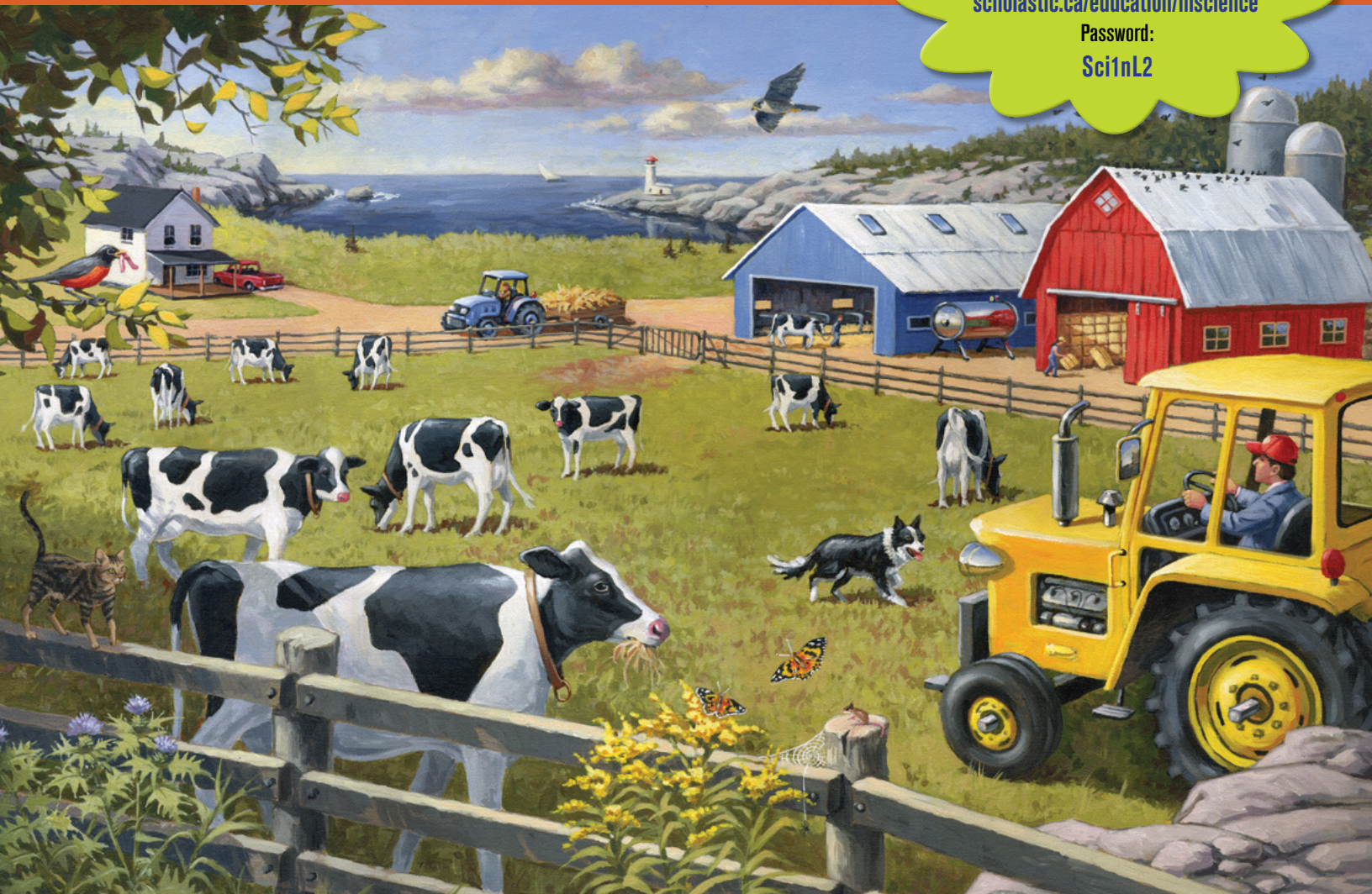


Grade **1**

Needs and Characteristics of Living Things

TEACHER'S GUIDE

Online version
and additional resources
available at
scholastic.ca/education/nlsience
Password:
Sci1nL2



Needs and Characteristics of Living Things

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Let's Do Science, Newfoundland and Labrador

Grade 1 Unit 4: Needs and Characteristics of Living Things Teacher's Guide

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Welcome to the *Needs and Characteristics of Living Things* Unit

In this unit, students develop their understanding of the needs and characteristics of living things through a variety of explorations and investigations. Multiple resource components will engage students and support learning of the specific science concepts.

Science Cards

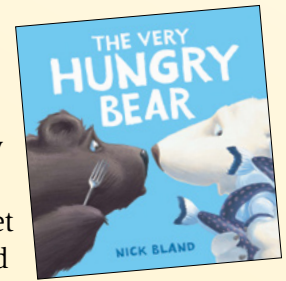
This collection of 10 Science Cards will support students' exploration of the needs and characteristics of living things with each large-format card focusing on a different concept. The bright, colourful photographs and detailed illustrations will engage students and give them multiple opportunities to explore a variety of concepts. These stand-alone cards can also be used at centres to stimulate student explorations. Also, digital versions of these cards are available on the Teacher's Website to be used with an Interactive Whiteboard.



Science Read Alouds



Two Read Aloud texts allow you to introduce and engage students with science concepts. *Ordinary Amos and the Amazing Fish* by Eugenie Fernandes and Henry Fernandes introduces the concept of specific needs by examining what happens when a human is kept as a pet by a family of fish. *The Very Hungry Bear* by Nick Bland introduces the concept of living things depending on their environment to fulfill their needs by sharing the story of a brown bear who tries to help out a polar bear in need of a home.



Anchor Video



The Anchor Video: *Needs and Characteristics of Living Things*, found on the Teacher's Website, introduces students to essential questions about how living things have different physical characteristics but how all living things need food, water, and shelter to survive. The video gives a number of examples to activate students' thinking and to promote questions.

Posters

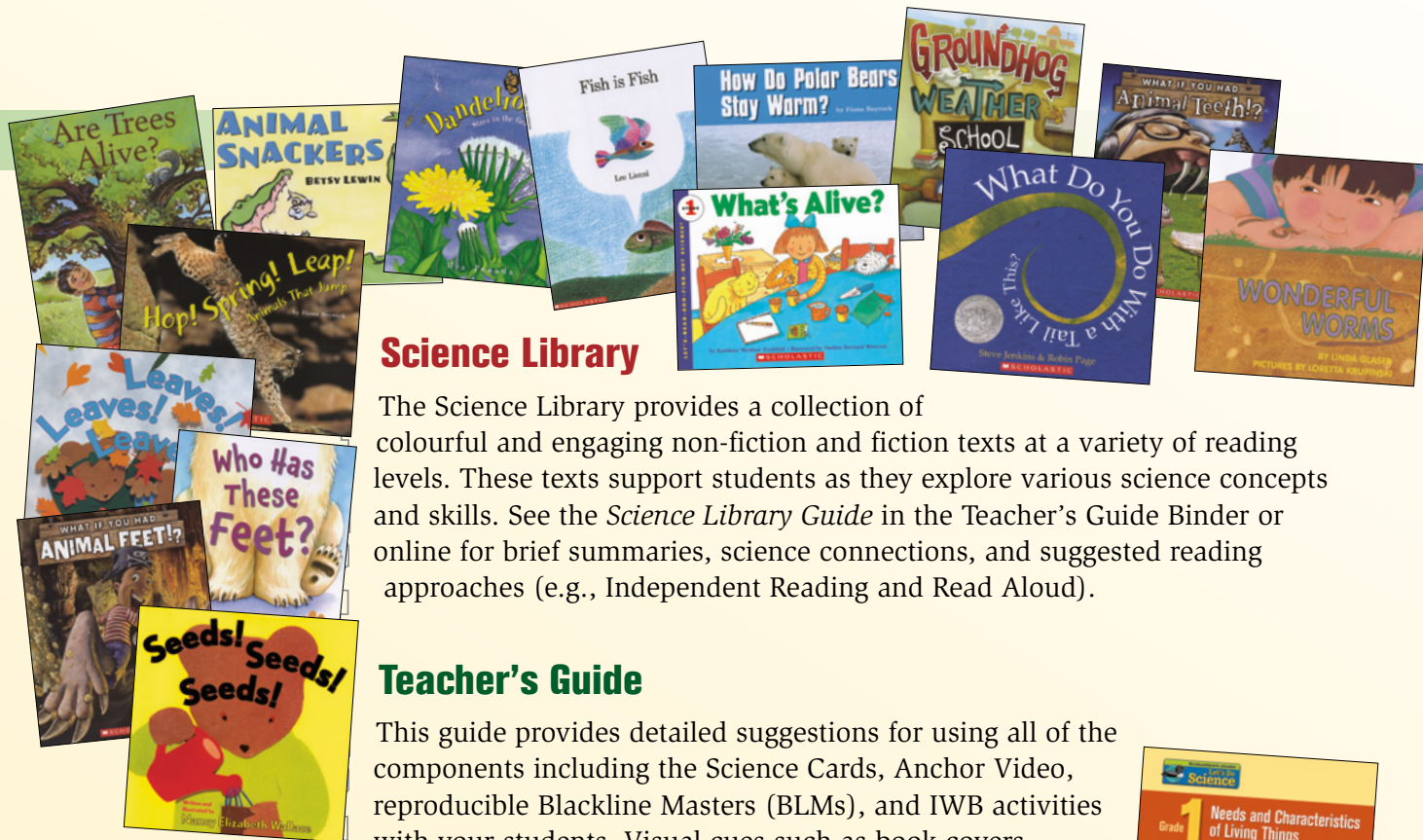
Two classroom posters—*What Is the Inquiry Process?* and *What Is the Design Process?*—will support students as they follow the steps for guided and open inquiries and learn to use the design process to create a solution to a problem.



Interactive Whiteboard Activities

There are 9 interactive activities for the Interactive Whiteboard (IWB) found on the Teacher's Website. These activities provide students with a variety of hands-on learning experiences and the opportunity to apply learning in a supported environment. The IWB Activities are tied to the teaching plans to ensure that the learning is done in context.





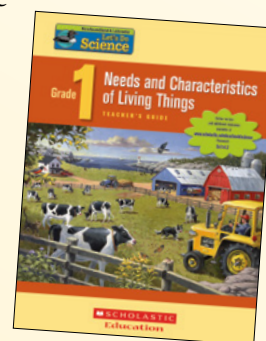
Science Library

The Science Library provides a collection of colourful and engaging non-fiction and fiction texts at a variety of reading levels. These texts support students as they explore various science concepts and skills. See the *Science Library Guide* in the Teacher's Guide Binder or online for brief summaries, science connections, and suggested reading approaches (e.g., Independent Reading and Read Aloud).

Teacher's Guide

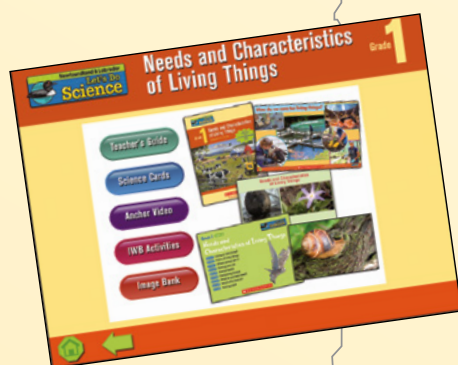
This guide provides detailed suggestions for using all of the components including the Science Cards, Anchor Video, reproducible Blackline Masters (BLMs), and IWB activities with your students. Visual cues such as book covers, thumbnail images, and icons highlight the use of each component along with tools such as Science Folders and Journals, the Word Wall, and the I Wonder Wall. Strategies and tools you need to assess students' learning, such as rubrics and checklists, are also included.

Embedded within the teaching plans are connections to Guided, Shared, and Read Aloud texts from *Literacy Place for the Early Years*, Grade 1 that relate to the concepts explored in *Needs and Characteristics of Living Things*.



Teacher's Website

In addition to the Science Cards, Anchor Video, and IWB Activities mentioned above, the Teacher's Website provides a digital copy of the Teacher's Guide for this unit along with access to an image bank containing the variety of photographic images found on the Science Cards and IWB Activities. These images may be used for teachers to create new IWB activities or for students to incorporate into presentations. Find the Teacher's Website at scholastic.ca/education/nlscience
Password: Sci1nL2



Planning Guide for *Needs and Characteristics of Living Things*

Teaching Plans	Specific Curriculum Outcomes	Components	Materials	Literacy Place Connections
What Are Living Things? Students will develop or reinforce their understanding of the difference between living and non-living things. They will also begin to explore the characteristics of living things.	Skills [GCO 2] • 33.0 • 34.0 • 1.0 • 2.0	- Anchor Video: <i>Needs and Characteristics of Living Things</i> - IWB Activity 1 - Science Card 1 - Unit 1, Science Cards 9 and 10 (optional) - BLM <i>Living Things</i>	- students' Science Journals - construction paper - poster board - markers - glue - scissors - students' Science Folders	<i>Is It Alive?</i> (Guided Reading, Level B) <i>True or False?</i> <i>Finding Out About Newfoundland Dogs</i> (Guided Reading, Level H)
How Do We Describe Living Things? Students will observe a variety of living things and record their observations, focusing on physical characteristics.	Skills [GCO 2] • 7.0 • 3.0	- Science Card 2 - Science Card 3 - IWB Activity 2 - BLM <i>Plant Journal</i> - IWB Activity 3	- materials for mini-centres including photographs of plants and animals, digital images and videos, sample animal coverings, plant parts, books and magazines, whole plants, class pet - fast-growing seeds such as beans - cotton balls - clear containers such as plastic cups OR clear, re-sealable bags and tape - watering cans - students' Science Journals - interlocking cubes - sticky notes - cut-out pictures of living things, one for each student - index cards	<i>Is This a Moose?</i> (Shared Reading–Analyzing Strategy Unit) <i>The Best Pet</i> (Shared Reading–Evaluating Strategy Unit) <i>Plant a Seed</i> (Guided Reading, Level H)
How Can We Group and Sequence Living Things? Students will practise sequencing and grouping living things according to one or more observable physical characteristics.	Skills [GCO 2] • 9.0	- IWB Activity 4 - IWB Activity 5	- index cards (optional) - interlocking cubes - construction paper - scissors - markers or crayons - various beans and seeds in separate clear containers - sunflower seeds - animal figurines - images of different animals, at least one per student	

Teaching Plans	Specific Curriculum Outcomes	Components	Materials	Literacy Place Connections
How Can We Compare Living Things? Students will compare individual humans or other animals of the same species and identify shared and unique characteristics.	STSE/K [GCO 1/3] • 35.0	- Science Card 4 - BLM <i>Comparing Animals: Venn Diagram</i> - BLM <i>Comparing Dogs</i> - IWB Activity 6 - BLM <i>My Unique Face</i>	- photographs, books, and videos showing different individuals from the same species (e.g., books about dogs, a video about horses) - large sheets of black construction paper or poster board - white crayon or chalk	<i>Same and Different</i> (Guided Reading, Level E)
How Can We Model Living Things? Following a design process, students select an animal and design and build a model of that animal that is as accurate as they can make it.	Skills [GCO 2] • 32.0	- Science Card 5 - Unit 2, Science Card 6 (optional) <i>What Is the Design Process?</i> poster - BLM <i>My Animal Model</i> - BLM <i>Animal Model Gallery Walk</i>	- a selection of models of animals such as stuffed toys, plastic figurines, wooden statuettes, and stone carvings - videos and photographs of animals - students' Science Journals - a wide variety of construction materials that might include construction paper, cardboard, newspaper, crayons, markers, paint, scissors, glue, tape, string; craft sticks, pipe cleaners, cardboard tubes, feathers, fun fur, modelling clay, papier mâché, foam balls, cloth - digital camera (optional)	
What Do Living Things Need? Students observe living things through direct experience and visual media, and identify similarities and differences in their specific needs.	STSE/K [GCO 1/3] • 36.0	<i>Ordinary Amos and the Amazing Fish</i> (Read Aloud) - Science Card 6 - Science Cards 2 and 3 (optional) <i>What Is the Inquiry Process?</i> poster - BLM <i>Plant Needs Plan</i> - BLM <i>Plant Needs Results</i> - IWB Activity 7	- plants from the Growing Plants investigation - salt water - vinegar - soil - garden tools - cardboard boxes - scissors - students' Science Folders - students' Science Journals	

Continued on next page...

Planning Guide for *Needs and Characteristics of Living Things* (continued)

Teaching Plans	Specific Curriculum Outcomes	Components	Materials	Literacy Place Connections
How Do Living Things Meet Their Needs? Students will explore how living things meet their needs for food, water, and shelter. In particular, they will explore how humans and other animals, as well as plants, move to meet their needs.	Skills [GCO 2] • 10.0 STSE/K [GCO 1/3] • 37.0 • 38.0 • 40.0	• Science Card 7 • Science Cards 2 and 3 (optional)	• cardboard box with hole cut in it • students' Science Journals • index cards	<i>Move Like the Animals</i> (Shared e-Reading) <i>Whose Teeth Are These?</i> (Read Aloud-Predicting Strategy Unit)
How Do We Use and Care for Living Things? Students describe ways that humans use their knowledge of plants and animals to meet our own needs. Students also describe how humans use their knowledge to meet the needs of plants and animals in their care.	STSE/K [GCO 1/3] • 39.0	• Science Card 8 • IWB Activity 8 • Science Card 9 • Science Card 1 (optional)	• variety of items made of natural materials • poster board • craft supplies	<i>School Days</i> ("Caring for Speedy" pages 14–16, Shared Reading–Active Learning Kit)
How Can We Contribute to a Healthy Environment? Students recognize that living things depend on their environment to fulfill their needs. Students identify simple actions they can do to help maintain a natural environment.	STSE/K [GCO 1/3] • 40.0	• <i>The Very Hungry Bear</i> (Read Aloud) • Science Card 10 • IWB Activity 9	• print or video news stories about animals found in unexpected places due to loss of habitat • large scrapbook or binder to make class book of Focus Animals • construction paper • markers and/or crayons and/or paint • scissors • glue	<i>The Bug Hotel</i> (Shared Reading–Synthesizing Strategy Unit) <i>How to be an Eco Class</i> (Shared Reading–I Can Make a Difference Inquiry Unit)

Preparing for the Unit

1. Curiosity Centre

The Curiosity Centre gives students an opportunity to investigate science ideas and tools through active participation, free exploration, and independent play. In this hands-on centre, students can explore items related to the needs and characteristics of living things.

The Curiosity Centre could have

- living things such as plants (houseplants, cacti) and animals (class pet such as a gerbil or lizard; ant farm; vermiculture—composting using live earthworms; aquaria; betta fish; terrarium)
- realistic models of living things, such as plastic animal figurines
- materials or objects that come from, or are related to, living things and their activities, such as fur, leather, wood, wicker, bone, shells, a piece of a wasp nest, a bird's nest, eggshells, wool, cotton
- books, magazines, photographs, and other sources of text and images related to living things
- videos of living things loaded onto a tablet

Check the centre frequently to ensure it is well stocked with items. Invite students to contribute to the centre by bringing in items or photographs related to living things; if any students self-identify as Aboriginal, ask them to bring items in these categories that are related to their culture. Remind students to tidy up the materials when they are finished.

Note: You may choose to display new items every few days or introduce items one at a time throughout the unit.

2. Science Journals and Folders



Continue to encourage students to add new questions or ideas to their Journals as often as they like. Students can also record their findings and what they learned during investigations.

Remind students that they should store their Science Journals along with completed BLMs, drawings, stories, etc. related to the unit in their Science Folders.

3. Word Wall



Add any relevant science terminology to the Word Wall throughout the unit. Urge students to use the terms as often as possible as they work through the unit.

4. I Wonder Wall



Continue to build the I Wonder Wall throughout the unit by posting students' questions as they arise. Refer to the I Wonder Wall often and select questions that students may be ready to answer.

5. Reading Centre

Add texts (books, magazines, and photographs) relating to the needs and characteristics of living things to the Reading Centre. The titles in the Science Library will help start off a collection of books. Also refer to the lists of texts in the Additional Resources section of this guide (pages 82–83).

What Are Living Things?



Focus: Students will develop or reinforce their understanding of the difference between living and non-living things. They will identify a variety of sources of science information and use them to begin to explore the characteristics of living things.

Specific Curriculum Outcomes

Students will be expected to:

- 33.0 use a variety of sources of science information [GCO 2]
- 34.0 respond to the ideas and actions of others in constructing their own understanding [GCO 2]
- 1.0 pose questions that lead to exploration and investigation [GCO 2]
- 2.0 pose new questions that arise from what was learned [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- identify living and non-living things
- generate and record questions about living things
- use appropriate sources of information to find answers to their questions
- communicate something they have learned about a living thing and the source (e.g., guest speaker, peer, image, book, field trip) of what they learned

NOTES:

Attitude Outcome Statements

Encourage students to:

- be open minded in their explorations [GCO 4]
- show interest in and curiosity about objects and events within the immediate environment [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Anchor Video: <i>Needs and Characteristics of Living Things</i> • IWB Activity 1 • Science Card 1 • Unit 1, Science Cards 9 and 10 (optional) • BLM <i>Living Things</i> Literacy Place: • <i>Is It Alive?</i> (Guided Reading, Level B) • <i>True or False? Finding Out About Newfoundland Dogs</i> (Guided Reading, Level H)	• students' Science Journals • construction paper • poster board • markers • glue • scissors • students' Science Folders	• Display a KWHL chart.	• living things • non-living things

Safety

- Review school safety rules before students go outside for an investigation.

Science Background

- Living things move, respond to stimuli, reproduce and grow, respire, and are dependent on their environment. Most living things need food, water, light, temperatures within defined limits, and oxygen.
- Non-living things are all the things that are not classified as living things. Some non-living things, such as rocks and water, were never living. Once a living thing has died, it becomes a non-living thing. Non-living things may do some of the things that living things do. For example, a car moves, and so does a river. A tablet computer responds to the stimulus of touch.

Possible Misconceptions

- Some students may believe that machines such as cars are living things because they can move. Explain that although cars and other machines can move, they do not grow or reproduce. They are therefore not living things. (Students may also believe that phenomena such as fire, lightning, or clouds are alive because they move.)
- Many students are able to identify constructed items as non-living but fail to identify natural things such as water, air, rocks, and soil as non-living things. Help students notice and identify natural items and ask whether each is living or non-living.
- Students may have difficulty deciding whether materials made from living things, such as wood, are living or non-living. Explain that although wood comes from a living thing (a tree), it is no longer living.
- Students may believe plants are non-living because they “do not move.” Show time-lapse videos to help students see that plants do move, but most of the time we don’t see their movement. (Students will observe plant movement later in the unit.)

ACTIVATE

Anchor Video



Play the Anchor Video: *Needs and Characteristics of Living Things* which is located on the Teacher’s Website. Set a focus for viewing by asking students to look for different kinds of living things. What kinds of living things did they see? You may choose to pause the video to allow students to answer questions or to discuss any questions they may have.

Neighbourhood Walk

Take students on a neighbourhood walk outdoors. As you walk, have students identify living and non-living things. Also have students watch for evidence of living things, such as spider webs, a bird’s nest, tracks, or even dog feces on the sidewalk or roadside. Ask questions during the walk, such as:

- What living things can you see?
- What evidence of living things can you see?
- What non-living things can you see?
- How do you tell living things from non-living things?

After the walk, have students draw in their Science Journals three living things they saw and three things that were not living.

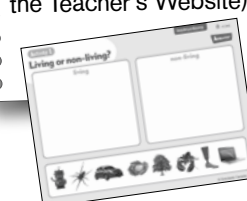
Make a T-chart with the headings “Living” and “Non-living” and list students’ suggestions for each column according to what they identified on their walk.

Use a shared think-aloud to model the generation of questions about living things. Using students’ answers and questions, start a KWHL chart about living things. Refer to it often to allow students to add information and any new questions.



IWB Activity:

- Students can use
- Activity 1: *Living or non-living?* to sort the
- images of living and
- non-living things (see
- the Teacher’s Website).





Identifying Living and Non-living Things

Have students examine the farm scene on Science Card 1 and identify living and non-living things that they see. Ask:

- What living things can you see?
- What evidence of living things can you see?
- What non-living things can you see?
- How do you tell living things from non-living things?



Note that Science Cards 9 and 10 from Unit 1 also depict a variety of living and non-living things and can be used for this activity.

Encourage students to generate questions about the living things depicted on the science card(s). Use the I Wonder Wall to record students' questions.



Literacy Place Connection:

Is It Alive? (Guided Reading, Level B) compares living and non-living things. Invite students to discuss how they know which things are alive and which are not alive.

CONNECT

Brainstorming Session

As a class, brainstorm sources of science information about living things. Examples might include:

- Internet sites
- personal experience
- videos
- images
- texts such as non-fiction books, field guides, encyclopedia, magazine articles
- people (i.e., knowledgeable community members)
- museums and interpretation centres

Then, brainstorm lists of local plants and animals. Include pets, farm animals, and local wild animals.

Focus Animal

Using the brainstormed lists from the previous activity, have each student choose one local animal (farm, domestic, or wild) to focus on throughout the unit. Ask students to begin to write what they know and to generate questions about that animal. They can write these questions in their Science Journals. Throughout the unit, students will gather information about their Focus Animal. Later, they will have the opportunity to create their own page or pages about this animal to contribute to a class book.



CONSOLIDATE

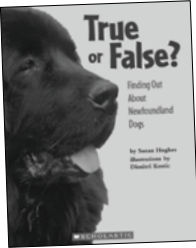


Research Living Things

Students work independently or in small groups to explore sources of science information (e.g., the Internet, personal observation, videos and images, classroom books) to begin to answer their questions about living things in general, as recorded on the I Wonder Wall and the KWLH chart, and about their Focus Animal. They should continue to record new questions that arise.

Poster

Provide poster board and craft supplies. Have students work in pairs or small groups to create posters communicating something they have learned about living things. Alternatively, students could create digital versions using photos from the Image Bank (see the Teacher's Website).



Literacy Place Connection:

True or False? Finding Out About Newfoundland Dogs (Guided Reading, Level H) invites the reader to learn about the characteristics of Newfoundland dogs by answering a series of true or false questions. Challenge students to answer the questions.



What a Living Thing Is (and Isn't)

Provide students with copies of BLM *Living Things*. Have students complete the BLM to consolidate their understanding of characteristics of living things. Invite students to share their work with a partner. Then invite volunteers to share with the class. Remind students to store the completed BLMs in their Science Folders.

EXPLORE MORE

Interviewing an Expert

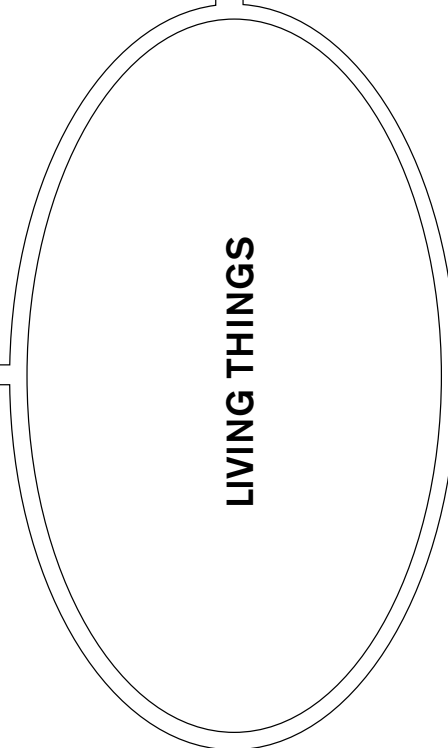
Challenge students to interview an adult they know (e.g., a parent, a dog groomer, a community Elder, or a farmer) to find answers to questions they have about living things. Students can then present their findings orally to the class. Alternatively, they could digitally record the interview using a smart phone.

Living Things

Name: _____

Pictures or drawings of living things

Characteristics of living things



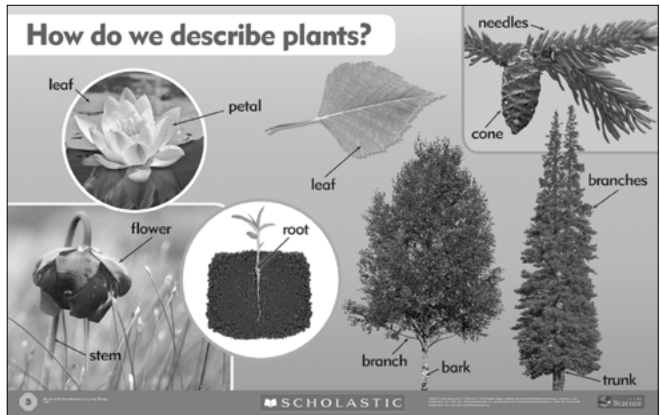
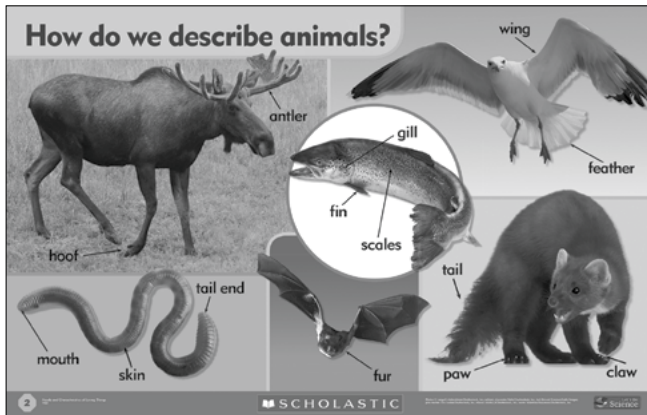
LIVING THINGS

Things that are living

Things that are not living

Adapted from Frayer Model Diagram

How Do We Describe Living Things?



Focus: Students will observe a variety of living things and record their observations, focusing on physical characteristics.

Specific Curriculum Outcomes

Students will be expected to:

- 7.0 make and record observations and measurements [GCO 2]
- 3.0 communicate using scientific terminology [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- use appropriate vocabulary to describe a familiar living thing orally
- record observations about a living thing using words and images

NOTES:

Attitude Outcome Statements

Encourage students to:

- recognize the role and contribution of science in their understanding of the world [GCO 4]
- willingly observe, question, and explore [GCO 4]

Cross-Curricular Connections

Math

It is expected that students will:

- demonstrate an understanding of measurement as a process of comparing (by matching) [1SS1]

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]
- respond personally to a range of texts [GCO 6]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 2 • Science Card 3 • IWB Activity 2 • BLM <i>Plant Journal</i> • IWB Activity 3 Literacy Place: • <i>Is This a Moose?</i> (Shared Reading–Analyzing Strategy Unit) • <i>The Best Pet</i> (Shared Reading–Evaluating Strategy Unit) • <i>Plant a Seed</i> (Guided Reading, Level H)	• materials for mini-centres including photographs of plants and animals, digital images and videos, sample animal coverings, plant parts, books and magazines, whole plants, class pet • fast-growing seeds such as beans • cotton balls • clear containers such as plastic cups OR clear, re-sealable bags and tape • watering cans • students' Science Journals • interlocking cubes • sticky notes • cut-out pictures of living things, one for each student • index cards	• Invite an Elder to come and speak to the class about making observations when living on the land. • A week or more in advance test a few of the seeds you plan to use for the Growing Plants activity to ensure they will grow quickly and reliably. • The day before the Growing Plants activity, you may want to soak tough seeds such as corn, peas, or beans overnight to reduce germination time. • Record names of local living things on index cards.	• eye • bark • beak • branch • bud • cone • feather • fin • flower • fur • leaf • leg • mouth • needle • scales • seed • shell • skin • tail • teeth • trunk • wing

Safety

- Discuss safety procedures including washing hands after handling a class pet.

Science Background

- Observations are pieces of information about the world that we collect using our senses or using scientific tools and instruments.
- Making and recording observations are skills central to science. Many scientific processes begin with observations. Here are some examples of observation in action:
 - An ornithologist studying sparrows would be able to use his or her observations and a detailed knowledge of physical characteristics to distinguish between two similar but distinct species.
 - Doctors and veterinarians observe their patients to look for symptoms that will help them make a diagnosis.
 - People who gather wild plants or mushrooms to eat or use in traditional medicines also rely on the skill of observation to be sure they are collecting the correct species.
 - Aboriginal peoples can use their observation skills to identify safe and sheltered places to set up camp or places where animals gather, making them easier to hunt.
 - Charles Darwin made detailed observations about the different species of the Galapagos finches and other animals he studied on his travels and at home to develop his idea that some differences may improve the chances of survival and reproduction of a particular individual.

Possible Misconceptions

- Students may have difficulty distinguishing between physical characteristics that they can observe (this animal has wings) and inferences they can make based on background knowledge and what they observe (this animal can fly; this animal is a bird).

Use Science Card 2 to help students understand the difference. For example, an observation about the pine marten might be that it has sharp teeth and claws. An inference that you could make based on this observation is that it catches and eats other animals. It can be helpful to show that inferences are not necessarily correct. For example, consider the bat. It has wings, so you might infer that it is a bird, but it is not; it is a mammal. Similarly, an ostrich or a chicken has wings, so you might infer that it can fly, but it cannot.



ACTIVATE

Guess-the-Student Game

Choose a student in the classroom but do not tell the class whom you have chosen. Describe the student using observable characteristics (e.g., hair

colour and length, clothing type and colour), and have students infer which student you are describing. Draw out the difference between observable physical characteristics and other characteristics, such as personality traits, name, or favourite TV show.

Guess-the-Living Thing Game

Use observable physical characteristics to describe a familiar animal, such as a dog, cat, mouse, or goldfish. Use characteristics such as size, body covering, colour, type and number of limbs (legs, tail, fins, etc.). Have students infer what living thing you are describing. Focus on physical characteristics that can be observed rather than other features of the animal, such as diet, habitat, or behaviour. Begin adding terms describing physical characteristics to the Word Wall.



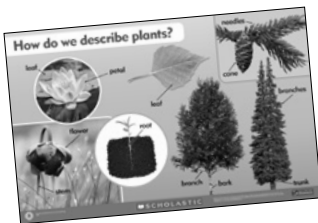
CONNECT



Describing Plants and Animals

Display Science Card 2. Read the title question: *How do we describe animals?* Then invite students to describe what they observe for each animal. The local animals depicted are a moose, a seagull, an Atlantic salmon, a pine marten, a little brown bat, and an earthworm. Draw out observations by asking questions such as:

- Which animals have fur?
- What other kinds of body coverings do you see?
- How many legs does each animal have?
- Which animals have wings?
- How would you describe the feet of the pine marten? the moose? the seagull?
- Which animal (or animals) has a beak? fins? gills? a tail?
- What body parts do all of the animals have in common?



Repeat the activity with Science Card 3. The local plants depicted are a water lily, a pitcher plant, a birch tree, and a black spruce tree. Draw out observations by asking questions such as:

- Which plants have leaves? Which plant has needles?
- Which plants are the biggest? Which are the smallest? How do you know?
- How would you describe the flowers of the pitcher plant? of the water lily?
- What colours do you see on each plant?
- Do all of the plants have roots? What do roots do?

As you discuss the photographs on Science Cards 2 and 3, add new terms to the Word Wall that will help students describe the physical characteristics of animals and plants, such as body parts of animals and names for parts of plants.



Observing Living Things

Set up plant and animal mini-centres to enable students to practise observing and describing living things using words and pictures.

- Cut out photographs of a variety of plants and animals—consider mounting them on cardboard or laminating for durability.
- Collect digital images and videos of living things on a tablet for students to view.
- If possible, bring in examples of animal coverings, such as fur, feathers, and snakeskin so that students can use their sense of touch to make observations.
- If possible, bring in examples of different plant parts, such as several examples of tree bark, leaves, evergreen needles, flowers, and buds.
- Provide books or magazines that have photographs of various living things.
- Display any class plants or bring in some plants (e.g., a cactus, a spider plant).
- If you have a class pet, bring it into the Curiosity Centre for observation, if possible.

Encourage students to think about questions they have as they practise observing and describing living things at the plant and animal mini-centres. These questions can be recorded on sticky notes and attached to the I Wonder Wall.



IWB Activity:

- Students can use
- Activity 2: *Parts of living things* to identify
- and label parts of trees
- and animals (see the
- Teacher's Website).



Literacy Place Connection:

In *Is This a Moose?* by Jenny Armstrong, students are exposed to a variety of different Canadian animals and their identifying features. In *The Best Pet* by Tony Stead, a class comes up with imaginary pets that combine physical characteristics of two different animals. Revisit or read these texts with students and provide prompts for discussion, such as:

- What kinds of body coverings do you see?
- What body parts do any of the animals have in common?
- What body parts are different

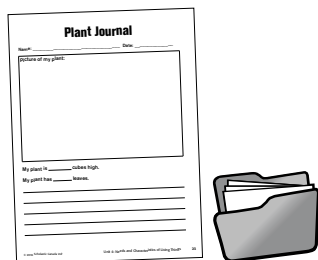


Observing on the Land

Invite an Elder to speak to the students on the types of observations that people make when out on the land, in order to identify good camping spots or fishing sites, for example. Relate these observations back to scientific observation and discuss the similarities and differences.

Growing Plants

Provide cotton balls, beans (or other quick-growing seeds), and identical clear containers (e.g., glass jam jars, plastic cups) to students. Have students label their containers. (As a space-saving alternative to jars or cups, consider



germinating the seeds in clear, re-sealable bags taped to the classroom window.)

Each student should fill a container about 2/3 full with cotton balls. Next, they should place a seed in the jar about half way down in among the cotton. The seeds should be against the wall of the container for easier observation. Finally, students should carefully add water to the container so that their cotton balls become damp but not soaked.

Grow two or three extra plants in case a student's seed does not germinate, and for later use (see Note below).

Using their Science Journals or copies of BLM *Plant Journal*, students can record their observations of their growing plants every two to three days using words or sentences, and sketches. Encourage students to use interlocking cubes to measure and record the height of their plants.

You may choose to set up a graph for the class to record the growth of their plants. You could use sticky notes: each sticky note could represent one cube of growth. Or, draw plants on large graph paper, one for each student. Students can colour in the plant to a height that represents their own plant. (E.g., one graph line represents one cube.)

Remind students to keep their plants healthy and growing by watering consistently to ensure the cotton balls remain damp but not soaked.

Note: Grow all plants using the same method, since they will be used in a controlled experiment later in the unit.



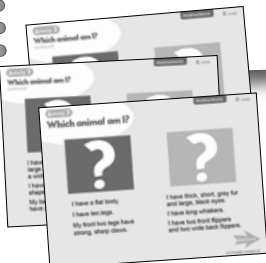
Literacy Place Connection:

Plant a Seed (Guided Reading, Level H) explains how students can grow radishes from seeds.

CONSOLIDATE

IWB Activity:

- Invite students to read the descriptions of animals, predict the animal, then check their predictions using
- Activity 3: *Which animal am I?* (see the Teacher's Website).



What Am I?

Tape pictures of living things to students' backs or attach them to construction paper headbands. Have students walk around the classroom, asking questions with yes or no answers (e.g., Am I green? Do I have fur?) to identify what plant or animal they "are."

Describing Living Things

Provide index cards with the names of familiar, local living things. Students should take turns picking an index card and then describing the observable physical characteristics of the living thing on the card in such a way that other students can guess what they are describing. This activity can be done in the context of a game such as 20 questions (students should ask questions about physical characteristics only) or a drawing game, in which the describing student makes a sketch of the animal or plant.



Focus Animal

Have students write a description and make a sketch of their focus animal in their Science Journals. In small groups, students can use verbal description and visual aids such as photographs to describe their focus animals to one another.

EXPLORE MORE

Plant Growth Video

Students may use the time-lapse feature on a smartphone or tablet to create a stop-motion video of their growing plant.

Narration

Students may choose a video clip or digital image of a living thing and record narration in which they describe its physical characteristics.

Plant Journal

Name: _____ Date: _____

Picture of my plant:

My plant is _____ cubes high.

My plant has _____ leaves.



How Can We Group and Sequence Living Things?

Focus: Students will practise sequencing and grouping living things according to one or more observable physical characteristics.

Specific Curriculum Outcomes

Students will be expected to:

- 9.0 sequence or group materials and objects
[GCO 2]

Performance Indicators

Students will be expected to:

- infer a rule that has been used to group or sequence students or other living things
- use a rule to group or sequence themselves, objects relating to living things, or living things as represented by images, according to observable physical characteristics

NOTES:

Attitude Outcome Statements

Encourage students to:

- appreciate the importance of accuracy [GCO 4]
- work with others in exploring and investigating [GCO 4]

Cross-Curricular Connections

Math

It is expected that students will:

- demonstrate an understanding of measurement as a process of comparing (identifying attributes that can be compared; ordering objects) [1SS1]

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• IWB Activity 4 • IWB Activity 5	• index cards (optional) • interlocking cubes • construction paper • scissors • markers or crayons • various beans and seeds in separate clear containers • sunflower seeds • animal figurines • images of different animals, at least one per student	• Set up mini-centres with various images of animals as well as beans and seeds for sequencing and grouping. • Prepare index cards with sorting and grouping rules for students. • Locate an online video showing egg-sorting machines at work. (See Additional Resources on page 83.)	• group • height • length • sequence • size

Science Background

- People have been coming up with ways to classify the various forms of life according to their observable physical characteristics for thousands of years.
- Today, in biology, living things are grouped according to a system of classification consisting of eight major levels, or taxa. These levels, in order of increasing specificity, are domain, kingdom, phylum, class, order, family, genus, and species.
- In the five-kingdom system, all plants belong to one kingdom (Plantae) while all animals belong to another (Animalia). Fungi, protists, and

monera make up the other three. (Protists and monera are organisms consisting of one cell only.)

- Each kingdom is then further subdivided. Modern scientists classify with the help of microscopic and DNA evidence along with evidence observable with the unaided eye.

Possible Misconceptions

- Students may become confused about the difference between sequencing and grouping, and in which situations each is appropriate. Help students by giving examples of characteristics that can be sequenced and characteristics that can be grouped, such as the following:
 - Sequencing is appropriate for a measurable feature or characteristic with a range of possible values, such as size, length, or height that can be placed in a logical order (e.g., smallest to largest).
 - Grouping is appropriate for a feature or characteristic with a finite number of defined attributes, such as body covering type (fur, feathers, scales, or skin). It would not make sense to sequence animals based on body covering since there is no logical order that can be imposed based on that feature.

Discuss with students characteristics that could be either grouped or sequenced, such as number of legs (none, two, four, eight, etc.).

ACTIVATE

Grouping and Sequencing Students

Ahead of time, choose several rules by which you can group or sequence students. Be sure to choose characteristics that students can observe directly. Examples of rules might include:

Grouping rules

- hair colour (blonde, black, brown or red)
- male or female
- glasses or no glasses
- wearing jeans, a skirt, or something else (3 groups)

Sequencing rules

- height (shortest to tallest)
- shoe (foot) size (smallest to biggest)
- hair length (longest to shortest)

Choose five to ten students to come to the front of the class. Without telling the class what you are doing, sort them into groups according to your chosen rule. Have the students try to figure out the rule. Encourage them to share their reasoning out loud.

Have those students sit down. Choose another five to ten students. Sort them into a sequence according to a new rule and have the students try to figure out the sequencing rule. Encourage them to share their reasoning.

CONNECT

Self-Grouping and Self-Sequencing

Have students work in groups to come up with rules to group or sequence themselves based on various observable characteristics such as height, shoe size, glasses or no glasses, hair length, etc. (Alternatively, provide rules on index card and have students draw a rule at random.) Once they have completed their grouping or sequencing, have them call you over to infer the rule they used.

Provide construction paper, crayons or markers, and scissors. Students can work in pairs tracing each other's foot and then sequence the cut-outs in order of length. Consider providing interlocking cubes so that students can measure the length and write the measurement on their cut-out. Display the finished cut-outs on the wall in sequence.

Grouping and Sequencing Living Things

In mini-centres, provide objects that students can group and sequence such as the following:

- beans and seeds in small, clear containers (sequence by size)
- sunflower seeds (group by number of stripes on seeds)
- cut-out pictures of animals and/or animal figurines (group based on body coverings or number of legs; sequence based on size of animal represented)

Students may even sequence the plants they are growing and observing according to their height, or group them according to number of leaves. (See the Growing Plants investigation in the How Do We Describe Living Things? teaching plan on pages 20–21.)

CONSOLIDATE

Kinesthetic Grouping and Sequencing

Provide each student with an image of a different animal. Call out sequencing or grouping rules and have students move to sort themselves according to each rule. (Students could use their Focus Animal for this activity.) Examples of rules to use:

- sequencing: smallest animal to biggest animal
- sequencing: longest tail to shortest tail
- grouping: number of legs
- grouping: type of body covering (fur, scales, feathers, etc.)

IWB Activity:

- Invite students to sort animals according to physical characteristics using Activity 4: *Sorting animals* (see the Teacher's Website).



IWB Activity:

- Students can use Activity 5: *Sequencing animal tracks* to sequence tracks by size and then identify the animal that made each track (see the Teacher's Website).



Independent Grouping and Sequencing

Have students choose materials from the mini-centres for the Grouping and Sequencing Living Things activity on page 27, and make a collage to illustrate a grouping or sorting rule. For example, they could create a collage using sunflower seeds grouped according to number of stripes, or a collage showing beans and seeds sequenced according to size.

EXPLORE MORE



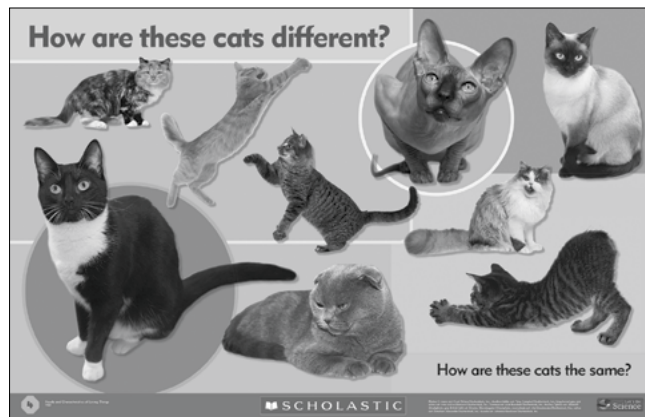
Sorting Eggs

Have students investigate how eggs are sorted by size before being sold to the public. Videos are available for viewing online that show egg-sorting machines at work. After viewing one of these videos, have students ask and record questions they have about the process on the I Wonder Wall. Prompt students by asking questions such as:

- **How does the sorting machine work?**
- **Why are eggs sorted by size before being sold?**
- **Why are some eggs discarded?**
- **Why are the eggs different sizes if they all come from the same type of animal?**

Students can conduct further research to try to answer their questions.

How Can We Compare Living Things?



Focus: Students will compare individual humans or other animals of the same species and identify shared and unique characteristics.

Specific Curriculum Outcomes

Students will be expected to:

- 35.0 identify and describe common characteristics of humans and other animals, and identify variations that make each person and animal unique [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- identify and describe characteristics shared by all humans and characteristics that make individual humans unique
- view a collection of images of animals of the same species (such as dogs) and identify and describe characteristics that are common to all of that species and characteristics that are unique to an individual of the species.

NOTES:

Attitude Outcome Statements

Encourage students to:

- show interest in and curiosity about objects and events within the immediate environment [GCO 4]
- be sensitive to the needs of other people, other living things, and the local environment [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]
- select, read, and view with understanding a range of literature, information, media, and visual text [GCO 4]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 4 • BLM <i>Comparing Animals: Venn Diagram</i> • BLM <i>Comparing Dogs</i> • IWB Activity 6 • BLM <i>My Unique Face</i> Literacy Place: • <i>Same and Different</i> (Guided Reading, Level E)	• photographs, books, and videos showing different individuals from the same species (e.g., books about dogs, a video about horses) • large sheets of black construction paper or poster board • white crayon or chalk	• If desired, invite a farmer, or a breeder of dogs or other animals, to come to class to talk to the students about how different breeds of the same animal compare, and how individuals within a breed compare.	• shared characteristic • unique characteristic

Science Background

- In biology, a species is a group of organisms with similar physical characteristics that normally interbreed only among themselves.
- To check whether two animals you want to compare are of the same species, search for their Latin, or formal name. The formal name for a species consists of the genus name and then the species name itself. The genus name is always capitalized and the species name is always lowercased. Both are written in italics. This system of naming is called binomial nomenclature. For example, all humans belong to the species *Homo sapiens*. “*Homo*” identifies the genus; “*sapiens*” identifies the species. Here are a few other examples:

- Woodland caribou: *Rangifer tarandus*
- Wolverine: *Gulo gulo*
- Common loon: *Gavia immer*
- Red-throated loon: *Gavia stellata*
- Subspecies can be designated using a third latin term. For example, the grey wolf is *Canis lupus lupus*, while the domesticated dog is *Canis lupus familiaris*.
- Humans establish different breeds of domesticated animals of the same species such as horses, cows, dogs, and cats by choosing which individuals can mate. Breeders choose desirable physical or behavioural traits, such as good milk production in cows, or friendliness in dogs, and mate animals with those traits. A distinct breed develops, with individuals that tend to share characteristics. For example, Newfoundland ponies are sturdy and strong, while Thoroughbred horses have long legs and can run very fast.

ACTIVATE

Comparing Animals

Initiate a discussion with the class and invite students to compare and contrast similar animals. Allow comparisons of animals from different species such as a fox with a dog, or an ostrich with a hummingbird. Ask:

- How are these animals the same?
- How are they different?



Literacy Place Connection:

Same and Different (Guided Reading, Level E) compares the observable physical characteristics of a girl and her puppy. Invite students to choose another animal and tell how they are the same and how they are different from that animal.

Comparing Ourselves

Play comparing games such as the two described below to let students practise noticing similarities and differences among people's observable physical characteristics. Sensitivity is required here: avoid highlighting characteristics that might make students feel uncomfortable or singled out, such as weight.

You're Like Me!

Have students take turns observing physical characteristics that they share with other students. For example, Steven could say, "I have two eyes and so does Mayim." Mayim could then say, "I have freckles and so does Callum," and so on. To make the game more challenging, students should repeat the physical characteristics said by each student before them and then add a new observation.

Stand Up If...

Have students all sit down. Then call out observable physical characteristics. Students who exhibit those characteristics should stand up. After the first turn, students who do not exhibit the next characteristic called out should sit down. Include some silly ones for fun. Here are some examples:

- Stand up if you have blue eyes.
- Stand up if you have long hair.
- Stand up if you have brown hair.
- Stand up if you have curly hair.
- Stand up if you have purple hair.
- Stand up if you have two legs.
- Stand up if you have eight tentacles.

After playing the games, post the words “unique” and “shared” on the Word Wall. Ask students:



- **What does “unique” mean?**
- **What characteristics make individual humans unique?**
- **What does “shared” mean?**
- **What characteristics do all humans share?**

Encourage students to ask questions after playing the games and record their questions on the I Wonder Wall.

CONNECT



Comparing Cats

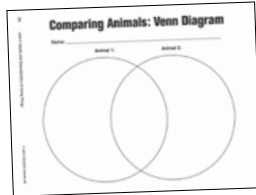
With the class, or in smaller groups, show students Science Card 4. (Clockwise from top left: calico cat, marmalade cat, short-haired tabby cat, hairless Sphinx cat, Siamese cat, long-haired cat, Manx cat, British fold cat, tuxedo cat) Model a comparison by choosing two cats and describing a few ways in which they look different and a few ways in which they look the same. Then choose two different cats and ask:

- **How are these cats different?**
- **How are they the same?**

On chart paper or the IWB, model the use of a Venn diagram to compare two of the cats.

Collaborative Comparing

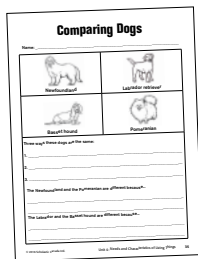
Set up two or three mini-centres for students to practise comparing animals of the same species. Collect pictures, books, and digital resources showing different animals of the same species. For example, you could have centres for two or three of the following animals for students to discuss and compare:



- goldfish
- ducks
- wolves
- horses
- cows

Have each student choose two different images showing different individuals of the same species (or one image that includes two or more different animals of the same species). In pairs or small groups, students can describe the similarities and differences between their animals. They can then use BLM *Comparing Animals: Venn Diagram* to compare their animals.

CONSOLIDATE



Independent Comparing

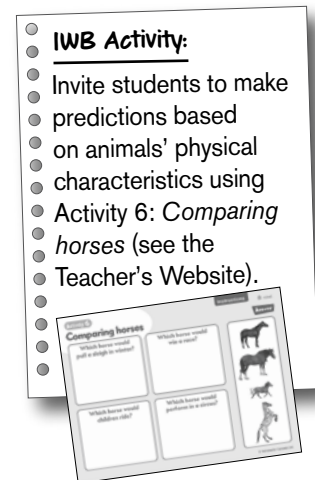
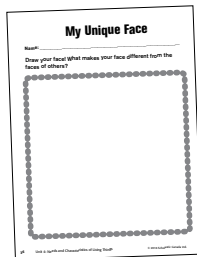
Provide copies of BLM *Comparing Dogs* and have students point out similarities and differences in animals of the same species.

Profile Silhouettes

Create profile silhouettes of students' heads on black construction paper using white crayon or chalk. Mix up the drawings and then hold them up. Ask:

- Who do you think this is?
- What do you see on the silhouette that tells you that?

Have students use BLM *My Unique Face* to draw a picture of their face and identify some features that distinguish them from others.



EXPLORE MORE

Research Human Variation

Provide books at the Reading Centre that allow students to investigate variations in genetic traits among humans, such as left or right dominant hand, ability to roll the tongue, ear lobe attachment, and hair line shape.

Research Differences in Breeds of Domestic Animals

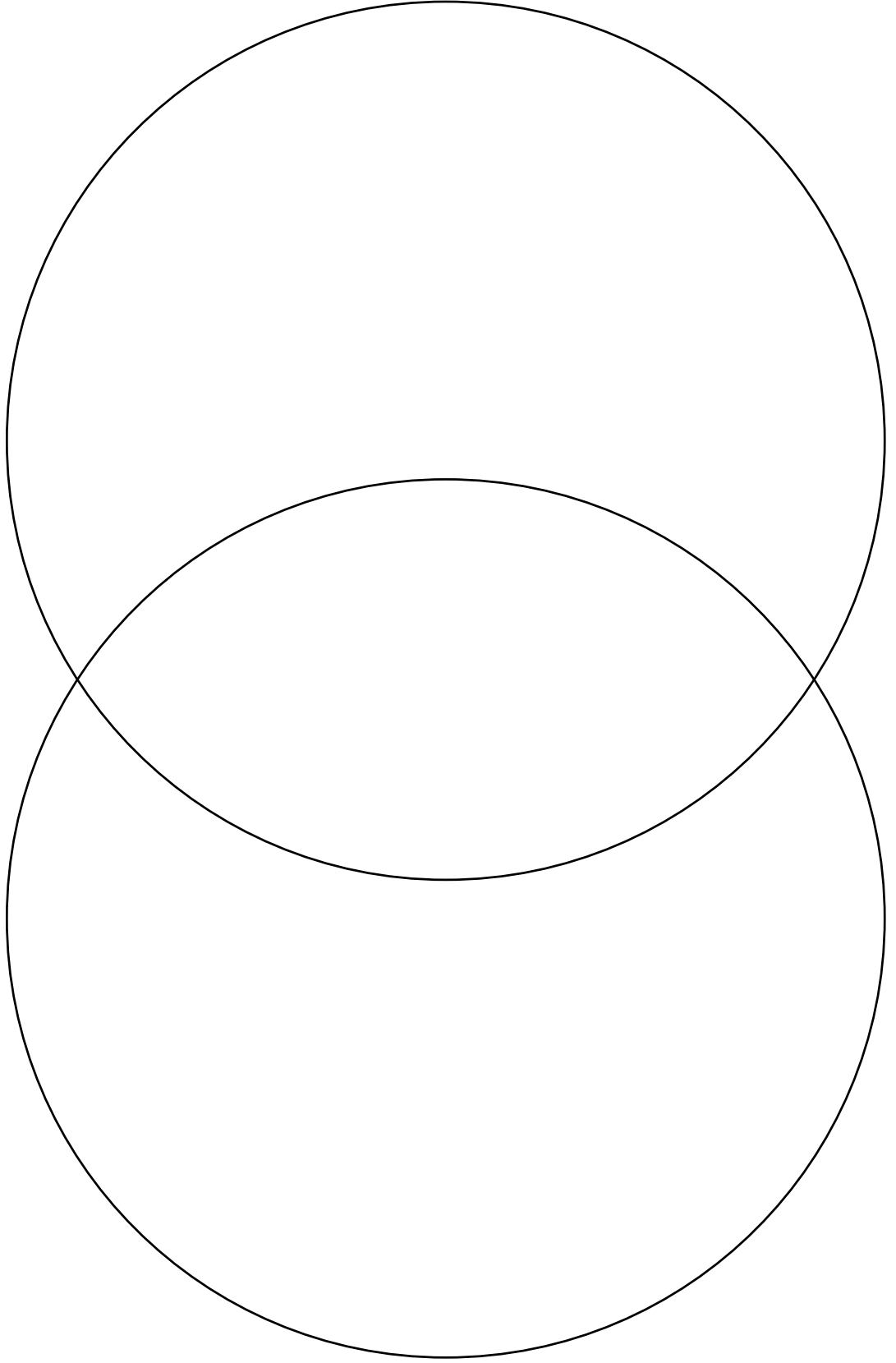
If possible, have an animal breeder or a farmer come in to talk to students about the differences in various breeds of animals or cultivars of crops such as apples or potatoes. Students can draw pictures with labels to show what they learned.

Comparing Animals: Venn Diagram

Name: _____

Animal 1:

Animal 2:



Comparing Dogs

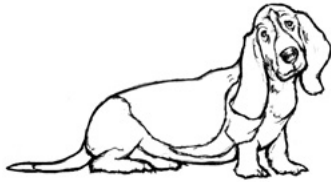
Name: _____



Newfoundland



Labrador retriever



Basset hound



Pomeranian

Three ways these dogs are the same:

1. _____
2. _____
3. _____

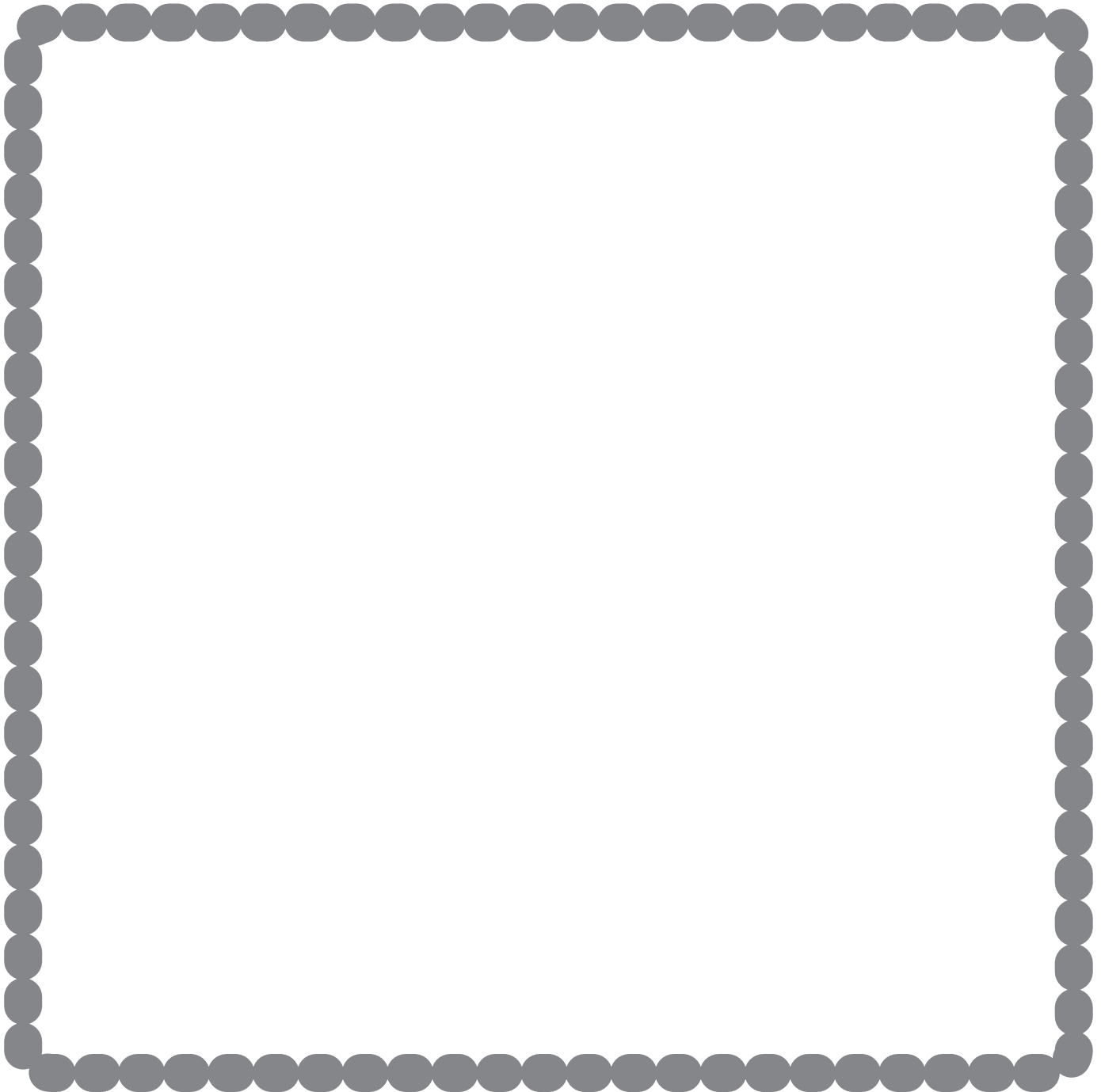
The Newfoundland and the Pomeranian are different because...

The Labrador and the Basset hound are different because...

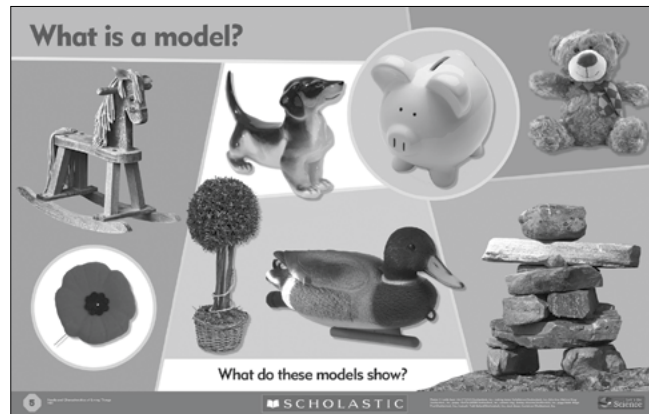
My Unique Face

Name: _____

Draw your face! What makes your face different from the faces of others?



How Can We Model Living Things?



Focus: Following the design process, students select an animal and design and build a model of that animal that is as accurate as they can make it.

Specific Curriculum Outcomes

Students will be expected to:

- 32.0 compare and evaluate personally constructed objects [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe how they used the design process to make accurate models of animals
- explain why they made the design choices they did in making their models
- compare their finished models with a photograph of the animal they are modelling and evaluate the accuracy of their model

NOTES:

Attitude Outcome Statements

Encourage students to:

- appreciate the importance of accuracy [GCO 4]
- show concern for their safety and that of others in carrying out activities and using materials [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- use writing and other forms of representation to explore, clarify, and reflect on their thoughts, feelings, experiences, and learnings; and to use their imaginations [GCO 8]
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes [GCO 9]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 5 • Unit 2, Science Card 6 (optional) • <i>What Is The Design Process?</i> poster • BLM <i>My Animal Model</i> • BLM <i>Animal Model Gallery Walk</i>	• a selection of models of animals such as stuffed toys, plastic figurines, wooden statuettes, and stone carvings • videos and photographs of animals • students' Science Journals • a wide variety of construction materials that might include construction paper, cardboard, newspaper, crayons, markers, paint, scissors, glue, tape, string; craft sticks, pipe cleaners, cardboard tubes, feathers, fun fur, modelling clay, papier mâché, foam balls, cloth • digital camera (optional)	• Invite students, in advance, to bring in models of animals from home. Give examples: a stuffed animal, a plastic animal figurine, a wooden animal statuette, or a stone carving of an animal.	• model

Science Background

- Models and modelling are central to science. A model is a visual, physical, verbal, or mathematical explanation of an object, living thing, phenomenon or concept. Scientists use models to help them visualize, explore, and explain a wide variety of things. For example, astronomers might use a model of our solar system to show how the planets orbit around the Sun. Engineers use computer models to help them test designs before they are actually built.
- Any physical representation of an animal or plant can be seen as a model, although many are produced for reasons other than accurately representing an organism for scientific study. So although a teddy bear resembles a real bear in some ways, the goal in designing it was cuddliness.

Possible Misconceptions

- The term “model” has many different meanings in English, and this may confuse students—they may think of a fashion model or a role model. Acknowledge that the term has different meanings in English and focus on the meaning as it relates to science. It may help to use familiar examples. For example, students may relate to model trains and model airplanes, which are scaled-down representations of the real objects. These are similar to the models of animals that students will be making.

ACTIVATE



Models of Plants and Animals

Have students look at the images of models of plants and animals shown on Science Card 5. Read and discuss the title question: *What is a model?* Ask:

- **What do these models show?**
- **Which models are more realistic? What characteristics make them realistic?**
- **Which models are more unrealistic? What characteristics make them unrealistic?**

Discuss attributes of the models such as scale, texture, colour, depiction of physical characteristics, and other features that contribute to accuracy.

Have students think about why and how the models were made. Ask questions such as:

- **What material is the model made of?**
- **How was this model made?**
- **What is the purpose of this model? Was it intended to be an accurate representation of a living thing?**

Students can also examine Science Card 6 from Unit 2 and discuss which, if any, of the stuffed animals are realistic models and which are not.

CONNECT

Exploring Models

Provide a variety of models of animals for students to explore and play with. If students have brought in animal models from home, ask their permission before adding these models to the Curiosity Centre. Prompt students to compare the animal models with the animals they represent, using photographs, videos, or prior knowledge. Ask:

- **In what ways is this model like the animal it represents? In what way is it different?**
- **What materials were used to make the model?**
- **Does the choice of material make the model more realistic?**

CONSOLIDATE



Design and Build a Model of a Living Thing

Tell students that they will be building a model of an animal that is as accurate as they can make it. First ask them to choose an animal to model. Students can use their Focus Animal or choose a different animal if they wish.

Direct students' attention to the *What Is the Design Process?* poster and review the steps of the design process with them.

Step 1: Identify a Problem, Think of a Solution, and Make a Plan



Tell students that the problem they need to solve is how to build a model of their chosen animal that is as accurate as possible. Ask students to make labelled drawings in their Science Journals to show how they will build their models. Ensure students have access to photographs of their chosen animal to use as reference. Help students plan by asking questions such as these:

- **How will you make your animal's body and limbs? What materials will you need?**
- **Will you make your model in several pieces? How will you join the pieces?**
- **What kind of body covering does the animal have? How will you represent that body covering in your model?**
- **How large will your model be?**

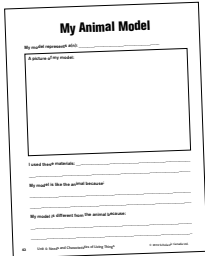
Step 2: Gather Materials and Build a Prototype

Provide a wide variety of materials for students to choose from such as:

- construction paper, cardboard, newspaper
- crayons, markers, paint
- scissors, glue, and tape
- string
- craft sticks
- pipe cleaners
- cardboard tubes
- feathers
- fun fur
- modelling clay
- papier mâché
- foam balls
- cloth

Students should gather their materials and any tools needed, and make their model. Students may choose to document the progress of their model using a digital camera (see the Explore More activity—Model-making Video).

Step 3: Test and Evaluate Your Solution/Device

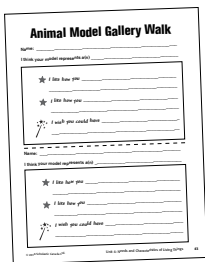
A worksheet titled "My Animal Model" with a large rectangular box for drawing a model. Below the box are several lines of text for reflection: "I used my materials...", "My model is like the animal because...", "My model is different from the animal because...", and "I can improve my model by...".

As they work, students should continuously compare their model to a photograph or photographs of the animal they are modelling. As you observe students at work, ask:

- In what ways is your model like the animal?
- In what ways is it different?
- Do you see any ways in which you could make your model more realistic?

Once students are satisfied with their model, they should complete BLM *My Animal Model*.

Step 4: Share Your Solution/Device and What You Learned

A worksheet titled "Animal Model Gallery Walk" with two identical sections. Each section has a box for drawing a model and three lines of text for feedback: "I like how you...", "I like how you...", and "I wish you could have...".

Set up a Gallery Walk so that students can view and comment on one another's models. Provide copies of BLM *Animal Model Gallery Walk* for students to display along with their models. Students viewing the model can fill in "two stars and a wish" to provide constructive feedback on other students' models. Provide students with an index card on which they can write the name of their animal. At first they should flip the card over so that viewers can try to identify the animal modelled before knowing its identity. Afterwards, students can show images of their animal for viewers to look at and compare with their model. After the Gallery Walk, allow students another opportunity to act on the feedback they have received to further improve on their models.

EXPLORE MORE

Model Environment

Students can add to their model by making a diorama scene depicting where the animal would live.

Model-making Video

Students can use the time-lapse feature on a digital camera, or take repeated images, to show the model at various stages of completion, and add voice-over describing the process, as well as the features of the finished model.

My Animal Model

Name: _____

My model represents a(n): _____

A picture of my model:

I used these materials: _____

My model is like the animal because:

My model is different from the animal because:

Animal Model Gallery Walk

Name: _____

I think your model represents a(n) _____

 *I like how you* _____

 *I like how you* _____

 *I wish you could have* _____

Name: _____

I think your model represents a(n) _____

 *I like how you* _____

 *I like how you* _____

 *I wish you could have* _____

What Do Living Things Need?



Focus: Students observe living things through direct experience and visual media, and identify similarities and differences in their specific needs.

Specific Curriculum Outcomes

Students will be expected to:

- 36.0 observe and identify similarities and differences in the needs of living things [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- communicate what a plant such as a tree or houseplant needs to survive
- communicate what a variety of animals need to survive

NOTES:

Attitude Outcome Statements

Encourage students to:

- consider their observations and their own ideas when drawing a conclusion [GCO 4]
- work with others in exploring and investigating [GCO 4]

Cross-Curricular Connections

Social Studies

Students will be expected to:

- recognize that all people have needs and wants [1.4.1]

English Language Arts

Students will be expected to:

- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes [GCO 9]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• <i>Ordinary Amos and the Amazing Fish</i> (Read Aloud) • Science Card 6 • Science Cards 2 and 3 (optional) • <i>What Is the Inquiry Process?</i> poster • BLM <i>Plant Needs Plan</i> • BLM <i>Plant Needs Results</i> • IWB Activity 7	• plants from the Growing Plants investigation • salt water • vinegar • soil • garden tools • cardboard boxes • scissors • students' Science Folders • students' Science Journals	• Sort through the plants from the Growing Plants investigation to find plants of approximately the same height and health to enable a valid comparison.	• basic needs • shelter

Safety

- Discuss safety procedures before beginning any investigation.

Science Background

- The basic needs that all living things share are food, water, air, and shelter.
- Air is a mixture of nitrogen, oxygen, carbon dioxide, water vapour, and other gases.

- Animals require oxygen for respiration, which is the process in which their cells break down glucose to release usable energy. Plants require both carbon dioxide (to make food through photosynthesis) and oxygen (for respiration).

Possible Misconceptions

- Students may wonder about the requirement for air and how it applies to animals that live in lakes, rivers, ponds, and oceans. Many animals that live under water, such as fish, have specialized body parts (gills in the case of fish) to let them get their oxygen from water. Other water-dwelling animals, such as dolphins, breathe air but are able to remain under water for long periods of time. Underwater plants get the carbon dioxide and oxygen they need from the water.

ACTIVATE

Read Aloud: *Ordinary Amos and the Amazing Fish*



Summary

In this humorous story, a man tries to catch a fish but ends up getting caught himself and kept as a pet under water by a family of fish.

Before Reading

Ask students if they have pets or if they have ever taken care of a pet. Ask:

- What kinds of things did the pet need?
- How did you help take care of the pet?

Tell students that you will be reading a story about a surprising pet. Ask them to listen to discover what things are provided for the pet.

During Reading

Prompts for discussion during reading could include:

Pages 2–3:

- Does Amos look happy or sad? Why do you think that is?

Pages 4–5:

- Have you ever been fishing?
- What did you do with the fish you caught?
- Why do people fish?

Pages 10–11:

- What do you think will happen to Amos now?

Pages 14–15:

- **How is a “person bowl” like a “fish bowl?” How is it different?**
- **Why did the fish need to put Amos in a special bowl to keep him alive under water?**

Pages 17–18

- **Did Amos like the chair?**
- **What might you put in a fish bowl?**

Pages 18–19:

- **Did Amos get fed ‘people’ food or fish food?**
- **What would you feed a pet fish?**

Pages 20–21:

- **Does Amos have everything he needs in his “person bowl?”**
- **Why is Amos not happy?**

Pages 24–25

- **Why is it important to look after your pet every day?**

After Reading

Ask students to imagine that they were in a “person bowl” under water. Ask:

- **What things would you *need* to have with you?**
- **What things would you *want* to have with you?**

Have students draw a picture of themselves in a “person bowl” with some of the things that they would need. Alternatively, using chart paper or the IWB, draw a “person bowl” and stick figure and have students come up and draw and/or label various things that they would need.

Needs and Wants Walls Activity

Label one wall as the “needs” wall and one wall as the “wants” wall. Ask questions about whether something is a “need” or a “want.” For example:

- **Is water to drink a want or a need?**
- **Is soda to drink a want or a need?**
- **Is healthy food a want or a need?**
- **Is the latest video game a want or a need?**

To broaden students’ thinking about wants and needs, have them continue the activity while thinking about the wants and needs of animals. Ask:

- **Does a dog want or need a dry place to sleep?**
- **Does a dog want or need a new chew toy?**

CONNECT



Animal Needs

Have students look at Science Card 6. Ask questions such as:

- What needs are shown in the pictures?
- What else does each living thing need?
- How are the living things' needs the same? How are they different?

The following needs are represented in the images on the card:

Water	Food	Shelter	Air/oxygen
- the dog is drinking water from a pond - the arctic char lives in water - the water lily floats on the surface of the water and draws in water through its roots	- the chipmunk is eating a berry - the puffin is eating capelin - the water lily, like all green plants, makes its own food through photosynthesis (sunlight + water + carbon dioxide --> glucose + oxygen)	- the polar bear is in a shelter it dug from snow - the snail carries its shelter with it (its shell)	- all of the land animals breathe air, which contains oxygen - the fish gets oxygen from water - the water lily absorbs carbon dioxide from the air for photosynthesis



Consider referring to Science Card 2 and Science Card 3. Ask students about the needs of the plants and animals shown on these cards. The pitcher plant on Science Card 3 is an interesting case of a plant that gets some of its food from insects it traps. (The pitcher plant also makes its own food through photosynthesis.)

You may choose to begin a KWLM chart for needs of living things. Refer to the chart often to allow students to add information and any new questions.

Allow students time at the Curiosity Centre to explore any questions they have about animal needs, and to pose new questions for the I Wonder Wall.

Plant Needs Inquiry

Explain to students that they will be using the plants they grew earlier in the unit to investigate plant needs. Direct students' attention to the *What Is the Inquiry Process?* poster and review the steps of the inquiry process with them.



Step 1: Ask a Question and Make a Plan

As a class, brainstorm questions about plant needs that the students could investigate. Examples could include:

- What happens if I don't water my plant?
- What happens if I water my plant with vinegar instead of water?

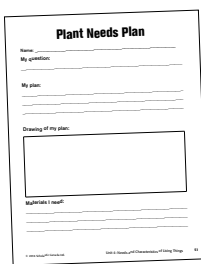
- What happens if I water my plant with salt water instead of water?
- What if I give my plant some plant food?
- What happens if I water my plant three times a day?
- What happens if I put my plant in sand instead of cotton balls?
- What if I move my plant to soil?
- What if I put my plant in a container of water?
- What happens if my plant doesn't get any light at all?
- What happens if my plant only gets light from a lamp?

Choose one question and discuss as a class how you could investigate the question. For example, to investigate what happens when plants get no light, you could place the plant under a box for several days. Discuss why it would be important to continue to water the plant throughout the investigation. (This is so that you know that any changes you see in the plant are due to lack of sunlight, not lack of water.)

Tell the class that you will maintain several plants in their cotton balls, in the sun, with the same level of watering that they have been getting. These are controls to compare the other plants against.

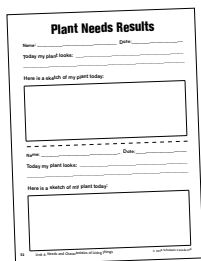
Organize the class into pairs or small groups. Each group should choose a question to investigate. (Alternatively, assign each group a question.) Ask students to make a prediction about the outcome of their investigation based on prior observations and knowledge. Groups can plan how they will carry out their inquiry and make a list of materials they will need (e.g., soil, salt water, a box). Each group should describe their plan to you and provide their list of materials. You can provide BLM *Plant Needs Plan* to help students make their plans.

Discuss with students any safety concerns associated with their plans.



The worksheet is titled "Plant Needs Plan". It includes sections for "Name", "My question", "My plan", "Drawing of my plan", and "My prediction".

Step 2: Explore and Record Your Results



The worksheet is titled "Plant Needs Results". It includes sections for "Name", "Today my plant looks:", "Here is a sketch of my plant today:", "Date", "Today my plant looks:", and "Here is a sketch of my plant today:". There is also a small icon of a folder next to the worksheet.

Students should carry out their plan for investigating their question. The investigation will need to occur over several days for the results to become evident. Students should record their observations each day on copies of BLM *Plant Needs Results* using words, sketches, and digital cameras or tablets, if available. (See also Explore More on page 50.) Students should store their notes in their Science Folders.

Step 3: Think About the Results and Make Conclusions

At the end of the time period you have designated for the investigation, have students gather in their pairs or groups to discuss their results. Prompt them to look at the question they asked at the beginning of the investigation. Ask:

- What happened to your plant over the time you observed it?
- Based on your observations, how would you answer your question?
- Was your prediction correct?

Step 4: Share What You Learned

As a class, discuss and compare results. Bring all of the plants to the front of the class and have pairs and groups take turns describing what happened to their plants during the investigation. Ask:

- What do plants need?
- What happens when plants do not get what they need?
- Is it possible for plants to get too much of what they need (e.g., water)? What happens then?

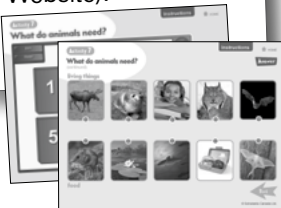


Encourage students to record any new questions they may have on the I Wonder Wall.

CONSOLIDATE

IWB Activity:

Students can use Activity 7: *What do animals need?* to match animals with their shelters on slide 1 and food on slide 2 (see the Teacher's Website).



Comparing Animal Needs

Have students create a Venn diagram to compare the needs of two living things. For example, students could compare the needs of pairs such as the following:

- a house plant and a dog
- a goldfish and a cat
- a cow and a corn plant
- a black bear and a robin
- an orca whale and a moose
- a cod and a dandelion

Focus Animal

Have students use the Curiosity Centre and the Reading Centre to research the needs of their Focus Animal. They should record what they find out in their Science Journals.

EXPLORE MORE

Animals and Their Homes

Students can begin to explore the importance of an animal's home—its habitat—by researching why specific animals need to live in certain conditions. They could research habitat for their Focus Animal, or for animals such as polar bears with disappearing habitat.

Video

Have students use a time-lapse app to create a video showing the changes in their plant over time during the Plant Needs investigation.

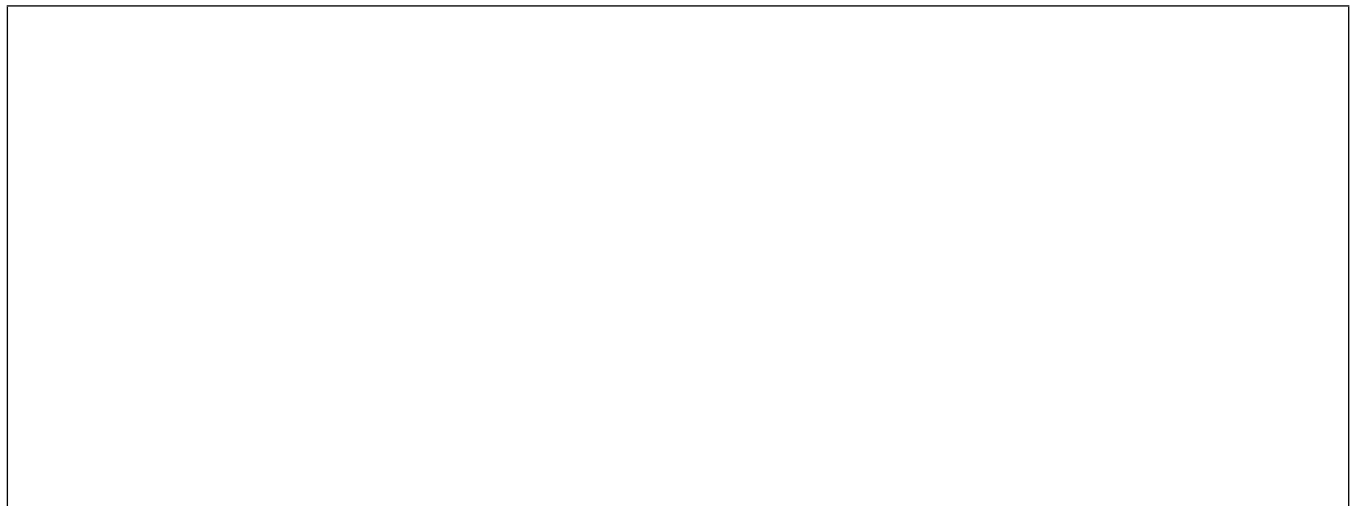
Plant Needs Plan

Name: _____

My question:

My plan:

Drawing of my plan:



Materials I need:

Plant Needs Results

Name: _____ Date: _____

Today my plant looks: _____

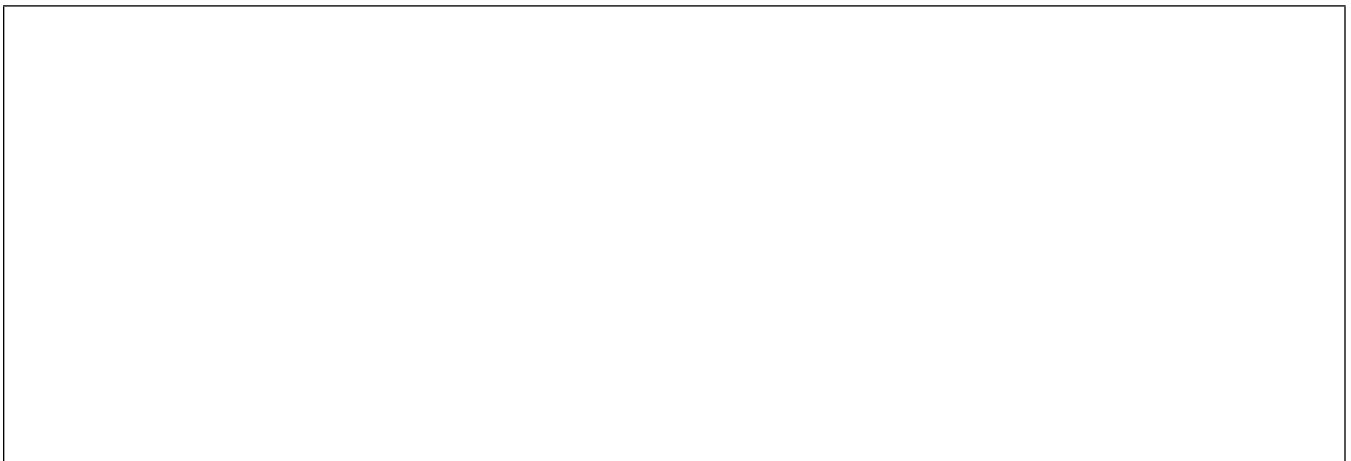
Here is a sketch of my plant today:



Name: _____ Date: _____

Today my plant looks: _____

Here is a sketch of my plant today:



How Do Living Things Meet Their Needs?



Focus: Students will explore how living things meet their needs for food, water, and shelter. In particular, they will explore how humans and other animals, as well as plants, move to meet their needs. Students will predict the movement of a living thing based on its observable physical characteristics.

Specific Curriculum Outcomes

Students will be expected to:

- 37.0 describe different ways plants and animals meet their needs [GCO 1/3]
- 38.0 describe the different ways that humans and other living things move to meet their needs [GCO 1/3]
- 40.0 recognize that living things depend on their environment, and identify personal actions that contribute to a healthy environment [GCO 1/3]
- 10.0 predict based on an observed pattern [GCO 2]
- use observed physical characteristics of an unfamiliar animal to predict how it meets its needs
- describe how living things depend on their environment to meet their needs

NOTES:

Performance Indicators

Students who achieve these outcomes will be able to:

- describe how the physical characteristics and movements of animals (including humans), and plants, help them to meet their needs

Attitude Outcome Statements

Encourage students to:

- be open minded in their explorations [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 7 • Science Cards 2 and 3 (optional) Literacy Place: • <i>Move Like the Animals</i> (Shared e-Reading) • <i>Whose Teeth Are These?</i> (Read Aloud–Predicting Strategy Unit)	• cardboard box with a hole cut in it • students' Science Journals • index cards	• Find plant motion videos (see Additional Resources on page 83) • Invite an Elder to talk about traditional ways of using observations of animal movement. • Prepare index cards with names of animals.	• environment

Science Background

- Animals move in different ways to find or capture food, escape from danger, and even build their own shelter. Often the physical characteristics of an animal give clues as to how animals move, where they live, and how they meet their needs in their own environment. Some examples are given below.

Animal	Physical characteristic	Significance
arctic hare	thick white winter coat	An arctic hare's warm winter coat of fur lets it survive the cold temperatures of its northern habitat. The bright white colour against the snow provides camouflage against predators.
hawk	broad wings	Broad wings enable a hawk to soar high overhead, conserving energy while searching for prey with sharp eyesight.
lobster	large front claws	A lobster uses its large front claws to grab, crush, and cut prey. (In some species left and right claws have slightly different structures and functions.)
polar bear	huge paws	The huge paws of a polar bear let it walk and run on ice and snow without slipping or sinking.
moose	long legs	The long legs of a moose let it wade through deep wetlands in search of food.
sea star	tube feet	A sea star's tube feet let it attach to surfaces on the ocean floor by suction, grabbing and releasing in order to move. The tube feet are also used to catch prey.

Possible Misconceptions

- Students may believe that plants do not move. In fact plants do move through various mechanisms, but the movement is often very slow. For example, when a plant is placed such that it is getting sunlight from one direction only, it will grow towards the light. (The cells on the side with no light lengthen, pushing the plant towards the light.) A brief inquiry on plant movement, described below in the Plant Movement activity, will let students observe this phenomenon firsthand. Some plants also exhibit fast movement, however. Consider showing students videos of the following:
 - the mimosa’s response to touch
 - the Venus flytrap’s response to prey

You can also find videos showing time-lapse movement of plants towards light (search on phototropism) or the growth of roots towards Earth and stem away from Earth in response to gravity (search on geotropism).

ACTIVATE

What Is an Animal’s Environment?

Write “environment” on chart paper or the IWB. Surrounding the word, add pictures of three animals that live in different environments, such as a beaver (pond), a crab (ocean), and an arctic hare (tundra). For each animal, ask:

- What words can we use to describe this animal’s environment?
- What other living things would be found in this animal’s environment?
- What non-living things would be found in this animal’s environment?

Post students’ suggestions next to the appropriate animal. Add the word “environment” to the Word Wall.



A Beaver Pond

Continue the discussion of beavers by having students look at the illustration on Science Card 7. Ask:

- What are the beaver’s needs?
- What parts of the environment help the beaver to meet its needs?
- What physical characteristics of the beaver help it to meet its needs?
- What are some other living things in the illustration and what are their needs?
- How do these living things meet their needs?

Through discussion, draw out the ways in which the beavers depend on their environment to meet their needs. Help students relate the observable characteristics of a beaver to the ways in which it meets its needs. Key points about the connection between the beavers’ needs and their environment include the following:

- Beavers need a deep, still body of water to build their lodge and provide habitat for the aquatic plants they eat during warm months.



- To create a pond like this, the beavers need to use trees growing nearby to build a dam across a river.
- In the pond they create, beavers build their lodge, which provides shelter. A hole in the roof provides ventilation to make sure they have enough air to breathe.
- Aquatic plants such as water lilies and cattails grow in the pond, providing food for the beavers.

Key points connecting beavers' physical characteristics with how they meet their needs include the following:

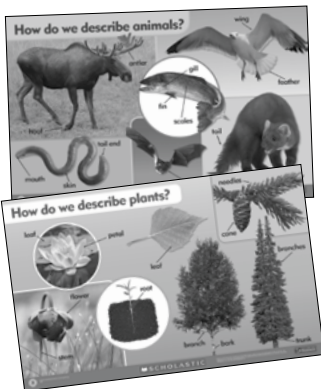
- Beavers' strong front teeth enable them to gnaw through trees and branches to provide building materials. (A beaver's teeth look orange because they are coated with an enamel that contains iron, making them extremely strong. The beaver's teeth grow continuously, so they do not get worn down by constant gnawing.)
- A beaver uses its webbed feet for swimming.
- A beaver's large, flat tail is used for slapping the surface of the water when it detects danger, making a loud noise to alert other beavers. It is also used for steering in the water and stability on land.
- Thick fur protects a beaver from the cold. A beaver's coat has long hairs for waterproofing and short, fine hairs for warmth. In addition, a beaver has a gland-like sac near its tail that secretes (releases) a strong-smelling, oily substance called castoreum. Beavers use castoreum to mark territory but also use their feet to spread it over their body to keep their fur waterproof.

Consider revisiting Science Cards 2 and 3, and having students discuss the needs of the animals and plants shown, and how they meet their needs.

Animal Movement Role-Play

As a class, have students role-play various animal movements such as trotting, flying, and swimming. Ask:

- **How does this movement help the animal meet its needs?**
- **How do the animal's body parts help it move in this way?**



Literacy Place Connection:

Revisit or read *Move Like the Animals* by Ray Leoni, and invite students to connect their feelings to the different ways that animals move. View the videos showing how the animals move and have students role-play the movements. Encourage students to think about why the animals move the way they do. Ask:

- **How does the movement of [the animal] help it to meet its needs?**

CONNECT

Plant Movement

Choose several plants that are still in good condition after the Plant Needs Inquiry (see page 48). Place them under a box with a hole cut in it. Make sure the hole end is facing the sunlight. Ask students to predict what will happen if the plants are left in the box for several days. Water the plants each day. After several days remove the box and observe and discuss the results as a class.

After completing their investigations with the plants, allow students to take them home to plant indoors or out.

Observing Animal Movements

Invite an Elder to visit the class and describe how hunters use observations of animal movements when they are hunting game or how the movements of animals were part of their ancestors' daily or annual routines.



Focus Animal

Allow students time to research how their Focus Animal meets its needs and to add this information to their Science Journals.

CONSOLIDATE

Predicting the Needs of an Unfamiliar Animal

Conduct interviews with students. Have them practise the skill of prediction by observing the physical characteristics of an unfamiliar local animal, such as a wolverine, a turr (common murre), a sea cucumber, an anemone, or a sea urchin, and predicting how it meets its needs based on its physical characteristics.



Literacy Place Connection:

Revisit or read *Whose Teeth Are These?* by Wayne Lynch to the students. Invite students to predict how each animal's teeth helps it to meet its needs.

Animal Charades

Have students play animal movement charades. Provide a list of animals on index cards. Students take turns to choose a card and act out the movement of the animal on the card. Other students guess which animal they are portraying and give reasons. Animals could include the following:

- bear
- cat
- dog
- duck

- crab
- frog
- giraffe
- hare
- horse
- monkey
- salmon
- snake
- whale

EXPLORE MORE

Imaginary Living Thing

Have students create a labelled diagram of a living thing of their own invention and describe how it meets its needs. If time permits, students could create models of their imaginary living thing and its environment.

Comparing Cod and Minke Whale Tails

Both cod and minke whales swim under water, and both have tails with fins that help propel them through the ocean. Challenge students to conduct Internet research to find out the important difference between fish tails and whale tails and what this means for the movement of the animal. Answer: Cod tails (like all fish tails) move side to side, while minke whale tails (like all marine mammal tails) move up and down. The up and down motion helps lift the mammals out of the water to breathe air. They also use their tails to communicate by slapping the water. (The two types of tails—fish and mammal—are different due to different evolutionary pathways.)

How Do We Use and Care for Living Things?



Focus: Students describe ways that humans use their knowledge of plants and animals to meet their own needs [e.g., animals and plants for food; animals for wool, fur, and leather, plants for clothing (cotton); trees for shelter (wood)]. Students describe how humans use their knowledge to meet the needs of plants and animals in their care.

Specific Curriculum Outcomes

Students will be expected to:

- 39.0 describe ways humans use their knowledge of living things in meeting their own needs and the needs of plants and animals [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- identify a variety of ways in which humans use their knowledge of living things to meet their needs
- describe how we use our knowledge to care for the animals we use to meet our needs

NOTES:

Attitude Outcome Statements

Encourage students to:

- recognize the role and contribution of science in their understanding of the world [GCO 4]
- show interest in and curiosity about objects and events within the immediate environment [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- speak and listen to explore, extend clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]
- use writing and other forms of representation to explore, clarify, and reflect on their thoughts, feelings, experiences, and learnings; and to use their imaginations [GCO 8]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 8 • IWB Activity 8 • Science Card 9 • Science Card 1 (optional) Literacy Place: • <i>School Days</i> (“Caring for Speedy” pages 14–16, Shared Reading–Active Learning Kit)	• variety of items made of natural materials • poster board • craft supplies	• Arrange for a visit from someone knowledgeable about caring for animals. • Arrange for a class trip to a farm or other place where living things are raised for human use, hunted, fished, gathered. • Have members of the local Aboriginal community describe traditional recipes created from foods hunted or gathered.	• farm/farming • raise (in the context of farming)

Safety

- Review school safety rules before students go on a class trip.
- If tasting foods, ensure students are not allergic to any foods being tasted.

Science Background

- One way that humans can meet their needs for food is by hunting, fishing, and gathering. People still do these things to help meet their needs. But many thousands of years ago, some human societies developed technologies of farming, enabling them to settle in one place and produce large volumes of food crops. People also began domesticating animals, such as dogs, sheep, goats, cows, and pigs. Fish and other aquatic animals can be farmed, too. Successful farmers need to know the needs of the plants and animals in their care and how to meet them.

Possible Misconceptions

- Students may not connect some familiar materials, such as leather or cotton, with living things. Also, students may not connect items such as fur or wood with farming. Provide a wide variety of examples of items made from living things and their sources. Include some unexpected examples, such as penicillin antibiotics, which are made from fungi. Another example is the traditional use of capelin or seaweed (kelp) as a fertilizer for home gardens.

ACTIVATE



Sources of Foods and Natural Materials

Use Science Card 8 to get students thinking and asking questions about the sources of the natural materials that make familiar objects, and also the sources of the food they eat. Read the title question: Where does it come from? then ask:

- **What living thing was used to make this item?**
- **How does this item meet a human need?**
- **In what other ways do we use living things to meet our needs?**

Science Card 8 shows a number of foods and other items that come from living things. They include the following, clockwise from top left:

- sweater made from wool
- field berries (blueberry, raspberry, black currant, red currant, blackberry, strawberry)
- boots made from sealskin
- house frame made from wood
- hood lining made from coyote fur
- hat made from wool
- hard boiled eggs from a chicken
- jeans made from cotton
- milk from a cow
- T-shirt made from cotton
- salmon steak from a salmon

As a class, discuss how the items were obtained. For example, the wool came from sheep raised on a farm and shorn of their woolly coat. The eggs came from chickens raised on a farm for the purpose of producing eggs. The salmon may have come from farmed salmon or salmon caught in the wild.

Allow students to explore and play freely with a variety of items made of natural materials such as those at the Curiosity Centre. Invite students to suggest and bring in other items to add.

Encourage students to ask questions and record them on the I Wonder Wall.



IWB Activity:

- Invite students to
- match objects to the
- living thing that is its
- source using Activity
- 8: *What's the source?*
- (see the Teacher's
- Website).



An Elder's Perspective on Using Plants and Animals

Have an Elder talk to the class about how they make use of animals and plants when living on the land or how their ancestors made use of different plants and animals (i.e. which plants did they use for medicine? What uses did they have for certain animals other than for food?, etc).

Invite an Innu, Inuit, or Mi'kmaq Elder to talk to the students about how all parts of an animal were used, particularly in traditional culture. The Elder could also address the practical reasons why early Aboriginal peoples learned to make use of all the resources available from the animals and plants in their area.

What's On the Menu?

Provide a list of plants and animals farmed, hunted, or fished in Newfoundland and Labrador for food. Students can identify ones they have eaten or would like to try. Some examples include:

- vegetables (including turnip, potato, carrot, cabbage, beet, and onions)
- berries (picked wild: bake apples, blueberries, and partridgeberries; farmed: strawberries and cranberries)
- meat (farmed: cattle, sheep (lamb), pigs; hunted: caribou, hare, moose, seal)
- poultry (chickens, turkey, eggs; hunted: ducks, partridge, turr)
- fish and seafood (cod, crab, lobster, mussels, salmon, scallops, shrimp, trout)
- dairy (goats, sheep, and cows)

CONNECT

Caring for Living Things

Display Science Card 9. Tell students that each photograph shows a way that humans care for living things that will be used to meet their needs. Ask:

- **What living thing is shown here?**
- **How will the living thing be used?**
- **How is the living thing being cared for?**

The photographs show the following:

- Tomato seedlings are being planted. The plastic is to protect the ground from frost.
- An East Coast fish farm. The man is feeding the fish. The fish are being raised to be eaten by people.
- Chicks being raised on a chicken farm. The heat lamp is keeping the chicks warm. The chicks may become laying hens or chickens to be eaten.





- A coniferous seedling is being planted in a spot where it will have sunlight and room to grow. The tree will eventually be cut down to make paper or wood for building.
- A variety of plants in a greenhouse. The greenhouse protects the plants from cold, windy weather while allowing sunshine to come through. The greenhouse worker is watering the plants.
- A sheep on a sheep farm. The veterinarian shown is checking the health of the sheep.

Consider revisiting Science Card 1 and have students discuss how the farmer cares for the living things shown. Ask:

- **What living things are shown?**
- **How will the living thing be used?**
- **How is the living thing being cared for?**

Encourage students to ask questions about how people care for living thing. Add the questions to the I Wonder Wall.

Class Trip

Take a trip to a local farm, community garden, fish plant, or other location where animals or plants are raised for human use, fished, hunted, gathered, or processed. While on the trip, encourage students to take turns taking digital pictures to record the trip.

On returning to the class, ask questions such as these (as applicable):

- **What living things did we see being raised/fished/hunted/gathered?**
- **For what purpose will the living things be used?**
- **How are the living things being cared for? What needs do they have?**
- **What knowledge of the plant or animal was used to fish, hunt, or gather it?**



Encourage students to ask their own questions and add them to the I Wonder Wall. Print the digital pictures and use them to make a display about the trip. Have the students produce drawings and sentences with information about the living things you saw, the purpose for which they were being raised, and the ways in which their needs were being met.

Class Visit

Arrange for a naturalist, hunter, fisher, farmer, grandparent, Elder from an Aboriginal community, or other knowledgeable person to discuss how they use living things to meet human needs. Or, arrange for a veterinarian or animal shelter worker to visit and describe how we care for the animals we use to meet our needs.

CONSOLIDATE



Literacy Place Connection:

"Caring for Speedy" on pages 14–16 of *School Days* provides a "how-to" for caring for a class pet (a hamster, in this case). Revisit or read the text with students and ask:

- What does a hamster need to survive?
- Why do you think students enjoy having a class pet

Pet Rules

If you have a class pet, work as a class to develop a set of rules for caring for the class pet. Discuss the importance of each rule developed and relate it to the basic needs of the pet. Make a poster using the rules and post it close to the pet. Then have students work in pairs to develop a set of simple rules for caring for a house plant or a pet at home (real or imagined).

A Local Meal

Have students design a meal or product made entirely of foods or natural materials from Newfoundland and Labrador. They can format their meal as a menu or create a labelled drawing or a collage made from cutouts from magazines.

If possible, invite members from the local Aboriginal community to describe traditional recipes for meals created from foods hunted or gathered. Students could be invited to sample dried arctic char (Inuit) or dried caribou (Innu or Mi'kmaq). Where facilities exist, a traditional moose or caribou stew could be prepared and shared among the students.

EXPLORE MORE

Time Machine

Students can research the ways that Aboriginal peoples or early settlers used living things to meet their needs in the past and compare their findings to how people meet their needs using living things today. Students can choose one need to focus on such as shelter and clothing or food. They can use the Internet and books in the Reading Centre to conduct their research, and may also talk to a knowledgeable person such as an Elder or museum worker. Have students create a poster to communicate their findings.

Virtual Farm

Allow students to create their own virtual farm using a program such as Farmville.

How Can We Contribute to a Healthy Environment?



Focus: Students recognize that living things depend on their environment to fulfill their needs. If the environment does not meet their needs, they will have to move to a new area in order to survive. Students identify simple actions they can do to help maintain a healthy natural environment.

Specific Curriculum Outcomes

Students will be expected to:

- 40.0 recognize that living things depend on their environment, and identify personal actions that contribute to a healthy environment [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- explain why it is important to maintain a healthy natural environment
- list ways in which they can contribute to maintaining a healthy natural environment

NOTES:

Attitude Outcome Statements

Encourage students to:

- be sensitive to the needs of other people, other living things, and the local environment [GCO 4]
- be open-minded in their explorations [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes [GCO 9]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• <i>The Very Hungry Bear</i> (Read Aloud) • Science Card 10 • IWB Activity 9 Literacy Place: • <i>The Bug Hotel</i> (Shared Reading–Synthesizing Strategy Unit) • <i>How to be an Eco Class</i> (Shared Reading–I Can Make a Difference Inquiry Unit)	• print or video news stories about animals found in unexpected places due to loss of habitat • large scrapbook or binder to make class book of Focus Animals • construction paper • markers and/or crayons and/or paint • scissors • glue	• Gather news items from print or video media about animals being found in unexpected places due to loss of habitat.	• compost • habitat • native plants • recycle • reduce • reuse

Science Background

- With their knowledge about their own needs, as well as the needs of other living things, students can appreciate why maintaining a healthy environment is important for everyone.
- Humans can negatively affect the environment in many ways, including through development, pollution, logging, and greenhouse gas production leading to climate change.
- Humans can also help the environment. Even small acts such as turning off a light or planting a garden with native plants can help support a healthy environment.

Possible Misconceptions

- Students may not realize that there is a hierarchy implied in the “reduce, reuse, recycle” mantra. The best option is to reduce, because then you are not using any energy or material resources in the first place. The next best option is to reuse, because then you are not creating demand for new products. Recycling is better than throwing items in the garbage, because it allows materials to be repurposed, and diverts waste from landfill, but it still requires energy and produces waste through the processes of recycling.

ACTIVATE

In the News

Read or show a print or video media story or stories about animals found in unexpected places—black bears, polar bears, moose, caribou, coyotes or wolves wandering into urban or suburban areas. Ask questions such as:

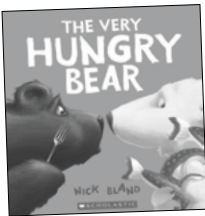
- **Why do you think the animal left its home?**
- **How would the animal meet its needs in the city/town/suburb?**
- **What problems might this cause for the animal and for people living nearby?**
- **What might be some ways to prevent this from happening?**



Have students ask their own questions about the stories and post them on the I Wonder Wall.

CONNECT

Read Aloud: *The Very Hungry Bear*



Summary

What happens when an animal can no longer live in its environment? In this story, a brown bear tries to help a polar bear who needs to find a place to live.

Before Reading

Show students the front of the book and read the title. Tell students that the story is about a bear trying to find a new home. Ask:

- **Why do people move from one home to another?**
- **Have you ever moved from one home to another? How did you feel when you moved?**

Prompt students to think about what they know about black bears and polar bears. Ask:

- **How are their needs different?**
- **How are their needs the same?**

Ask students to listen as you read to decide what information in the story is factual and what is fictional.

During Reading

Prompts for discussion during reading could include:

- **Why is the polar bear looking for a new home?**
- **The brown bear can't resist the offer of fish. To him it is like an offer of a chocolate éclair! What is a chocolate éclair? What kinds of food do you find it hard to resist?**
- **Why is the brown bear's cave not suitable for the polar bear? Why is it a good home for a brown bear?**
- **Why was the mole's tunnel not suitable for the polar bear? Why is it a good home for a mole?**
- **What kind of home does the polar bear need?**

After Reading

Ask students to think about the parts of the story that were fictional and the parts of the story that were accurate. Ask:

- **Would a brown bear really have a fire in his cave?**
- **Would a mole really have a painting of the sky in his tunnel?**
- **What other parts of the story were fictional?**
- **Do bears love to eat fish?**
- **What other parts of the story were accurate?**

Tell students that because of human actions, polar bear habitat really is being threatened. Ask:

- **What are some reasons that animals might leave their homes?**
- **Why is it a problem when animals lose their homes?**
- **Why is it important for people to help protect the environment?**



Literacy Place Connection:

Revisit or read *The Bug Hotel* by Beverly Scudamore with students, and discuss how a boy observes all the different ways his backyard provides habitat for a variety of insects.



IWB Activity:

- Invite students to use
- Activity 9: *Sorting trash* to sort objects
- to recycle, compost,
- donate, or throw in
- the garbage (see the
- Teacher's Website).

Ways to Help

Use Science Card 10 as a jumping-off point to explore what students can do to protect or improve the health of the environment at school, at home, in the community, or in nature. Ask,

- How do these actions help ensure animals and plants can meet their needs?
- In what other ways can we help maintain a healthy natural environment?

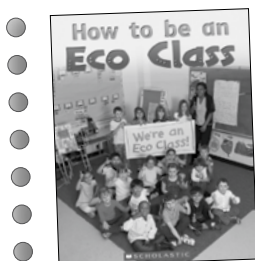
The card shows (clockwise from top left):

- cycling to school instead of being driven, which reduces harmful emissions from cars that contribute to pollution and global warming and also helps create healthy bodies;
- composting kitchen and yard waste, which reduces the amount of garbage going to the landfill and produces valuable nutrients to add back to the soil;
- planting native trees, which helps maintain or create habitat for animals;
- reducing water use to conserve water;
- a birdfeeder, which helps create a welcoming habitat for birds in urban areas, and helps local birds survive the winter;
- turning off the lights and other electrical devices when not in use, which reduces energy use (all forms of energy generation affect the environment);
- recycling plastics to reduce the amount that goes to landfills and allow materials to be used again.

CONSOLIDATE

School Environmental Audit

As a class, walk around the school looking for ways harm is being done to the environment and suggesting ways to improve the situation. On returning to the classroom, brainstorm a list of “to-dos” for a more environmentally friendly classroom and school. Students can then produce collages with “eco tips” to post around the school.



Literacy Place Connection:

Revisit or read *How to be an Eco Class* with students and discuss the list of tips for reducing, reusing, and recycling in the classroom. Ask:

- Which of these tips are we already following in our classroom?
- Are there any tips we should try?



Focus Animal Wrap-up

Allow students access to the Curiosity Centre and Reading Centre to research the kind of habitat required by their Focus Animal. They should make notes of what they find out in their Science Journals.

Provide paper and craft supplies. Each student can then use the information they have gathered throughout the unit on their Focus Animal to make two one-sided pages with drawings, cut-out pictures, and information on their animal. Glue the pages into a class Focus Animal scrapbook.

EXPLORE MORE

Eco Action at Home

Students can take photographs of things they do at home to help the environment (e.g., recycling, turning off lights, etc.). They can present these images to the class or small group as a slide show with recorded voiceover or live commentary.

WRAPPING UP THE UNIT



Revisit any remaining questions posted on the I Wonder Wall and have students discuss answers in small groups or with a partner. If there are questions which cannot be answered at the time, these can remain on the I Wonder Wall for students to research independently. Discuss what the students have learned about the needs and characteristics of living things.

Specific Curriculum Outcomes Checklist

Name: _____ Date: _____

Rating: 1 – not evident; 2 – with assistance; 3 – mostly on own; 4 – on own consistently

Specific Curriculum Outcomes	Rating and Observations
33.0 use a variety of sources of science information [GCO 2]	
34.0 respond to the ideas and actions of others in constructing their own understanding [GCO 2]	
35.0 identify and describe common characteristics of humans and other animals, and identify variations that make each person and animal unique [GCO 1/3]	
36.0 observe and identify similarities and differences in the needs of living things [GCO 1/3]	
37.0 describe different ways plants and animals meet their needs [GCO 1/3]	
38.0 describe the different ways that humans and other living things move to meet their needs [GCO 1/3]	
39.0 describe ways humans use their knowledge of living things in meeting their own needs and the needs of plants and animals [GCO 1/3]	
40.0 recognize that living things depend on their environment, and identify personal actions that contribute to a healthy environment [GCO 1/3]	
1.0 pose questions that lead to exploration and investigation [GCO 2]	
2.0 pose new questions that arise from what was learned [GCO 2]	
3.0 communicate using scientific terminology [GCO 2]	
7.0 make and record observations and measurements [GCO 2]	
9.0 sequence or group materials and objects [GCO 2]	
10.0 predict based on an observed pattern [GCO 2]	
32.0 compare and evaluate personally constructed objects [GCO 2]	

My Inquiry

Name: _____

My question:

My plan:

My results:

My conclusion:

How I will share what I learned:

Student Self-Assessment of Inquiry Process

Name: _____

Rating Scale  = Great  = Good  = Needs to be better

Step 1

I asked a question.



I made a plan.



Step 2

I followed my plan.



I recorded my results.



Step 3

I thought about my results.



I made a conclusion.



Step 4

I shared what I learned.



Teacher Assessment of Inquiry Process

Name: _____ Date: _____

	1	2	3	4
Initiating and Planning				
• poses a question that leads to exploration or investigation				
• makes a prediction based on an observed pattern				
• makes a simple plan				
• selects and uses materials				
Performing and Recording				
• carries out the plan/follows a simple procedure				
• uses appropriate tools				
• makes observations				
• records observations and measurements				
• uses a variety of sources of information and ideas				
• follows safety procedures and rules				
Analyzing and Interpreting				
• sequences or groups materials and objects				
• proposes an answer to the initial question and draws a simple conclusion				
• poses new questions that arise from what was learned				
Communicating and Teamwork				
• communicates while exploring and investigating				
• communicates using scientific terminology				
• communicates procedure and result				
• responds to ideas and actions of others in constructing their own understanding				

Comments:

Inquiry Process Rubric

	Level 1	Level 2	Level 3	Level 4
INITIATING AND PLANNING	talks about things that are of interest makes guesses about the outcome of an inquiry with prompting, offers ideas for a procedure with prompting, identifies some materials which could be used to carry out the plan	asks simple questions about objects and events that are observable makes simple predictions about the outcome of an inquiry, but they may be hoped-for outcomes contributes ideas for a procedure, but they may not be complete identifies some materials which could be used to carry out the plan	uses observations to ask questions to investigate, but questions are not always realistic makes simple predictions about the outcome of an inquiry based on prior observations provides ideas for a simple procedure selects and uses materials to carry out the plan	uses observations and prior knowledge to ask questions to investigate makes thoughtful predictions about the outcome of an inquiry based on prior observations and knowledge provides clear, sequential steps for a simple procedure selects and uses appropriate materials to carry out the plan and explains reasons for choice
PERFORMING AND RECORDING	carries out the plan/ follows a simple procedure with prompting with prompting, uses some appropriate tools with assistance makes simple observations using senses with prompting, records observations and measurements gets information from a teacher-chosen source needs help to follow safety procedures and rules	carries out the plan/ follows most of a simple procedure selects and uses common tools makes some relevant observations using senses records observations and measurements which may be incomplete identifies some relevant information from familiar sources needs occasional prompting to follow safety procedures and rules	carries out the plan/follows a simple procedure selects and uses some appropriate tools makes relevant observations using appropriate senses records observations and measurements accurately identifies relevant information from sources of the same type follows most safety procedures and rules	carries out the plan/ follows a simple procedure, making adjustments as necessary selects and uses all appropriate tools makes relevant, detailed observations using appropriate senses records observations and measurements accurately in a variety of ways identifies relevant information from a variety of sources follows all safety procedures and rules and explains why they are needed

Continued on next page...

Inquiry Process Rubric (Continued)

	Level 1	Level 2	Level 3	Level 4
ANALYZING AND INTERPRETING	sequences or groups materials and objects based on simple teacher-chosen attributes describes what happened with prompting, identifies some new questions but they may not be about this inquiry	sequences or groups materials and objects based on a few simple attributes draws a simple conclusion based on observations, but may not link conclusion to the initial question identifies some simple new questions on the topic of this inquiry	sequences or groups materials and objects based on multiple attributes draws a conclusion based on observations which link to the initial question identifies some new questions on the topic of this inquiry that could be investigated	accurately sequences or groups materials and objects based on multiple attributes draws a conclusion based on observations and states if it supports or refutes their prediction identifies new questions on the topic of this inquiry and suggests how they could be investigated
COMMUNICATING AND TEAMWORK	willingly asks for help and accepts help from other group members understands some scientific terminology but rarely uses it with prompting, describes the result and some of the procedures with prompting, asks some questions related to new learnings	makes suggestions to group members as to what should be done understands simple scientific terminology, but does not always use it correctly communicates basic information about the result and most of the procedures asks some questions related to new learnings, but may not fully understand the information	communicates with group members, sometimes with problems usually uses scientific terminology appropriately communicates most of the information about the result and procedures asks some questions in order to understand new learnings	communicates and works effectively with group members consistently uses scientific terminology appropriately accurately communicates the information about the result and procedures asks clarifying questions in order to fully understand new learnings

My Design

Name: _____

The problem:

My solution and my plan:

How I will test my solution:

How my solution worked:

How I will share my solution and what I learned:

Student Self-Assessment of Design Process

Name: _____

Rating Scale  = Great  = Good  = Needs to be better

Step 1			
I identified the problem.			
I chose a solution and made a plan.			
Step 2			
I built my solution.			
Step 3			
I tested my solution.			
I evaluated my solution.			
Step 4			
I shared my solution and what I learned.			

Teacher Assessment of Design Process

Name: _____ Date: _____

	1	2	3	4
Initiating and Planning				
• identifies a problem to be solved				
• thinks of a possible solution to the problem and makes a simple plan				
• selects and uses materials				
Performing and Recording				
• carries out the plan/follows a simple procedure				
• uses appropriate tools				
• makes and records observations and measurements				
• constructs a prototype				
• follows safety procedures and rules				
Analyzing and Interpreting				
• proposes an answer to the initial problem				
• compares and evaluates personally-constructed objects				
• poses new questions that arise from what was learned				
Communicating and Teamwork				
• communicates while exploring and investigating				
• communicates using scientific terminology				
• communicates procedure and result				
• responds to ideas and actions of others in constructing their own understanding				

Comments:

Design Process Rubric

	Level 1	Level 2	Level 3	Level 4
INITIATING AND PLANNING	works on a problem set by the teacher or group suggests a solution to the problem and, with prompting, offers ideas about procedure with prompting, identifies some materials which could be used to carry out the plan	identifies a problem to solve, but it may not be practical suggests a solution to the problem and makes a simple plan identifies some materials which could be used to carry out the plan	identifies a practical problem to solve suggests several possible solutions to the problem and chooses one; makes a simple plan selects and uses appropriate materials to carry out the plan	identifies a practical problem to solve and gives some criteria for solving it suggests several possible solutions to the problem that address the criteria; chooses the best solution and makes a simple plan selects and uses appropriate materials to carry out the plan and explains reasons for choice
PERFORMING AND RECORDING	with prompting, carries out the plan/follows a simple procedure with prompting, uses some appropriate tools with assistance constructs a prototype but does not follow the plan needs help to follow safety procedures and rules makes simple observations using senses; with prompting, records observations and measurements	carries out the plan/follows most of a simple procedure selects and uses common tools constructs a prototype according to the plan, but the device may not be usable needs occasional prompting to follow safety procedures and rules makes some relevant observations using senses; records observations and measurements which may be incomplete	carries out the plan/follows a simple procedure selects and uses some appropriate tools constructs a usable prototype according to the plan follows most safety procedures and rules makes relevant observations using appropriate senses; records observations and measurements accurately	carries out the plan/follows a simple procedure, making adjustments as necessary selects and uses all appropriate tools constructs a usable prototype according to the plan with modifications for improvement follows all safety procedures and rules and explains why they are needed makes relevant, detailed observations using appropriate senses; records observations and measurements accurately in a variety of ways

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Design Process Rubric (Continued)

	Level 1	Level 2	Level 3	Level 4
ANALYZING AND INTERPRETING	with prompting, says whether or not a solution works with prompting, makes simple suggestions for changes to improve the device/solution with prompting, identifies some new questions but they may not be on the same topic	says whether a solution works in terms of some simple criteria suggests some practical changes to improve the device/solution identifies some new questions on the same topic	evaluates and explains the effectiveness of a solution in terms of simple criteria suggests and makes practical changes to improve the device/solution identifies some new questions that arise from the solution	evaluates and explains the effectiveness of a solution in terms of a broad range of criteria makes effective changes to improve the device/solution identifies new questions that arise from the solution and suggests how they could be solved
COMMUNICATING AND TEAMWORK	willingly asks for help and accepts help from other group members understands some scientific terminology but rarely uses it with prompting, describes the solution and some of the procedures with prompting, asks some questions related to the solution	makes suggestions to group members as to what should be done understands simple scientific terminology, but does not always use it correctly communicates basic information about the solution and most of the procedures asks some questions related to the solution, but may not fully understand the information	communicates with group members, sometimes with problems usually uses scientific terminology appropriately communicates most of the information about the solution and procedures asks some questions in order to understand the solution	communicates and works effectively with group members consistently uses scientific terminology appropriately accurately communicates the information about the solution and procedures asks clarifying questions in order to fully understand the solution

Additional Resources

Non-fiction Books

Big & Little, by Steve Jenkins (Houghton-Mifflin Harcourt, 1997)

Biggest, Strongest, Fastest, by Steve Jenkins (Houghton-Mifflin Harcourt, 1997)

Look-Alike Animals, by Robin Bernard (Scholastic, 1994)

What Do You Do With a Tail Like This? by Steve Jenkins and Robin Page (Houghton-Mifflin Harcourt, 2008)

Who Has These Feet? by Laura Hulbert and Eric Brooks (Scholastic, 2011)

Picture Books

The Curious Garden, by Peter Brown (Word Alive, 2009)

An Extraordinary Egg, by Leo Leonni (Scholastic, 1998)

From Head to Toe, by Eric Carle (Scholastic, 1999)

A House for Hermit Crab, by Eric Carle (Scholastic, 2002)

My Dog's the Best! by Stephanie Calmenson (Scholastic, 1997)

The Salamander Room, by Anne Mazer (Dragonfly Books, 1994)

Stellaluna, by Janelle Cannon (Scholastic, 1993)

The Tree, by Dana Lyons and David Danioth (Illumination Arts Publishing Company, 2002)

Where Once There Was a Wood, by Denise Fleming (Scholastic, 2000)

Websites for Students

Canadian Geographic Kids — Animal Facts

<http://www.canadiangeographic.ca/kids/animal-facts/animals.asp>

Canadian Geographic Kids — Create a Creature

<http://www.canadiangeographic.ca/kids/flash/games/creature.swf>

National Geographic Kids — Green Tips

<http://kids.nationalgeographic.com/explore/science/green-tips/#green-tips-tree.jpg>

National Geographic Kids — Animals

<http://kids.nationalgeographic.com/animals/>

PBS Kids — Nature Games

<http://pbskids.org/games/nature/>

TVO Kids — Animal Actions activity

<http://www.tvokids.com/shows/animalactions>

TVO Kids — Animal Here or There activity

<http://www.tvokids.com/games/animalhereorthere>

Egg Sorting Videos

Eggs 101: Egg Processing

<https://www.youtube.com/watch?v=mCQWVn1AfHs>

Discovery — “How It’s Made” Eggs

www.youtube.com/watch?v=aYhEbjhhcAg

Note: You may wish to stop the video at 4:32 minutes before mention is made of hens being sent to the slaughterhouse.

Plant Motion Videos

Discovery — Venus flytrap video

<http://www.discovery.com/tv-shows/life/videos/venus-flytrap-catches-flies/>

Youtube (Akshay Marathe) — Touch-me-not plant (Mimosa pudica in action)

<https://www.youtube.com/watch?v=nPf3FbR6eQE>

Youtube (Scott Wright) — Grade 3 Student’s Phototropism Experiment

<https://www.youtube.com/watch?v=tLYOBi5gaVs>

Youtube (thechangelingmedusa) — Phototropism and Geotropism Time Lapse Montage

<https://www.youtube.com/watch?v=F3Oj2er-91s>

Websites for Teachers

Animal Fact Guide — Animal Facts

<http://www.animalfactguide.com/>

Canadian Geographic — Wildlife Videos

http://www.canadiangeographic.ca/magazine/back_issues/search.asp?tagID=119&tag=Wildlife

Canadian Wildlife Federation — Animals

<http://cwf-fcf.org/en/discover-wildlife/flora-fauna/fauna/>

David Suzuki — What you can do (Ways to Help the Environment)

<http://www.davidsuzuki.org/what-you-can-do/>

Explore.org — Live Animal Cams

<http://explore.org/live-cams/player/puffin-loafing-ledge-cam>

Heritage Newfoundland & Labrador — Aboriginal Peoples

<http://www.heritage.nf.ca/aboriginal/default.html>

Hinterland Who’s Who — Wildlife Videos

<http://www.hww.ca/en/the-wild-gang/videos/>

Nature Newfoundland and Labrador — Seabirds and Sea Ducks of Labrador (poster)

<http://naturenl.ca/wp-content/uploads/2012/01/Seabird-Placemat-FinalCompressed.pdf>

Newfoundland Nature — An online atlas of wildlife sightings in Newfoundland and Labrador built using observations reported by ordinary people.

<http://www.nlnature.com/>

Dear parents and caregivers,

We are about to start an exciting new unit in science where we will be exploring the needs and characteristics of living things. Through a variety of hands-on explorations and investigations, your child will be developing an understanding of the amazing variety in nature and the connections among the health of the environment and the needs of plants and animals, including those of humans.

You can talk to your child at home about what your family does to help keep the environment healthy, such as turning off lights when you are not in a room, or recycling glass, paper, plastic, and metal waste items.

To ensure a wide range of experiences and make connections between this topic and your child's world, he/she may choose to bring one or more personal items to school for exploration during in-class activities. These items will be returned home once explorations are completed. To determine whether the item(s) is appropriate please contact me, your child's teacher.

Sincerely,