make displays (e.g., collage).

Characteristics of Living Things

Tasks for Instruction and/or Assessment

Performance

On a nature walk, students could collect fallen leaves. They should observe the different stages of decomposition noting freshly fallen leaves versus dried and rotting leaves. They could be asked, “Are they all dead?” Students could produce art work, such as fall wreaths, for display. (100-3, 201-4, 202-1)

Journal

Students could illustrate some of the living and non-living things they observed on their nature walk. Teachers could help them label their illustrations. (100-2, 202-1)

Portfolio

On a chart, help students periodically (e.g., Sept., Dec., Mar., June) record height, arm length, shoe size and number of teeth. Record and compare growth and changes. (202-1, 100-3)

Presentation

Using leaves collected during a nature walk, students could make leaf rubbings and iron between wax paper. (202-2)

Resources/Notes

My World: Living Things

(202-1)

TR Lesson 1 pp. 42-45

(202-2)

TR Lesson 1 p. 45

Appendix B: Kindergarten
Science Backpack #2

Introduction to Life Cycles

Outcomes

Students will be expected to

- detect consistency and pattern in objects and events and use language to describe these patterns (100-3)
 - recognize that all living things have a life cycle
 - recognize that a life cycle involves growth and change
 - list several stages of the human life cycle
 - recognize several human attributes that change over time.
Include:
 - (i) hair growth/colour/loss
 - (ii) height/weight
 - (iii) skin wrinkles
 - (iv) teeth

Elaborations – Strategies for Learning and Teaching

Students should be exposed to life cycles in which the organism undergoes dramatic changes (e.g., frog, chicken, butterfly, etc.). Students could bring in their own books on animal life cycles to display and add to the class collection. Teachers could ask probing questions such as, “What happens to a frog in its life?” or “What are the different stages of a chicken’s life?” Teachers could connect this discussion with humans by asking, “Do human beings have life stages? If so, what are the stages?”

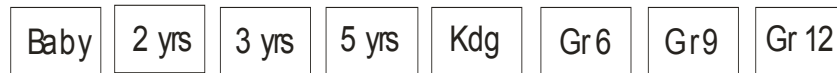
Students should discuss changes that occur in the human life cycle. They should realize that there are characteristics that do not change during the human life cycle. Teachers could read aloud books such as, *Measuring Penney* by Loreen Leedy or *Love You Forever* by Robert Munsch. Students could construct their own human timeline by using personal pictures of various stages of development (infant, toddler, pre-school, kindergarten). Students could cut out pictures from magazines to illustrate various stages (infant, child, adolescent, young adult and senior).

Introduction to Life Cycles

Tasks for Instruction and/or Assessment

Portfolio

Students could bring in pictures depicting their life at different times, (infant, toddler, present) and record on a timeline to put in their portfolio. Students could draw a picture of how they might look in future stages.



(100-3)

Presentation

Teachers could invite a grandparent (or great-grandparent) to answer student questions about the various stages of their life. The grandparent could bring photographs of themselves at various ages to highlight the changes in their appearance. Students could be challenged to examine earlier photographs and find the grandparent in a group of people. (100-3)

Journal

Students could write and/or illustrate a response to the grandparent presentation in their journal. They could write/illustrate about their favourite part. (100-3)

Resources/Notes

My World: Living Things

(100-3)

TR	Lesson 1	pp. 44, 45, 48
	Lesson 2	pp. 52, 53, 56, 57

Appendix B: Kindergarten Science Backpack #3A

Appendix B: Kindergarten Science Backpack #3B

A Closer Look at Plants

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) plant
 - (ii) seed
 - (iii) leaf/stem/roots/flower (100-1)
- observe consistency and pattern in plants and use language to describe these patterns. Include:
 - (i) biggest-smallest (size)
 - (ii) number
 - (iii) colour
 - (iv) texture (100-3)
- follow a simple procedure where instructions are given one step at a time (201-1)
- manipulate materials purposefully (201-2)
- ask questions that lead to exploration and investigation (200-1)
 - recognize the purpose of a root system
- communicate questions, ideas, and intentions while conducting their explorations (203-1)

Elaborations—Strategies for Learning and Teaching

The teacher could create a display of a variety of plants (e.g., cactus, flowering plant, vegetable, a cutting with roots in a clear container, or a small tree, etc.). Students could observe these samples closely to discover how they are alike or different (e.g., size, colour, number of leaves, smell, etc.). Students could also select a favorite plant, draw and label as many details as possible. Each student could tell the class why the plant is his/her favorite, using the pictures as a visual aid.

Using donated, used magazines, students could cut out pictures or images of plants. Teachers could ask students to categorize or group the images based on one attribute (i.e., a dicotomus key such as, a flower - not a flower, a tree - not a tree, or green - not green, etc.). Once the images have been sorted into two groups, students could further categorize one of the groups. For example, if students initially grouped the images based on tree - not a tree, they could further examine the group of tree images. Students could sub-divide the “tree” group based on leaves (deciduous) or needles (coniferous). If seasonal pictures are available deciduous and coniferous could also be determined by the colour of the leaves or if the tree has leaves. Finally, students could rank the pictures based on size. Note the pictures would require a reference object (i.e., a car, house, person, etc.) to indicate the size of the tree. Once they have finished grouping, students could create a collage representing their favourite season, colour or tree.

In the Fall, if conditions permit, students could collect leaves and rank them biggest to smallest, or by colour. They could explore texture by penciling a rubbing of a leaf’s surface. A leaf is placed under a piece of thin, white paper and the student, holding the pencil on its side, gently marks the paper so that the leaf image is evident on the paper.

Students could bring in cuttings and place some in glasses with water and some in empty glasses. Students should predict the outcomes and observe that the plant placed in water will grow roots. Students should realize that without water or roots the plant would die. Students should grow their own plant from a seed. They should observe and record growth and change over time. (Marigolds and beans have excellent germination for this activity.)

A Closer Look at Plants

Tasks for Instruction and/or Assessment

Performance

Students could examine a “plant in a box” apparatus. The plant in a box is an example of a plant’s growth towards a light source. The teacher can place a small bean plant (or other fast growing plant) in one corner of a shoe box. Within the box a maze of barriers (with small openings) can be constructed. Another small opening is placed in the opposite end of the box. The bean plant will grow “through the maze” to reach the light source. Removing the box top would illustrate the plant’s growth. (201-4, 200-1)

Students could sort objects, pictures or illustrations as “plants” or “not plants”. Kidspiration, a concept-mapping program for students, could be an excellent software to assist with this activity. Students could complete **Activity 1 (Appendix A)**, *Plants or Not Plants*. (100-3, 100-1, 201-1)

Students could complete **Activity 2 (Appendix A)**, *Let’s Look at Seeds*. Students could explore a variety of seeds (e.g., acorns, pine cones, corn, sunflower and pumpkin) using their senses and categorize these based on various attributes. Students should be asked to explain their sorting rule(s). (100-1, 201-2, 203-1)

Students could observe several aspects of plant growth by viewing a living plant growing between two pieces of clear glass/plastic. This apparatus (e.g., Root Vue Farm) can be purchased through primary science supply companies. In this apparatus, the direction/diversity of root and stem growth can be easily observed. (200-1)

Resources/Notes

My World: Living Things

(100-1)

TR Lesson 2 pp. 49-53
SR pp. 4-5

Appendix B: Kindergarten Science Backpack #4A

(100-3)

TR Lesson 2 p. 50

Activity 1: *Plants or Not Plants*, Appendix A

Appendix B: Kindergarten Science Backpack #4B

Activity 2: *Let’s Look at Seeds*, Appendix A

(201-1, 201-2, 200-1)

TR Lesson 2 p. 51

Appendix B: Kindergarten Science Backpack #4A

Appendix B: Kindergarten Science Backpack #4B

(203-1)

TR Lesson 2 p. 51

A Closer Look at Plants *(continued)*

Outcomes

Students will be expected to

- detect consistency and pattern in plant growth and use language to describe the pattern (100-3)
 - given pictorial representations, organize a plant life cycle in its appropriate order.
- observe, using one or a combination of the senses (201-4)
- place materials and objects in a sequence or in groups according to one or more attributes (202-2)

Elaborations—Strategies for Learning and Teaching

Students can return to the donated magazines and cut out pictures of plants at various stages of a life cycle, and organize them in sequential order. Students should observe that this order, similar to the humans, occurs in a cycle. Teachers could read aloud the book, *Pumpkin Pumpkin* by Jeanne Titherington and discuss the pumpkin plant's life cycle.

There are many short movies and animations that illustrate the life cycle of a plant that students would find engaging. A pumpkin plant is an excellent example to explore because in its life cycle, it undergoes dramatic change in structure, size and colour (as well it may be familiar to students). After viewing a movie or book depicting the various stages of the pumpkin life cycle, students could create a class display illustrating the stages. Small student groups could be assigned individual stages. Each group would draw the plant in that stage (i.e., seeds, small plant, flowering plant, early pumpkin growth, etc.) and place their drawing in the proper sequence on a bulletin board. Students could be asked to label the stages and/or any plant "parts" they know.

Students should observe and describe plants using a variety of senses (not taste). Students should be encouraged to answer questions such as; "What does it smell like?" "What does it feel like?" and so on. Students could be challenged to pick the "smoothest", "smelliest" or "greenest" plant.

Students could investigate important or significant plants to Newfoundland and Labrador culture. For example, students could observe the provincial flower, the Pitcher plant, and discuss where it grows and how it gets its food. Teachers should note, this is a protected plant and so it shouldn't be picked or otherwise harmed. Native berry plants (e.g., blueberry, bakeapple, partridge berry, etc.) are also widely available for student activities. Students could go on a field trip to explore various types of plants in their natural habitat. Parks, gardens, schoolyard and walking trails all present excellent opportunities to observe plants and their growth characteristics.

Students should revisit their plant display and sequence the plants according to various attributes (e.g., biggest to smallest leaves, most/fewest leaves, or fattest leaves, etc.).

A Closer Look at Plants *(continued)*

Tasks for Instruction and/or Assessment

Performance

Students could act out the growth of a plant from a seed (tiny and crouched down on the floor), to germination, growth and blooming (they slowly move up straight, with arms stretching out for leaves and/or flowers). (100-3)

Students could mimic a natural environment that is not native to Newfoundland and Labrador by planting a cactus. This type of plant requires a rocky substrait and dry, sandy soil. Infrequent watering would further illustrate that not all plants have the exact same requirements for successful growth. (100-3)

Presentation

Students could create their own flowers and present them to the class. There are many methods for students to create their own flowers. One good example involves using coffee filters and water soluble ink. Using these materials, students could colour coffee filters using the water soluble markers. Once finished, students should lightly spray the filter with water and let dry. The ink will run and produce beautiful patterns. They can then attach a pipe cleaner for a stem and a leaf. (201-4)

Resources/Notes

My World: Living Things

(100-3)

TR Lesson 2 pp. 52-53

Appendix B: Kindergarten Science Backpack #4B

(201-4, 202-2)

TR Lesson 2 p. 50

Appendix B: Kindergarten Science Backpack #4B

A Closer Look at Animals

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) animal
 - (ii) wild/domestic
 - (iii) habitat
 - (iv) adapt (100-1)
- detect consistency and pattern in animal development and use language to describe these patterns (100-3)
 - list several stages of an animal's life cycle (e.g., frog or bird)
- detect patterns in animal features and use language to describe the patterns (100-3)
 - recognize that animals have distinct patterns on their coats/skin/scales

Elaborations—Strategies for Learning and Teaching

Students could discuss that an animal is a living thing, but it is not a plant because it can move from place to place. Teachers could develop a Venn diagram to illustrate the differences between plants and animals. Animals have locomotion, plants make their own food, animals have a nervous system (i.e., some can see, hear, taste, etc.), plants have special parts (i.e., leaves, stems or roots).

Teachers could provide an assortment of magazines and/or pictures depicting various animal life cycles (Note: the Internet is a good source of pictures). Examples may include frog, spider, butterfly. Allow students an opportunity to cut out pictures of animals in the various stages and place them in sequential order.

Students could find and bring in various pictures of animals with distinct patterns on their bodies (or body parts). They could discuss the patterns and the reasons for the patterns (e.g., camouflage, scare predators, etc.). Teachers could read aloud the book, *Butterfly Alphabet* by Kjell B Sandved.

Students could discuss ways that animals camouflage themselves for survival. Students could select an animal to draw and cut out. On a separate sheet of paper they could create an “environment” in which their animal can be camouflaged. Teachers could pose questions such as; “where an animal can live and why?” Students could try to find each others animals in a camouflage display.

Teachers could read aloud the book *Grandfather Tang* by Ann Tompert. Students could then create their own animals using the tangram pieces. Note, students would not need to identify the shapes. Students could also paint their animals on a poster and display to the rest of the class. This would be a good opportunity to integrate mathematical concepts (such as geometric shapes).

A Closer Look at Animals

Tasks for Instruction and/or Assessment

Performance

Students could make puzzles of frog life cycles. Each student could pick one stage in a frog's life cycle and draw it on a paper plate. Students could cut their plates into no more than eight pieces, and place these pieces in a paper bag. All bags could be collected and placed in the middle of the floor. Each student could take a turn picking a bag, assembling the puzzle and guessing what stage of a frog's life it is. (100-3)

Teachers could make mother and baby animal puzzles. Teachers could find a variety of pictures of mother and baby animals. These should be mounted on cardboard and cut apart in an irregular shape. Students can put puzzles together by matching mother to baby. (100-3)

Using wallpaper samples, students could cut out animal shapes. By placing these cut outs on top of a larger piece of the wallpaper, students can observe their animal cut outs camouflaging with their backgrounds. (100-3)

Students can use movement to explore how a frog travels. Students could begin at one end of a room while a "caller" stands at the other end. The caller tells the others how to move. The caller begins by calling out either "egg", "tadpole", or "frog". "Egg" means to freeze and stand still like an egg, "tadpole" means to get down on the ground and "swim" and "frog" means to hop. The first student to reach the caller then becomes the new caller. (100-3, 202-1, 100-7)

Students could make a class book of illustrations of imaginary animals. Each "animal" should have a creative and distinct pattern. Students should include some features discussed (e.g., movement, camouflage, environment, etc.) Students should name their creations and present to the class. (100-3, 100-7, 202-1)

Resources/Notes

My World: Living Things

(100-1)

TR	Lesson 3	pp. 54-57
SR		pp. 6-7

Appendix B: Kindergarten Science Backpack #6B

(100-3)

TR	Lesson 1	p. 48
	Lesson 3	p. 57

A Closer Look at Animals *(continued)*

Outcomes

Students will be expected to

- use personal observations when asked to describe characteristics of animals studied. Include:
 - (i) they have fur feathers/scales/skin
 - (ii) they have legs/fins/tails/wings
 - (iii) they make distinct sounds (202-1)
- recognize distinguishing body features that help an animal meet its needs. Include:
 - (i) claws, fangs and beaks
 - (ii) acute hearing and eyesight
 - (iii) gills and tails
 - (iv) distinct movement (100-7)
- describe the different ways that animals move to meet their needs. Include:
 - (i) running
 - (ii) hopping
 - (iii) swimming
 - (iv) flying (100-7)
- place animals in groups according to one or more attributes (202-2)
 - classify animals as domestic or wild
 - recognize that some domestic animals are pets
- observe pets, using one or a combination of the senses (201-4)

Elaborations—Strategies for Learning and Teaching

Using collected pictures of various animals, students could brainstorm ways they are the same or different. In groups, students can sort pictures according to different characteristics and record and share with the class. A possible theory is that adaptations are a result of an organism changing to meet its needs. For example, rabbits change colour depending on the season.

Teachers could assign students to bring in pictures of a variety of animals with specific body features. For example, one student could be asked to bring in a picture of an animal that has claws, another student could be asked to bring in a picture of an animal with feathers, and so on.

Teachers could lead the students in a discussion on the purpose of animal movement. Students should realize that animals gather food or water, as well as migrate and hibernate. Students could play games such as animal charades and Simon Says to show how animals move, e.g., hop like a frog, fly like a bird, slither like a snake.

Students could cut out pictures of animals from magazines. These pictures could be placed on a T-chart, labeled Pets (Domestic)/Not Pets (Wild).

Teachers could create a schedule for pets to visit the classroom. Alternatively, a teacher may arrange for an animal breeder to visit, or for the class to visit a local SPCA. The pet owner makes a brief presentation about the pet and then the class makes and records observations. Students should observe characteristics such as teeth, wings, number of legs, colour, skin covering, how it breathes, how it eats, and how it moves. Records can be made using charts and photos of each visiting pet. In the visiting pets activity, teachers and students can create a common format for recording observations of each pet.

A Closer Look at Animals *(continued)*

Tasks for Instruction and/or Assessment

Presentation

Students could complete **Activity 3 (Appendix A)**, *Log Hotel*. In this activity students observe a log and what is found on, around, and in a rotting log to determine how a log is a home for living things and how living things depend on the log to survive. (100-7)

Performance

Students could complete **Activity 4 (Appendix A)**, *Insect Party*. In this activity students pretend to be insects and use common objects such as popsicle sticks and chopsticks to eat small pieces of food (e.g., small pieces of fruit and vegetables). (100-7)

Students could play a game of Head Bands™ with pictures of animals. In this game students place, without looking at it, a picture of an animal on their forehead. Next, they move around the room asking other students questions to discover the identity of their animal. For example, “Do I have claws?”, “Do I swim?” or “Do I eat bugs?”. (202-1, 100-7)

Journal

Students could draw a picture of their pet or a pet they would like to have. Teachers could help children write a brief description of their pet. (202-1)

Paper and Pencil

Students could draw and label animals on small pieces of paper, fold these in half and place in a bowl. Each student should get a turn to choose a piece of paper from the bowl. Without revealing the name of the animal, each student could describe the animal and its behaviour. This can be done in small groups. (202-1)

Resources/Notes

My World: Living Things

(202-1)

TR Lesson 3 pp. 56-57

Activity 3: *Log Hotel*, Appendix A

Activity 4: *Insect Party*, Appendix A

Appendix B: Kindergarten Science Backpack #5A

(100-7)

TR Lesson 3 p. 57

Appendix B: Kindergarten Science Backpack #5B and #5A

(202-2)

TR Lesson 3 pp. 55-57
SR pp. 6-7

(201-4)

TR Lesson 3 p. 57

Animal Homes

Outcomes

Students will be expected to

- choose materials to build a variety of real and imaginary habitats (103-1)
- explore how characteristics of materials may change as a result of manipulating them into a habitat (101-1)
- manipulate materials purposefully (201-2)
- follow a simple procedure to build a beaver dam or bird nest where instructions are given one step at a time (201-1)

Elaborations—Strategies for Learning and Teaching

Students could collect some spiders (or other insects) and build a house for them. Students can observe and feed spiders while looking at them in a natural habitat. Deciding what to feed them can be a group discussion. Observations of spiders can include what they do, their body parts, and their webs. Students can magnify and draw the spiders and the webs. Students can create a giant spider web by passing a ball of yarn to spin a web. One student holds the ball of yarn and says something about spiders and webs, then that student holds on to the strand of yarn as he or she gently tosses the ball to the next person. The student who catches the ball now has a turn to say something he or she knows about spiders or webs and tosses the ball to another person. This is continued until a web has been “woven” and everyone is holding a strand. Use of language to describe the web, the spider, and its life can extend the students’ vocabulary. Students could create a journal or diary with pictures about the spider and its home.

Students should have an opportunity to create an animal home. Students could build a home out of recyclable and scrap materials and decorate it with paint, markers, or fabric. Students could take turns explaining their habitats and the kinds of animals that would live there. When the homes are dry, children may want to make the animal (or animals) which live in the built habitat.

Students could construct a beaver dam by experimenting with sticks, clay and sand, to hold back water in a tub. This would also allow students to observe which materials best hold back water and how different materials work when used together. Observations and discoveries should be discussed and connected to how a beaver builds a lodge or dam.

Students could brainstorm about the sizes of different nests, where they are found, what materials are used and which birds make which kinds of nests. Using materials collected from outdoors, together with clay, glue or yarn, students can work in small groups to construct nests. Groups can discuss their nests and the birds that might live there.

Animal Homes

Tasks for Instruction and/or Assessment

Paper and Pencil

Students could create a flap book that would allow users to see the home and then guess the animal that would live there. Each student would be given a sheet of paper with a line drawn horizontally across the middle of the page. On the bottom half, they should draw an animal home or habitat. On the top half of the page, they should draw the animal that lives there. Teachers should help students staple half sheets of heavy paper to the top of the upper half of the page, creating a flap to cover the animal. All pages should be collected and bound together. Students can look at the habitat pictures and guess what animal would live there, and lift up the flap to see the answer. (100-7)

Performance

Students could construct a habitat for an insect of their choice. Using empty boxes and such materials as paper towel tubes, students can simulate general environments, structures and even food for the insect. These habitats can be displayed together to make a Habitat Museum. Students could take turns explaining their habitat designs to the class. (103-1, 101-1, 201-2)

Students could role-play their favorite animal. Students could construct a habitat for the animal that they are portraying. They could use large boxes, chairs, tables, blankets or sheets. When the habitats are complete, children could act out the activities their animals do in their homes. (103-1, 101-1, 201-2)

Resources/Notes

My World: Living Things

(101-1, 103-1, 201-2)

TR Lesson 4 pp. 60, 62, 63

Appendix B: Kindergarten Science Backpack #6A and #6B

Appendix B: Kindergarten Science Backpack #6A

(201-1)

TR Lesson 4 p. 60

Observing Things Around Us

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) set
 - (ii) properties (smooth, rough, colour and shape)
 - (iii) sort (100-1)

Elaborations – Strategies for Learning and Teaching

The senses can be used for observing, describing, sorting, and exploring. The primary science and math programs include a variety of collections that can be added to the classroom from time to time, either in learning centres or as manipulative materials for whole-class exploration.

Students should be asked to observe using their five senses and describe their observations as they begin working with each new collection.

As the students use their senses, teachers should add words and phrases to a senses chart that describe their perceptions. Some touch words that may be suggested include smooth, flat, wet, moist, damp, dry, crisp, firm, flabby, gummy, sticky, woolly, spongy, velvety, furry, silky, soft, cold, cool, chilly, hot, warm, sleek, slippery, slimy, greasy, oily, rough, bumpy, jagged, pointed, and sharp. Some smell words include stinky, foul, pleasant, sweet, fruity, perfume and floral. Some hearing words include loud, soft, quiet and noisy. Some visual words include bright, dark, dull and dim. Some taste words include sweet, salty, sour, yucky, yummy and bitter. Teachers should provide experiences with a wide variety of objects and materials to ensure that students have the opportunity to use the kind of vocabulary suggested here.

Teachers should gather a variety of objects and materials with distinctive textures. The collection can be stored and displayed in a variety of ways. With the students donating a page, teachers can make a class touch book, bags of individual objects or materials, often called “feelie bags,” or shoe box collections. Students could explore objects with their eyes closed or wearing blindfolds. They could record their descriptions of the different textures on the touch chart. Teachers could extend the vocabulary by introducing new words that are appropriate to the objects in the collections.

Observing Things Around Us

Tasks for Instruction and/or Assessment

Presentation

Students can bring a toy/object from home and share with the class. Teachers should encourage students to use all five senses when describing their toy/object. One creative way to present this is for the teacher to provide a “mystery box/tin” and a class journal. Each student, in turn, will bring home the “mystery box/tin” in which they will place their toy/object. The student can write three clues about their mystery item and illustrate it in the journal. The student could present his/her clues to the class and have them guess the mystery item. (100-1, 202-1)

Performance

Teachers should provide a variety of objects and materials with distinct textures. For example, sandpaper, felt, shiny paper, fur and carpet. Students could sort objects/materials based on the characteristics of the texture of the material. (100-1)

Students could complete **Activity 5 (Appendix A)**, *Developing a Touch Vocabulary*. In this activity students demonstrate and extend their “observation” vocabulary. Students should develop a touch chart and add words and phrases. Teachers should provide experiences with a wide variety of objects and materials. Teachers could take the students outside to expand their experiences with touch. Discuss safety issues in doing this. Note, teachers may wish to use a digital camera to take pictures of the objects used and place them by the vocabulary words developed. (100-1)

Resources/Notes

My World: Things We Use

(100-1)

TR	Lesson 5	pp. 64-67
SR		pp. 2-3

Activity 5: *Developing A Touch Vocabulary*, Appendix A

Appendix B: Kindergarten Science Backpack #7A

Appendix B: Kindergarten Science Backpack #7B

Observing Things Around Us *(continued)*

Outcomes

Students will be expected to

- identify common objects and events, using terminology and language that others understand. Include:
 - (i) colour
 - (ii) texture
 - (iii) size
 - (iv) shape (203-2)
- use personal observations when asked to describe characteristics of materials and objects studied (202-1)

Elaborations—Strategies for Learning and Teaching

Students should take turns selecting a mystery object that can be seen by everyone in the class and describing the object with a few slight clues. For example, “I spy with my little eye something that is round, as big as a cookie, and blue.” Other students look around for specific objects and make guesses. This might be a good warm-up to class meeting time, science time, or waiting time such as line-up for movement through the building to some event or class. Provide the clues from time to time to extend difficulty level and ensure that all students are challenged.

Students could continue to use the mystery object activity to engage the students in using their senses in a focused way. As the students gain experience, they should use three or more senses to make guesses or ask questions about the mystery object.

Teachers should gather a collection of objects that are transparent, such as plastic bottles, plastic bags, lenses, see-through containers, and plastic wrap, and objects that let light through but cannot be seen through. Ask students to try and look through each object. What can they see? Ask them to put the objects into groups: “good for looking through” and “not so good for looking through”. Students could observe through the objects and materials that can be seen through. Students should try to describe what they see. **Teacher Note:** *Students are not expected to know transparent, translucent, and opaque. Teachers should know these words and meanings so that they can answer any questions.*

Observing Things Around Us *(continued)*

Tasks for Instruction and/or Assessment

Paper and Pencil

Students could record an “I Spy” riddle on paper and then compile all riddles into an “I Spy” riddle book. (203-2, 202-1)

Performance

Students could complete **Activity 6 (Appendix A)**, *Where Did The Colour Go?* In this activity students choose one colour of food colouring and place a few drops of it in a plastic container. They add water and put the lid on the container. Students should look at objects through the sides of the container. Students should draw what they observed. (200-4)

Journal

Students could complete **Activity 7 (Appendix A)**, *Our World In Colour*. In this activity students should observe objects carefully and tell the class or their partners what they saw. Teachers should provide plastic magnifiers, and ask students to look at the same objects and materials again. Ask them to describe the differences they observed (looks large, more detail ...) in their journal. (203-2, 100-1)

Paper and Pencil

Students could complete **Activity 8 (Appendix A)**, *Picture the Texture*. In this activity students choose an item(s) they wish to do texture rubbings on. Take students outside to make rubbings of tree bark, licence plates, leaves, etc. They should explain the process for doing it and record the name of the object and its texture. (203-2, 100-1)

Resources/Notes

My World: Things We Use

(203-2)

TR Lesson 5 pp. 65-66

Activity 6: *Where Did The Colour Go?* Appendix A

Activity 7: *Our World In Colour*, Appendix A

Activity 8: *Picture The Texture*, Appendix A

(202-1)

TR Lesson 5 pp. 65-66

SR pp. 2-3

Appendix B: Kindergarten Science Backpack #7B

Observing Things Around Us *(continued)*

Outcomes

Students will be expected to

- place materials and objects in a sequence or in groups according to one or more attributes Include:
 - (i) colour
 - (ii) texture
 - (iii) size
 - (iv) shape (202-2)

- communicate ideas and intentions while conducting sorting explorations (203-1)

Elaborations – Strategies for Learning and Teaching

In small groups, students should look at a collection of objects carefully and tell the class or each other what they see. Teachers should ask them to place the objects in groups and tell the sorting rules. When students are working with a collection of objects that vary in a particular property such as length, heaviness, or texture, teachers should notice whether the student is able to place the objects in a serial order according to that property. For example, can the student order a set of twigs from the shortest to the longest?

Teachers could take students outdoors (or this could be attempted in the classroom) and ask them to look up and tell their partner everything they can see. Teachers should ask what do they notice? What colours do they see? Were there any surprises? Students might draw a diagram/picture of the things they observed. If the experience is conducted outdoors and on a day with distinctive clouds against a blue sky, teachers could provide students with cotton batting or felt scraps to create a visual representation. This could be repeated on a another day except students would focus downward.

Students should experience a challenging colour walk or colour search. This activity could be created (or enhanced) by using colour chips from a hardware store paint display. Teachers could provide each student or pair of students with a small number of colour chips and ask them to find something in the classroom or other designated environment that matches each colour chip. **Teacher Note:** *Some students may suffer from varying degrees of colour deficiency.*

Observing Things Around Us *(continued)*

Tasks for Instruction and/or Assessment

Performance

Teachers could share the book *Look Up, Look Down*, by Tana Hoban. After sharing the book, students could be given paper towel tubes and encouraged to explore the classroom by viewing it through the restricted view of the tube. Students should illustrate one of the views they observed. (202-1)

Paper and Pencil

Teachers should provide catalogues, flyers, and magazines so that students, in small groups, can select and cut pictures of objects found inside and outside the classroom. Paste them on a T-chart that is titled inside the classroom - outside the classroom. (202-2, 203-1)

Students could trace an outline of their foot on paper and cut it out. Working as a class, they should organize the outlines in sequence, from smallest to largest. (202-2, 203-1)

Resources/Notes

My World: Things We Use

(202-2, 203-1)

TR Lesson 5 pp. 65-67

Using Things Around Us

Outcomes

Students will be expected to

- identify and explore ways to use materials to help carry out a variety of useful tasks (101-2)
 - recognize that materials are appropriate for certain uses based on their properties
- select and use materials to carry out their own explorations (200-4)
- manipulate materials purposefully (201-2)
- respond to the ideas of others in constructing their own understanding (203-4)
 - explain their choice of materials based on the purpose of their structure
 - explain that materials may have many different uses
- use appropriate tools for manipulating and in building simple models (201-3)
- select different ways to represent their plan, and process of construction, to communicate with others (100-2)

Elaborations—Strategies for Learning and Teaching

Teachers should display a variety of simple tools familiar to students (e.g., scissors, pencil, can opener, wrench, shoe horn). Teachers should ask the students what they think the tool is used for and whether one tool could be used for another purpose. For example, “Can a wrench cut a piece of paper?” “Can we open a tin of soup without a can opener?”

Students could examine different materials (e.g., sponge, wood, paper towel, brick, rag) and be challenged to clean up a water spill. Students could determine which one works better and why. Students could rank the materials based on ability to “soak up” water.

Students should visit a playground (or examine detailed pictures of a playground). Students should examine the various pieces and record the shape, size, location, number of parts, etc. Students could choose a “favourite” piece and describe its parts and what they do. For example, students may describe the flat part of a merry-go-round as “rough” so that they do not slip off; or the shute surface of a slide as smooth with edges so that they go fast but not slide off.

In preparation of model building, teachers should ask students what materials at home could be used to make their favourite piece of playground equipment. For example, teachers could ask them to bring materials to create a model slide. Teachers could provide some sample materials in class (sand paper, fuzzy material, etc.). Students should create model slides and discuss and compare the design of their models. Teachers should encourage students to add features or materials that enhance safety. Teachers could ask, “Why did material A work better than material B?” or “What is this part for?”

Students should be reminded that playground equipment is designed to be both fun and safe.

Using Things Around Us

Tasks for Instruction and/or Assessment

Presentation

Each student could bring in a simple tool from home and present it to the class. Students should describe their tools and explain what they are used for. (203-4, 201-3)

Journal

Students could illustrate/write about a “simple tool”. (101-2, 203-4)

Performance

Teachers could provide pictures of simple machines and place them in a bag. Individual students could pick one picture and act out its use(s). The other students could guess which machine might it be. (101-2, 203-4)

Resources/Notes

My World: Things We Use

(101-2, 200-4, 201-4, 201-3)

TR Lesson 6 pp. 68-72

Lesson 7 pp. 73-77

SR pp. 4-5

pp. 6-7

Appendix B: Kindergarten Science Backpack #8A

(203-4)

TR Lesson 7 p. 76

(100-2)

TR Lesson 7 pp. 76-77

Using Things Around Us *(continued)*

Outcomes

Students will be expected to

- describe and demonstrate ways we use our knowledge of materials to maintain a healthy environment. Include Reduce, Reuse and Recycle (102-8)
- identify materials and suggest a plan for how they will be used (200-5)

Elaborations – Strategies for Learning and Teaching

Teachers could provide a variety of recyclable materials to students to decide how they may have additional value (e.g., reused for another purpose, used by another person who needs it, etc.). Teachers should discuss with the students the potential uses of the recycled material (e.g., egg carton, paper towel rolls, popsicle sticks, paper, blocks, styrofoam, etc.). Students should select from the materials and predict for which job it could be best suited. For example, students could be asked, “What can we do?” Possible answers could include:

- 1) We can use plastic containers for lunches and use cloth bags for carrying groceries (reducing).
- 2) We can donate used toys or clothes to other people (reusing).
- 3) We can collect materials such as juice boxes, newspapers, bottles, etc., from home or school and return for reuse (recycling).
- 4) We can save food scraps and set up a composting bin to feed the garden (composting).

Using Things Around Us *(continued)*

Tasks for Instruction and/or Assessment

Performance

Students could set up a classroom recycling program (paper, juice boxes, etc.). They should record the amount of material collected. Students could compare the amount recycled with the change in the amount of waste removed from the classroom. (102-8, 200-5)

Students could make a bird feeder out of recyclable materials and place it in the school playground. (Don't forget to place it in a high location, otherwise animals will eat the food or attack the birds.)

They should place food in it and watch for visitors. (200-5)

Journal

Students could write or illustrate how they reduce/reuse/recycle in school and at home. (102-8, 200-5)

Paper and Pencil

Using magazines, catalogues, flyers, students could cut out images of people reducing, reusing and recycling. Students could arrange them in a poster or ad to promote a healthy environment. (102-8, 200-5)

Resources/Notes

My World: Things We Use

(102-8)
TR Lesson 8 pp. 78-83
SR p. 8

Appendix B: Kindergarten Science Backpack #8B

(200-5)
TR Lesson 8 pp. 81-83
SR p. 8

Appendix B: Kindergarten Science Backpack #8B

Observing Local Weather

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) observation
 - (ii) graphing
 - (iii) recording
 - (iv) weather cycles (100-1)
- use personal observations when asked to describe weather characteristics (202-1)
- observe, using one or a combination of the senses (201-4)
 - recognize that scientific observations are usually very specific and objective

Elaborations – Strategies for Learning and Teaching

As part of the morning routine, the teacher should complete a weather chart/graph (daily, weekly, monthly) by recording the weather based on students' observations. Teachers should have a weather chart, and a pictograph or bargraph as part of their calendar bulletin board. This should be user friendly so that students can add to it each day. These graphs could be kept to create a class weather booklet which will be needed later in order to compare and discuss the weather cycle (seasonal changes). Students should realize that our weather has a cycle (patterns). Weather words should be introduced as needed. Students should become familiar with terms such as windy, foggy, sunny, cloudy, rainy, snowy, warm, hot, cold.

Over the course of this unit the teacher should read texts that show students different kinds of weather and the seasonal changes that take place. The teacher should lead the students in a discussion about what activities they do during each season and what types of clothing they need for that season.

The teacher could bring in weather props (clothing, etc.) which children are familiar with. Place them in a pile on the floor. Then the students could be divided into weather teams. (The teacher will have already put types of weather on slips of paper). Each team can pick a type of weather from a hat (not letting other teams know what type of weather they have). Each team could select all of the props that go with the weather their team picked. Once all props have been chosen, the students could dress for the weather. The other teams will have to guess what type of weather they are dressed for and explain why.

When discussing what it is like on a given day the teacher should respond to students observations by asking them "How do you know it is windy, sunny, warm, cold, etc.?" Students responses should be that they can feel it, see it, smell it or hear it. The teacher could introduce the students to the weather forecast by having them refer to various media (i.e., TV, radio, Internet, newspaper). The teacher could also lead children in a discussion about how this information is collected scientifically.

Observing Local Weather

Tasks for Instruction and/or Assessment

Journal

Students should write in their journals about their favourite season. They could tell what they like about their season, what activities they engage in, and what special clothing they would need to wear. (100-1, 201-4, 202-1)

Students could draw a picture of how their team was dressed and write a sentence telling what type of weather their team represented. (201-4, 202-1)

Portfolio

Students could record individually the weather each day for one particular month and create a picto/bar graph for that month. (100-1)

Presentation

Students could create a poster depicting the activities/clothing for each season. For this they will need magazines/catalogues from which to cut pictures. This activity can be completed in groups or independently. Teachers should ensure that students represent the cyclical nature of the seasons. (202-2)

Performance

Students will tell what it is like today and predict the weather forecast for tomorrow. Each student could be responsible for a particular day. The information could be collected by watching TV, listening to the radio, using the Internet or reading the newspaper. The students could present it in front of the class or over the school PA. (100-1, 201-4, 202-1)

Resources/Notes

My World: Things We Use

(100-1, 202-1, 201-4)

TR Lesson 9 pp. 84-88

SR pp. 2-3

TR Lesson 10 pp. 89-93

SR pp. 4-5

Appendix B: Kindergarten Science Backpack #9

Observing Local Weather *(continued)*

Outcomes

Students will be expected to

- detect consistency and patterns in weather events and use language to describe these patterns. Include the terms:
 - (i) windy
 - (ii) foggy
 - (iii) sunny
 - (iv) cloudy
 - (v) rainy/snowy
 - (vi) warm/hot/cold (100-3)

- place materials and objects in a sequence or in groups according to one or more attributes (202-2)
 - classify and chart the weather over a period of time
 - classify the period of time into one of the four seasons

- identify common events, using terminology and language that others understand (203-2)
 - recognize that weather lore has been used to predict weather

- use and record personal observations when asked to describe the process of making rain (202-1)
 - recognize that the process of rain making is a cycle
 - recognize that this cycle is similar to what occurs in nature

Elaborations—Strategies for Learning and Teaching

The teacher should take the children outside at different times throughout the year to observe the weather. Students could also look at pictures and books of various seasons to compare and contrast the weather. Teachers should continue to encourage students to use scientific terms when describing weather (e.g., windy, cloudy, warm/hot/cold, etc.).

The teacher could read a book about the seasons such as, *The Four Seasons*, by Rozanne Lanczack Williams and discuss with the students the four seasons. The teacher could refer to the class weather booklet that was created during morning routine and classify each month into one of the seasons.

The teacher should introduce students to weather lore and discuss how it is used to predict weather. Some popular weather lore are:

- Red sky at night, sailors' delight. (This means that the next day will be sunny.) Red sky in the morning, sailors take warning. (This means that bad weather is on the way.)
- Ground hog. If the ground hog sees its shadow, we are supposed to have six more weeks of winter.
- March – In like a lion, out like a lamb.

The teacher should have students observe and investigate how water becomes rain. This could be done by giving each student a zip-lock bag and 500 mL of water. Students should ensure there is air inside each bag before it is closed. Each student should place their name on their bag and place it in a sunny place. In a day or two, students observe the changes that took place. Students should observe that droplets of water have formed (condensation) and they are dripping down the bag creating "rain". The teacher should compare what happened in their bags to what happens in nature. The students could place their bags in a dark area of the room, then in a day or two observe the changes. The students should compare the sunny area to the dark area.

Observing Local Weather *(continued)*

Tasks for Instruction and/or Assessment

Interview

Teachers could ask students, “During what season would you usually see a particular weather event (snow = winter) and why?”. (100-3, 202-2)

Portfolio

Students should individually record on a calendar the weather for a period of time e.g., weekly, monthly, yearly). (203-2)

Journal

Students could draw a weather picture and provide clues in the pictures – what are people wearing? Do the trees have leaves? Is the sun shining? When finished, they could share with a friend. Students could guess the weather conditions. Next, the teacher could help bind their pictures into a book. (100-3)

Students could draw a picture of what the weather was like when they were outside. The teacher should help students write a brief description of the weather. (100-3)

Students could record in their Journal how they made rain. They could draw pictures and with teacher assistance, write about it. (202-1)

Resources/Notes

My World: Things We Use

(100-3)

TR	Lesson 9	pp. 84-88
	Lesson 10	pp. 89-93

Appendix B: Kindergarten Science Backpack #9

(202-2)

TR	Lesson 9	p. 86
	Lesson 10	p. 91

Appendix B: Kindergarten Science Backpack #9

(203-2)

TR	Lesson 10	p. 90
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(202-1)

TR	Lesson 10	pp. 91-92
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A Look At Soil

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) soil
 - (ii) organic matter/humus (100-1)
- observe various soil samples, using one or a combination of the senses (201-4)
- use personal observations when asked to describe characteristics of soils studied. Include:
 - (i) colour
 - (ii) texture (dampness and composition)
 - (iii) smell (202-1)
- communicate ideas, and predictions while conducting their soil investigations (203-1)
 - predict which soils would be best for plant growth
 - describe the characteristics of the most fertile soil

Elaborations – Strategies for Learning and Teaching

Before beginning a plant study, teachers should increase awareness of which soils would be best for growing plant(s). As students work through the process of determining which factors affect plant growth, they should investigate different types of soil. The Spring of the year could provide the best experience since outside exploration is preferable.

Teachers should have students discuss the following questions and record their answers on chart paper, “What do I know about soil?” “What would I like to learn about soil?” “What kind of soil is best for growing plants?” Some of these questions will be investigated throughout this unit.

Teachers should consider introducing this unit by bringing in a container full of earth to illicit conversation and curiosity about its contents. Teachers could deposit the contents on clear plastic or newspaper and encourage students to use their senses to explore. Teachers could record on a classroom chart the observations under senses headings (see, smell, touch,). Vocabulary may be presented at this time. **Caution: It is advisable to wear gloves when working with soil. Always have students wash their hands after handling soil, plants, or animals.**

Students should explore a variety of soils. Teachers could assist students in recognizing that the material found in soil can be defined as organic and inorganic. Organic materials are alive, while inorganic material is composed mostly of rock that can be broken down to very fine matter. The teacher should note that soil contains decayed animal and plant materials known as humus. Teachers should remind the students that composting is a means of keeping the soil healthy and protecting the environment.

Teachers should bring in various soil samples such as sand, clay, potting soil, compost soil, etc. Students should use magnifying glasses to explore the soils. Teachers should help students sort and label each sample according to such characteristics as colour, smell, texture, dampness and composition. Teachers should facilitate a discussion on how these characteristics would affect plant growth. From this activity, students could draw pictures in their journal that show these characteristics. Students will need time to explore the various samples and predict which soil sample would have the nutrients to grow the healthiest plant (most fertile). Students could plant beans in the various soil samples and observe the outcomes over the next week to confirm or deny their predictions. Teachers should chart students’ observations and record the growth. **Allergy Alert - Some beans are from the ‘nut’ family.**

A Look At Soil

Tasks for Instruction and/or Assessment

Performance

Using a bean plant, and a clear plastic container, students should explore which soil would grow the healthiest plant. Students could chart the results over 2 or 3 weeks. Teachers could assist students in using a digital flex camera to help record the growth. (202-1, 203-1)

Week # 1 Date: _____

Soil Type	Observations	Growth (in cm)	Digital Image
Soil #1			
Soil #2			
Soil #3			

Students could explore soils to determine which soil holds water best. In small groups, the teacher should give each group three paper cups with holes in the bottom of each cup. The students should put a different soil sample in each cup, filling it half way. The students should place each cup in a clear plastic container. The teacher should help them measure 125ml of water and pour it into each cup of soil. The students should observe which soil held the most water and which soil held the least. Students could pour the water that is in the bowl back into the measuring cup to note how much water was left. The teacher could help them record the amount in a chart. (201-4, 203-1)

Teachers could dye various amounts of sand by using powdered tempera paint. Students could create scenes using a glue stick, cardboard and coloured sand. Alternatively, students could glue sand and soil in a creative pattern on cardboard. (202-1)

Students could work with potter's clay, if available, or modeling clay to create a sculpture that can be fired and later painted. This activity would require students to mold and shape the clay using their fingers and water. Access to an artist who could demonstrate this process would be a worthwhile experience for the student. (100-1, 201-4)

Students could become Soil Detectives and walk around the schoolyard to collect soil samples in clear baggies. Once samples have been gathered, students should label the baggies noting the location in which the soil was taken. Once they return to the classroom, students should explore their samples. (203-1)

Journal

Students could record their soil sample in their journal. (202-1)

Resources/Notes

My World: Things We Use

(100-1)

TR Lesson 11 pp. 94-98
SR pp. 6-7

(201-4, 202-1)

TR Lesson 11 p. 96

Appendix B: Kindergarten
Science Backpack #10B

(203-1)

TR Lesson 11 p. 97

Appendix B: Kindergarten
Science Backpack #10A

Introducing Water

Outcomes

Students will be expected to

- develop vocabulary and use language to bring meaning to what is seen and thought. Include:
 - (i) melt
 - (ii) freeze
 - (iii) dissolve (100-1)
- explore the characteristics of water that may change as a result of:
 - (i) adding a solute
 - (ii) freezing
 - (iii) melting
 - (iv) evaporating (101-1)
- observe water samples, using one or a combination of the senses (201-4)
- use personal observations when asked to describe characteristics of water studied (202-1)
- communicate ideas, and predictions while conducting their water investigations (203-1)
 - describe the effect of a temperature change on the amount of evaporation
 - describe the effect of temperature change on the amount of melting/freezing

Elaborations – Strategies for Learning and Teaching

Throughout the year, teachers should provide opportunities for students to investigate properties of water as they explore at a water table or water pans. Students could manipulate water using materials such as plastic containers, plastic bottles, buckets, and spoons. Students should have time to informally investigate with water, to make observations and discoveries on their own, and then contribute ideas for class investigations.

Teachers could share books about water such as *Water* by Susan Canizares and Pamela Chanko. Teachers should facilitate a brainstorming session with students about water and its properties/ characteristics.

When investigating melting, freezing and dissolving, teachers could assist students in dissolving sugar cubes or crystal drink powder, etc. To continue, teachers should freeze the crystal drink solution to make popsicles. Students should observe the melting process as they enjoy their frozen treats. Teachers should ensure that students understand the effect of temperature on freezing and melting.

Teachers should add a copious amount of salt to water and allow it to dissolve. Teachers should help students to note the changes that have occurred in the water as a result of adding the salt. Teachers should allow the water to evaporate over a period of time. Students should observe the residue remaining in the dish.

Students could place equal amounts of snow (in a container) in different areas of the classroom to determine conditions that affect the rate of melting and evaporation. Students should place the snow in at least three different locations in the classroom (e.g., sunny spot, dark spot, near a heat source, etc.) and periodically check for melting and evaporation.

Introducing Water

Tasks for Instruction and/or Assessment

Performance

Teachers could provide students with a frozen treat (water based). While eating the Popsicle, the teacher could discuss such things as, *What happens to the popsicle when you put it in your mouth?* (dissolves) *What happens when the Popsicle melts?* (changes to a liquid) *Why does it melt?* In the discussion, teachers should encourage the use of words such as melts, freezes and dissolves. (100-1)

In small groups, students could perform activities that discover the factors that affect the rate of melting. Teachers could distribute an ice cube in a ziplock bag to each group and ask students to pass it from person to person (allowing each student equal time) to help melt the ice. The group who melts the ice cube first wins the game. Teachers should point out that melting is a change from solid to liquid, i.e., the ice does not “disappear”. (100-1, 101-1, 201-4)

Journal

Students could draw their observations of the processes of dissolving, freezing and melting. (101-1, 202-1)

Informal Observation

During group discussion time and individual conversations, note the types of words and phrases each student is using to describe freezing and melting; sinking and floating. (100-1, 101-1, 201-4)

Resources/Notes

My World: Things We Use

(100-1)
TR Lesson 12 pp. 99-103
SR p. 8

Appendix B: Kindergarten
Science Backpack #11A

(101-1)
TR Lesson 12 pp. 100-102

Appendix B: Kindergarten
Science Backpack #11A

(201-4)
TR Lesson 12 pp. 101-103

(202-1)
TR Lesson 12 pp. 102-103

(203-1)
TR Lesson 12 pp. 101-103

(203-1)
TR Lesson 5 p. 67

Introducing Water *(continued)*

Outcomes

Students will be expected to

- communicate ideas, and predictions while conducting their water investigations (203-1 cont)
 - students will place objects in groups according to whether they will float or sink.
 - investigate the properties of floating and sinking by exploration

Elaborations – Strategies for Learning and Teaching

Teachers should gather collections of objects that float, including containers that float well and some that can float but sink easily when moved or tipped. Students should explore how the containers float, how much of a load each container can carry before sinking and how they can make a container sink.

Students could select objects from the collection and, after predicting what they think will happen, they should test to see which will sink and which will float. They should sort objects based on their sinking and floating predictions and then record their final sort by drawing or making a display of the objects and materials they tested.

To further investigate floating and sinking, students could use various materials such as paper, styrofoam, plastic, leaves, plasticine, and tinfoil to make boats that will float. Students could test their boats to determine which one will hold the greatest load. Students should share what they made and how it worked.

Introducing Water *(continued)*

Tasks for Instruction and/or Assessment

Presentation

Students could complete **Activity 9, *Floating & Sinking*** (**Appendix A**). In this activity, students predict and test the buoyancy of several different objects/materials. They should categorize their objects based on experimental results and present their results to the whole class. (203-1, 202-1)

Pencil and Paper

Students could complete **Activity 10, *I Can Float or Not*** (**Appendix A**). In this activity students experiment to determine the effect of an object's shape on its buoyancy. Students could draw pictures which illustrate containers that float or sink. (203-1, 202-1)

Resources/Notes

My World: Things We Use

(203-1)

TR Lesson 5 p. 67

Activity 9, *Floating & Sinking*, Appendix A

Activity 10, *I Can Float or Not*, Appendix A

Appendix B: Kindergarten
Science Backpack #11B

