

Grade **2** Animal Growth and Changes

TEACHER'S GUIDE

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Animal Growth and Changes

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Let's Do Science, Newfoundland and Labrador

Grade 2 Unit 4: Animal Growth and Changes Teacher's Guide

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Welcome to the *Animal Growth and Changes* Unit

In this unit, students develop their understanding of the life cycles of various animals, including mammals, birds, fish, amphibians, reptiles, and insects, through a variety of explorations and investigations. Multiple components will engage students and support learning of the specific science concepts.

Science Cards

This collection of 12 Science Cards will support students' exploration of animal growth and changes 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. *Alligator Baby* by Robert Munsch tells the humorous story of Kristen who must find the “people baby” that is her new baby brother after her parents repeatedly bring the wrong infant home from the zoo. The comical illustrations allow students to compare the appearance and actions of the babies to those of their parents and help students to consider some of the changes that an animal experiences during its life cycle.

Our Love Grows by Anna Pignataro is the gentle story of Pip, who wonders when he will grow big, and his Mama who points out all of ways he has already grown since he was born. The text and illustrations demonstrate some of the ways humans change as they grow and develop.



Anchor Video

The Anchor Video: *Animal Growth and Changes*, found on the Teacher’s Website, introduces students to essential questions about how animals, including humans, grow and change. The video gives a number of examples to activate students’ thinking and to promote questions.

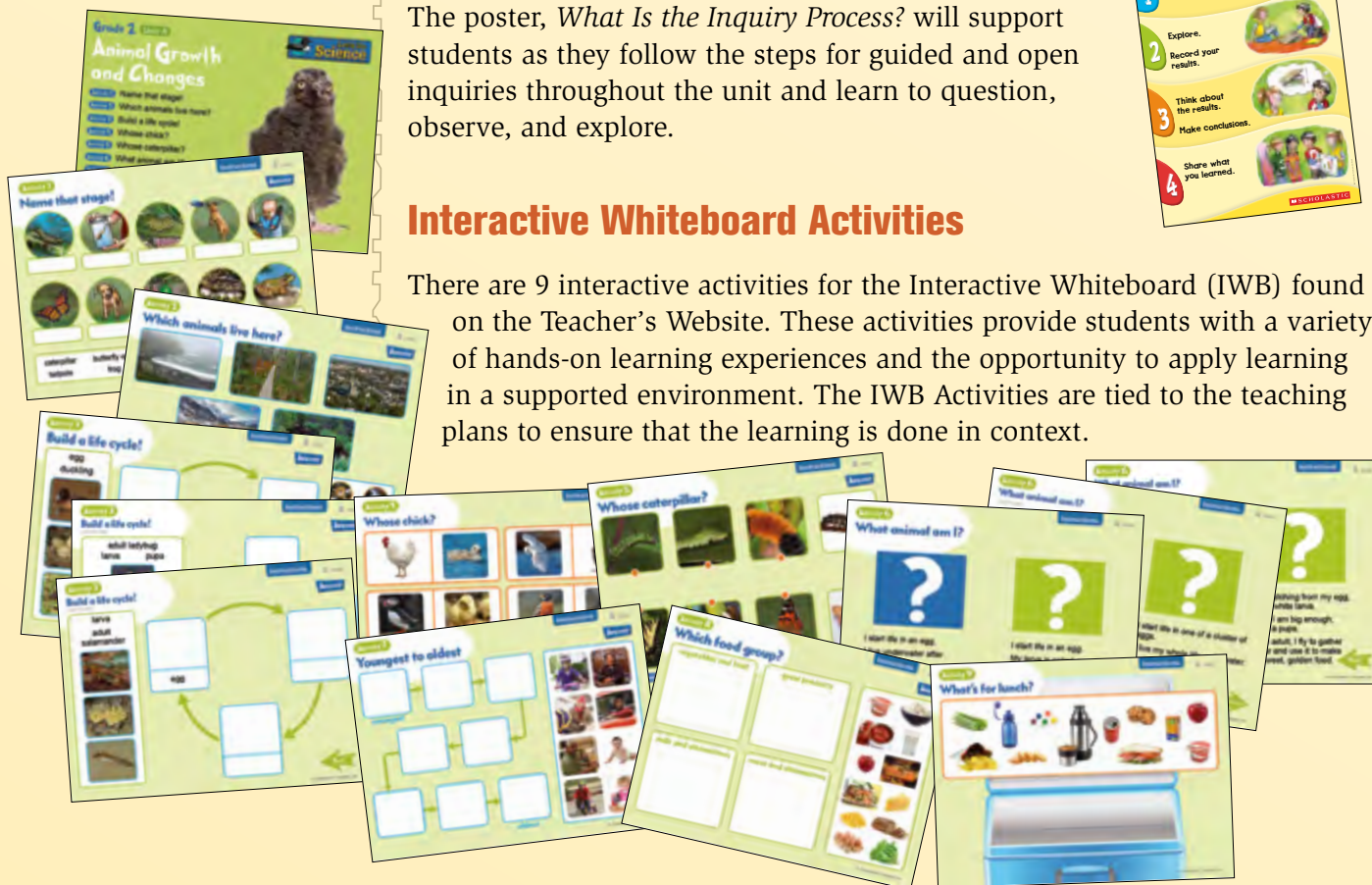
Poster

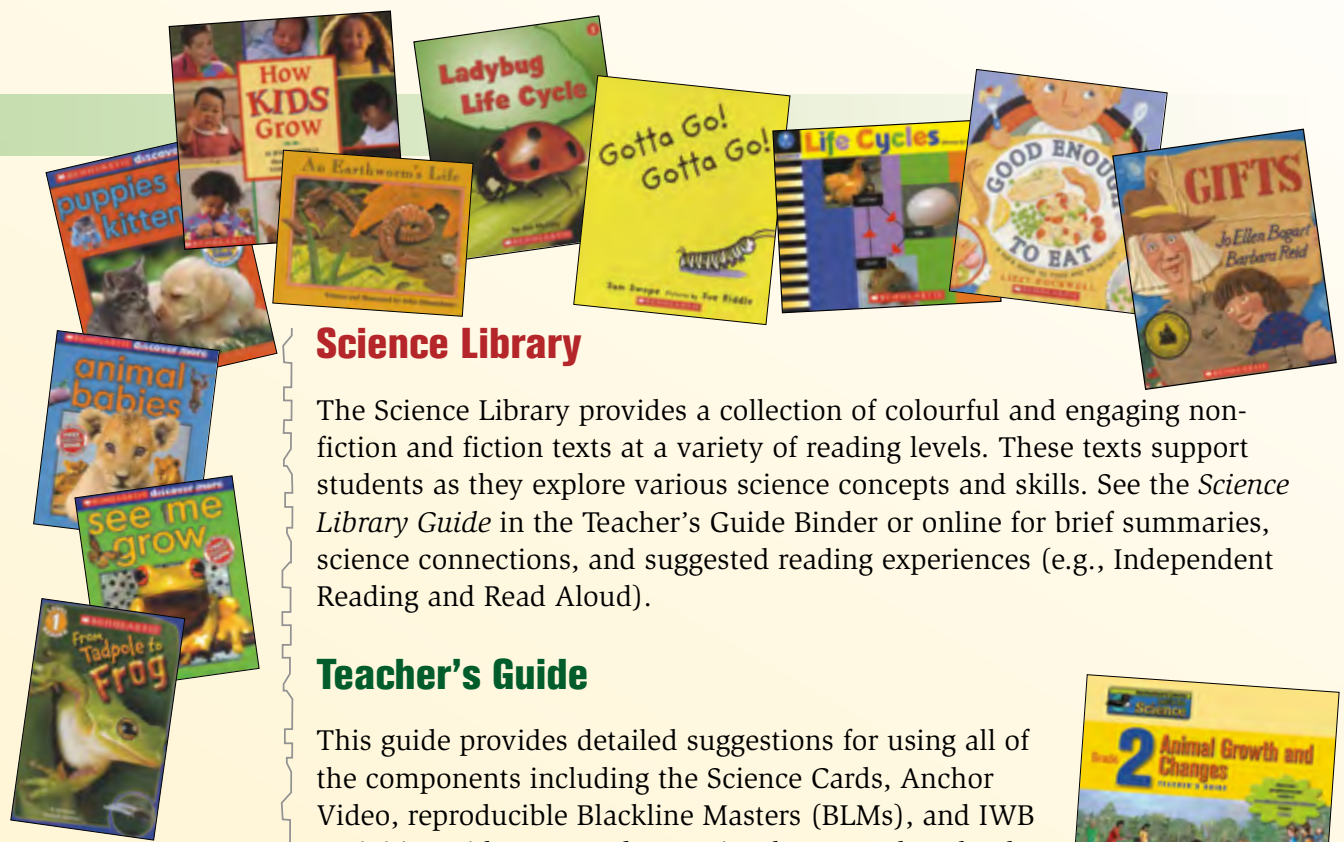
The poster, *What Is the Inquiry Process?* will support students as they follow the steps for guided and open inquiries throughout the unit and learn to question, observe, and explore.



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.





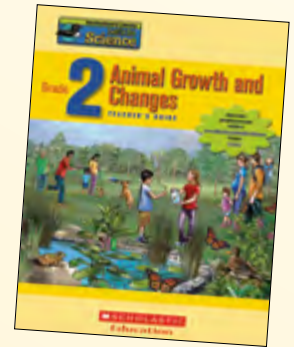
Science Library

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 experiences (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 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 and Read Aloud texts, and one Conversation Card from *Literacy Place for the Early Years*, Grade 2 that relate to the concepts explored in *Animal Growth and Changes*.



Teacher's Website

In addition to the Science Cards, Anchor Video, and IWB Activities mentioned above, this 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.

www.scholastic.ca/education/nlscience

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Planning Guide for *Animal Growth and Changes*

Teaching Plans	Specific Curriculum Outcomes	Components	Materials	Literacy Place Connections
What Is a Life Cycle? Teachers and students begin to pose questions related to the growth, changes, and life cycles of humans and other animals, and identify ways to answer those questions. Teachers begin to model scientific terminology relating to growth, changes, and life cycles of humans and other animals.	Skills [GCO 2] • 1.0 • 2.0 • 30.0	- Science Card 1 - Anchor Video: <i>Animal Growth and Changes</i> - Science Card 2 - IWB Activity 1 - BLM <i>My Life Cycle Question</i>	- large sheets of paper - interlocking cubes - index cards - recipe boxes - students' Science Folders	
How Can We Observe a Life Cycle? Students observe the life cycle of a live animal in a habitat set up in class.	Skills [GCO 2] • 6.0 • 7.0 • 9.0 STSE/K [GCO 1/3] • 41.0	<i>Alligator Baby</i> (Read Aloud) - Science Card 3	- animals for study - food and enclosure for animals (based on animal to be studied) - box for artifact box activity - items for artifact box (will depend on animal to be studied) - students' Science Journals - students' Science Folders - craft supplies including modelling clay, paint, paper, and glue	<i>Starting Life: Crocodile</i> (Read Aloud–Sequencing Strategy Unit) <i>Dragonflies Are Amazing!</i> (Guided Reading, Level O)
What Do Animals Need From Their Environments? Students explore animals in their natural environment and observe how the animals eat, drink, move, and seek shelter. They apply this learning to requirements for human-made habitats.	STSE/K [GCO 1/3] • 42.0	- Science Card 4 - Science Card 5 - IWB Activity 2 <i>What Is the Inquiry Process?</i> poster	- one large, clear, wide-mouthed jar for each student or small group of students - cheesecloth or paper towel and elastics - students' Science Journals - students' Science Folders - a wide variety of construction materials that might include construction paper, cardboard, cardboard boxes, newspaper, crayons, markers, paint, scissors, glue, tape, string, craft sticks, pipe cleaners, cardboard tubes, felt, modelling clay, papier mâché, foam balls, cloth, aluminum trays, paper towel rolls	<i>We Are Wolves</i> (Read Aloud–Analyzing Strategy Unit)

Teaching Plans	Specific Curriculum Outcomes	Components	Materials	Literacy Place Connections
What Are the Life Cycles of Different Animals? Students investigate the various stages of the life cycles of different animals.	STSE/K [GCO 1/3] • 43.0	- Science Card 6 - Science Card 7 - Science Card 2 (optional) - IWB Activity 3 - IWB Activity 4 - IWB Activity 5	- students' Science Journals - paper plates (2 per student) - paper fasteners (1 per student) - markers, colouring pencils, or crayons	<i>Pictorial Diagram: Frog Life Cycle</i> (Conversation Card # 14 –Active Learning Kit) <i>Who Laid These Eggs?</i> (Guided Reading, Level F)
How Do Different Life Cycles Compare? Students group and sort animals based on the similarities and differences between their life cycles.	Skills [GCO 2] • 10.0 STSE/K [GCO 1/3] • 44.0	- Science Card 8 - IWB Activity 6 - BLM <i>Life Cycle Trivia Cards</i>	- images of a variety of animals - small toys representing animals - students' Science Journals - paper plates - drawing materials	<i>Flying Acrobats</i> (Guided Reading, Level M)
How Do Traits Change as Animals Grow and Develop? Students explore constant and changing traits in humans and other animals, with a focus on humans.	STSE/K [GCO 1/3] • 45.0	- Science Card 9 - BLM <i>Constant and Changing Traits</i>	- small sticky notes - students' Science Journals - students' Science Folders	
How Do Humans Grow and Develop? Students explore changes in physical and behavioural traits in humans as they grow and develop. These traits are compared to the development of other animals.	Skills [GCO 2] • 14.0 • 19.0 • 40.0 STSE/K [GCO 1/3] • 46.0 • 47.0	<i>Our Love Grows</i> (Read Aloud) - Science Card 10 - IWB Activity 7 <i>What Is the Inquiry Process?</i> poster - BLM <i>It's Better to Be...</i>	- Velcro strips - large piece of felt - students' Science Folders - large sheets of paper and markers - construction paper - string - interlocking cubes - modelling clay	<i>Whales</i> (Guided Reading, Level J)

Continued on next page...

Planning Guide for *Animal Growth and Changes* (continued)

Teaching Plans	Specific Curriculum Outcomes	Components	Materials	Literacy Place Connections
Why Are Food Choices Important? Students learn why making good choices about what to eat and drink is important to their growth and development.	STSE/K [GCO 1/3] • 48.0	- Science Card 11 - BLM <i>Supermarket Scavenger Hunt</i> - IWB Activity 8 - BLM <i>Food Journal</i> - IWB Activity 9	- selection of food for artifact box - box - food magazines and grocery flyers - craft materials such as poster board, construction paper, markers, glue, scissors	
What Choices Can We Make to Stay Healthy? Students learn how regular movement and other practices can help them stay healthy.	Skills [GCO 2] • 31.0 STSE/K [GCO 1/3] • 49.0	- Science Card 12 - BLM <i>My Favourite Way to Move</i>	- glitter - bar soap and water - liquid soap and water - plain water - dry paper towels - hand sanitizer - stopwatches - large graph paper - coloured sticky notes - students' Science Journals - variety of board games and card games - craft supplies such as poster board, markers, glue, scissors - dice - paper fasteners - modelling clay - small toys	

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 objects related to animal growth and changes.

The Curiosity Centre could have

- class pets such as fish, guinea pigs, rabbits, rats, turtles, gerbils, or lizards
- bug boxes, viewing glasses, empty terrariums and aquariums, fish bowls, and magnification tools
- items relating to different stages of animal life cycles, such as the molted exoskeleton of a dragonfly or other insect, eggshells from a bird egg, mounted specimens of insects at various stages
- items relating to different stages of human development, including baby-related items such as toys, diapers, and bottles; or devices used by elderly people
- access to live-feed video showing animal life cycles
- images depicting a variety of life cycles
- toy models of a variety of animals
- student photos, perhaps taken against a wall height chart
- a mirror for students to examine their own facial traits
- copies of Canada's food guide
- cookbooks; restaurant menus; grocery flyers; plastic food toys; food magazines; dried foods such as beans, rice, and pasta in sealed containers; a variety of canned goods

Check the centre frequently to ensure it is well stocked with items. Invite students to contribute to the centre by bringing in items or images related to animal life cycles.

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



Check that students are recording appropriately in their Science Journals, ensuring that

they date each entry and record ideas using sketches with labels, lists of words, or sentences. Continue to encourage them to add new questions or ideas to their Journals as often as they like.

Remind students that they should store completed BLMs, drawings, graphs, etc. that are related to the *Animal Growth and Changes* unit in their Science Folders.

3. Word Wall



Continue to 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

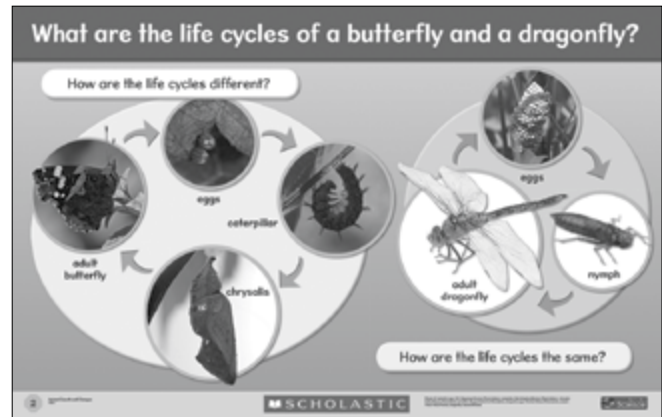


Continue to build the I Wonder Wall throughout the unit by posting students' questions as they arise. Refer to the I Wonder Wall often and select questions that students may be ready to answer.

5. Reading Centre

Add texts (books, magazines, and photographs) relating to animal growth and changes (life cycles) to the Reading Centre. Or, you may choose to include these texts in the Curiosity Centre to stimulate discussion and questions. The titles in the Science Library will help start off a collection of books. Also, refer to the lists of texts pertaining to Animal Growth and Changes in the Additional Resources section of this guide (pages 81–83).

What Is a Life Cycle?



Focus: Teachers and students begin to pose questions related to the growth, changes, and life cycles of humans and other animals, and identify ways to answer those questions. Teachers begin to model scientific vocabulary relating to growth, changes, and life cycles of humans and other animals.

Specific Curriculum Outcomes

Students will be expected to:

- 1.0 pose questions that lead to exploration and investigation [GCO 2]
- 2.0 communicate using scientific terminology [GCO 2]
- 30.0 identify and use a variety of sources of science information and ideas [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- generate reasonable questions based on innate curiosity and personal experiences
- use correct vocabulary appropriately when communicating about animal life cycles

NOTES:

Attitude Outcome Statements

Encourage students to:

- recognize the role and contribution of science in their understanding of the world [GCO 4]

Cross-Curricular Connections

Social Studies

Students will be expected to:

- describe how people's interactions with their environment have changed over time [2.4.2]

Math

It is expected that students will:

- measure length to the nearest non-standard unit by using multiple copies of a unit or by using a single copy of a unit [2SS4]

English Language Arts

Students will be expected to:

- select, read, and view with understanding a range of literature, information, media, and visual text [GCO 4]
- 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 1 • Anchor Video: <i>Animal Growth and Changes</i> • Science Card 2 • IWB Activity 1 • BLM <i>My Life Cycle Question</i>	• large sheets of paper • interlocking cubes • index cards • recipe boxes • students' Science Folders	• Gather books and artifacts relating to animal life cycles for the Curiosity Centre. • Arrange for an Elder or an Indigenous Knowledge Keeper to visit the classroom. Note: You may wish to order the animals you plan to study in this unit from a science supply company. (See the Science Background section of <i>How Can We Observe a Life Cycle?</i> on page 18 for factors to consider when choosing an animal.)	• life cycle • egg • caterpillar • pupa • chrysalis • nymph • butterfly • dragonfly • tadpole • frog

Science Background

- All living things pass through a series of stages from the beginning of their life until their death. For any particular animal, these stages are known as that animal's life cycle.

- The life cycles of animals are incredibly diverse, and although generalizations can be made about similarities within animal classes, there are always exceptions. For example, nearly all mammals give birth to live young; the two exceptions are the duck-billed platypus and the echidna. Only a small percentage of all animal species give birth to live young—most animals lay eggs.

Possible Misconceptions

- Students may not think of humans as animals. Tell students that the two most familiar kingdoms of living things are plants and animals, and that we are part of the animal kingdom. Be sure to include humans as examples when discussing animals, and point out the similarities between human life cycles and the life cycles of other mammals as opportunities arise throughout the unit.
- It may be surprising for students to learn that caterpillars and butterflies are the same animal. Even students who know that caterpillars become butterflies may not realize that caterpillars come from eggs. Students may also be surprised about the variety of animals that lay eggs. Expose students to as many life cycles as possible throughout the unit so that students develop an appreciation for both the variety and the recurring patterns among animal life cycles.

ACTIVATE



Life Cycle Stages

Show students Science Card 1 and ask:

- Which person shown in the picture is the youngest? How do you know?
- Which person shown in the picture is the oldest? How do you know?
- How can you describe the different animals you see in this picture?
- Which animals in this picture lay eggs?
- What happens when the eggs hatch?
- What questions do you have about the people and animals in the picture?



Record any questions students may have on the I Wonder Wall. Begin to model the use of scientific vocabulary relating to life cycles. Add terms such as “egg,” “caterpillar,” and “pupa” to the Word Wall. You may choose to begin a class KWLM chart about how animals grow and change which can be updated throughout the unit as students revise their thinking about the topic.

An Elder's Perspective

Invite an Elder or an Indigenous Knowledge Keeper to visit the classroom and talk about how the life cycles of plants and animals affect or influence their traditional way of life. As well, the person could share how the life cycles of plants and animals are incorporated into traditional stories and songs. Elders could give the names of some local animals in their traditional language.



Anchor Video

Play the Anchor Video: *Animal Growth and Changes* which is located on the Teacher's Website. Set a focus for viewing by asking students to think about how animals, including humans, change as they grow from babies to adults. Invite students to give examples of how they have changed since they were babies. You may choose to pause the video to allow students to answer questions or to discuss any questions which students may have.

Curiosity Centre

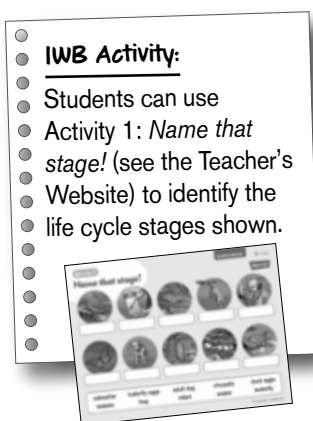
Collect intriguing books, pictures, and artifacts that relate to animal life cycles and add them to the Curiosity Centre. Introduce Science Card 2, which shows details of the life cycles of the butterfly and dragonfly, then place this card at the Curiosity Centre. Invite students to examine the card to see what they notice about life cycles. Allow students time for exploration. You may provide index cards or sticky notes at the Curiosity Centre for students to record questions that arise as they explore. Questions can later be added to the I Wonder Wall.

CONNECT

Brainstorming Session

As a class, brainstorm sources of science information about life cycles from both inside and outside the classroom. Record these on a research anchor chart. Sources could include the following:

- the Internet
- books
- science magazines
- pet stores
- veterinarians or animal hospitals
- aquariums
- insectariums
- nature parks
- museums
- farms
- discussion with family members
- discussion with Elders or Indigenous Knowledge Keepers
- observation of animals in nature
- observation of people and pets at home



My Growth and Development

Students can practise the skill of measuring by determining and recording one another's height. One way to do this is to have students trace one another's outlines lying straight on a large sheet of paper, and then measure the outline from top to bottom. They can also measure and record foot length. Students may use interlocking cubes or other appropriate materials to take their measurements. In addition, have students take digital pictures of one another.

They will have the opportunity to revisit these measurements and records later in the unit. If possible, it is a good idea to take these records and measurements at the beginning of the year.

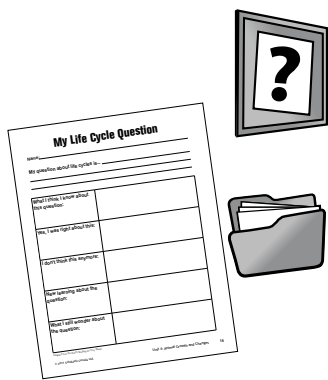
Life Cycle Poems and Songs

Continue to introduce and model scientific vocabulary by teaching life cycle poems and songs that students can recite and sing. There are many of these to be found by searching the Internet. (See *Additional Resources* on pages 81–83 for suggestions.)

A Life Cycle Word Box

Provide students with index cards and recipe boxes. As new terms arise, students can record them on the index cards (one term per card) using pictures and/or words to record their meanings. Alternatively, you could punch holes in the cards and connect them with shower curtain rings.

CONSOLIDATE



Researching to Answer a Question

Have students choose a question about animal life cycles from the I Wonder Wall to investigate. Copy and distribute BLM *My Life Cycle Question*. The BLM uses the RAN strategy to help students organize their thinking and record what they find out. Remind students to store their completed BLMs in their Science Folders.

Indigenous Names for Local Animals

Have students choose a local animal and research the name it is given by Mi'kmaq, Inuit, or Innu people, or by another local Indigenous group. Caribou, wolf, bear, lynx, fox, eagle, and moose are some examples of animals students could research.

EXPLORE MORE

Collecting Sources

Have students look for photographs (magazine photos or family photos), books, artifacts, and other items that they can bring in to share with the class that relate to human or other animal life cycles.

My Life Cycle Question

Name: _____

My question about life cycles is... _____

What I think I know about this question:	
Yes, I was right about this:	
I don't think this anymore:	
New learning about the question:	
What I still wonder about the question:	

Adapted from the R.A.N. Strategy by Tony Stead

How Can We Observe a Life Cycle?



Focus: Students observe the life cycle of a live animal in a habitat set up in class.

Specific Curriculum Outcomes

Students will be expected to:

- 6.0 predict based on an observed pattern [GCO 2]
- 7.0 make and record observations and measurements [GCO 2]
- 9.0 propose an answer to an initial question or problem and draw a simple conclusion [GCO 2]
- 41.0 investigate changes in the appearance and activity of an animal as it goes through its life cycle [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe in detail the life cycle of the animal studied in the classroom

NOTES:

Attitude Outcome Statements

Encourage students to:

- willingly observe, question, and explore [GCO 4]

Cross-Curricular Connections

Math

It is expected that students will:

- relate the size of a unit of measure to the number of non-standard units used to measure length and mass [2SS2]

Art

Students will be expected to:

- demonstrate positive interactive skills through collaborative art making [2.3.3]

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]
- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• <i>Alligator Baby</i> (Read Aloud) • Science Card 3 Literacy Place: • <i>Starting Life: Crocodile</i> (Read Aloud–Sequencing Strategy Unit) • <i>Dragonflies Are Amazing!</i> (Guided Reading, Level O)	• animals for study • food and enclosure for animals (based on animal to be studied) • box for artifact box activity • students' Science Journals • items for artifact box (will depend on animal to be studied) • craft supplies, including modelling clay, paint, paper, and glue	• If you haven't done so already, order the animals you plan to study from a science supply company. (Note that students will have the opportunity to collect and observe live local organisms later in the unit.)	• size • appearance • movement • diet • Specific vocabulary related to the life cycle stages of the animal chosen for study.

Safety

- Ensure that students follow established safety procedures when handling live animals such as making the teacher aware of any allergies; handling animals gently and knowing when it is better not to handle them at all; washing hands after handling animals.

Science Background

- In choosing an animal to study in the classroom, you will want to consider a number of factors, including cost and length of time required to observe the various stages of the life cycle. Note that students will have the opportunity to collect and observe live local organisms later in the unit. Examples of animals that are available to order for this purpose include the following:
 - snails
 - tadpoles
 - guppies
 - mealworms
 - salmon fry
 - caterpillars

Possible Misconceptions

- Depending on the animal you choose to observe in your class, students may or may not get to see the egg stage. If this stage is missing from the observed stages in the life cycle, be sure to draw out this fact through questioning and reinforce it by showing visuals of the complete life cycle for the animal students will be observing.

ACTIVATE

Read Aloud: *Alligator Baby*



Summary

Kristen's baby brother is accidentally born at the zoo instead of the hospital and when her parents repeatedly bring home the wrong infant, it's up to Kristen to find the "people baby" that is her new brother.

Before Reading

Tell students that you will be reading a humorous story about mixed-up newborn babies.

Set a purpose for listening by asking students to listen as you read and to pay close attention to the illustrations to predict the baby animals based on their appearance and actions.

During Reading

As you read, pause frequently to discuss the text and illustrations. Prompts for discussion could include:

After page 4:

- **Kristen sees a long green tail, a green claw, and a long green face with lots of teeth.**
- **What baby animal is Kristen's mother holding?**

Invite students to share their prediction with a partner.

After page 6:

- **Was your prediction supported?**
- **Do you know what a baby alligator is called?** (hatchling)

After page 9:

- **Why do you think Kristen put the hatching in the fish tank?** (as soon as they are born, hatchlings go into the water; they can catch their own food immediately)
- **How big do you think the hatchling is? Would it fit in a fish tank?**

After page 11: (Don't reveal the picture until after discussion.)

- **What did Kristen see?** (a fishy tail, a flipper, and a face with whiskers)
- **What baby animal is Kristen's mother holding?**

Invite students to share their prediction with a partner.

After page 13:

- **Was your prediction supported?**
- **Do you know what a baby seal is called?** (pup)
- **Why do you think Kristen put the pup in the bathtub? Why didn't she put it in the fish tank, too?** (seal pups can swim at birth; it is too large to fit in the fish tank)

After page 14:

- **What baby animal do you think Kristen's mother is holding? How do you know?**

Invite students to share their prediction with a partner.

After page 16:

- **Was your prediction supported?**
- **What do you think a baby gorilla is called?** (infant, just like a human newborn baby)
- **Why might Kristen's mother and father put the infant gorilla on the chandelier?** (newborn gorillas cling with their hands and feet, and like to climb)

After page 19:

- **What is the "waaa, waaa" sound that Kristen hears?**

After page 26:

- **What do you think is going to happen next?**

Revisit the pictures on pages 28–29, and 30:

- **How are the baby animals similar to their adult parents? How are they different?**
- **What life cycle stages do you think come after the baby stage for each animal?**
- **How do you think the animals will change as they grow?**

After Reading

Invite students to work in pairs or small groups to research and diagram the life cycle of an alligator, gorilla, or seal. Students can create a poster or digital slideshow featuring the life cycle of the animal along with some facts about how the animal changes during its life cycle (e.g., size, appearance, movement, diet).

Artifact Box

Assemble an artifact box with clues about the animal the class will observe. What artifacts you include will depend on what animal you plan to study in the classroom. For example, if you plan to observe mealworms, which are the larva stage of darkling beetles, your artifact box could include the following clues:

- a clear bag of oatmeal (food for the mealworm)
- a gummy worm (as a hint for the shape and name; note that mealworms are not actually worms but larvae)
- a bird feather or toy lizard (mealworms can be food for pet birds and lizards)
- a toy beetle or a beetle brooch (to clue the darkling beetle)

Show students the objects one at a time. Ask:

- **How would you describe this item?**
- **What is it?**
- **What things do you associate with this item?**

Focus on allowing students to practise their observation skills. When you have revealed all of the objects, ask:

- **How do you think all of these items could be connected?**

Allow students to provide ideas, and then reveal the connection.

CONNECT



Investigate a Life Cycle

Tell students that you will be setting up a habitat for live animals for students to observe. Show students Science Card 3 and discuss what is involved in observing live animals over a period of time. (Images include adult darkling beetles, painted lady caterpillar, tadpoles, mealworms, a bird's nest, a fish aquarium, and a magnifying lens.) Prompts for discussion could include:

- **How will we keep the animals safe and healthy?**
- **How will we feed the animals?**
- **What do you think we will observe?**
- **How often should we observe the animals?**
- **How will we record our observations?**



Record questions that arise on the I Wonder Wall.

As a class, set up the habitat for the animals according to any instructions provided by the supplier of the animals.

Each day, have students observe the animals. You may wish to set up a camera to monitor animals overnight or over a weekend. Remind students to record what they observe about the size, appearance, movement, and diet of the animals. Add these terms to the Word Wall. Students should note what changes they are seeing from day to day. They can record their observations by writing and making labelled drawings in their Science Journals, and/or by taking digital pictures and short videos. Students can measure the size of the larger animals by comparison with non-standard units such as paper clips or interlocking cubes. Challenge students to estimate the number of non-standard units before taking the actual measurement.

As a class, maintain a chart to track what is happening with the animals. For example, if students are observing multiple butterfly eggs, the class can use a chart to track when each egg becomes a caterpillar, and each subsequent change. Prompt students to make predictions about what they will observe next and when the next change will occur.

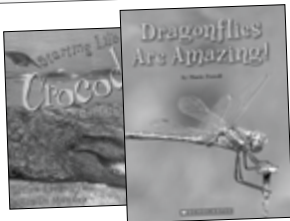
Life Cycle Tag

Play “life cycle tag” to model the changing movements of the animal that students are observing. For example, if the class is studying butterflies, students would begin by crouching down like little eggs. When they are tagged by “It,” they transform into wiggling caterpillars. When they are tagged again, they become chrysalises standing still with their arms wrapped around themselves. Finally, they become butterflies, running and flapping their wings. (The game can be extended to represent the life cycles of other animals such as frogs.)

Alternatively, students begin in the same way, but then seek another student in the same life cycle stage and play “rock-paper-scissors.” The winner moves to the next stage; the other remains in the same stage. (When only a single student is left in a given stage, that student moves to the next one.)

Time-Lapse Video Predicting

Show students time-lapse videos of life cycles. Pause the videos and allow students to predict what will happen next. Discuss the predictions before watching the video to see what happens.



Literacy Place Connection:

Read or revisit *Starting Life: Crocodile* by Claire Llewellyn and Simon Mendez and *Dragonflies Are Amazing!* (Guided Reading, Level O, pages 10–15). Discuss each life cycle with students. Review the dragonfly life cycle diagram then work with students to diagram the crocodile’s life cycle.

CONSOLIDATE

Modelling a Life Cycle

Provide craft supplies including modelling clay, paint, paper, and glue. Have students plan and then create a model of the life cycle of the animal observed in class using the medium or media of their choice (e.g., clay, paint, or collage). If you wish, divide students into small groups and assign each person within the group a stage to model. Within groups, the students should all use the same medium and plan for how they will present their models together to represent the life cycle.

Life Cycle Video

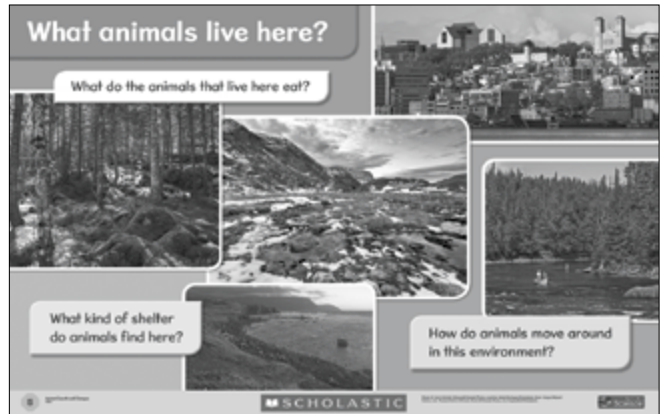
Using the photos and video clips collected over the life cycle of the observed animals, students can produce brief documentaries about the life cycle of the animal.

EXPLORE MORE

Exotic Pets

Some people like to keep unusual pets, such as monkeys or large snakes. Sometimes people acquire animals early in their life cycles, when they are cute and small, and then do not want them or become unable to handle them once they become adults. Provide students with links to find out rules about which animals can be legally kept as pets and which cannot. Students should consider why these rules are in place and why it is difficult to create a suitable human-made environment in the home for certain “exotic pets.” Consider sharing articles about illegal exotic pets being found in peoples’ homes. If students need more support, you may choose to conduct this research as a class and share the findings.

What Do Animals Need From Their Environments?



Focus: Students explore animals in their natural environment and observe how the animals eat, drink, move, and seek shelter. They apply this learning to requirements for human-made habitats.

Specific Curriculum Outcomes

Students will be expected to:

- 42.0 describe features of natural and human-made environments that support the health and growth of some animals [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe the features of the natural environment that meet the needs of an animal
- design a human-made environment to meet the needs of an animal, based on the features of its natural environment

NOTES:

Attitude Outcome Statements

Encourage students to:

- appreciate the importance of accuracy [GCO 4]
- be open-minded in their explorations [GCO 4]

Cross-Curricular Connections

Social Studies

Students will be expected to:

- describe how people's interactions with their environment have changed over time [2.4.2]

Art

Students will be expected to:

- create art for a variety of purposes and recognize there are many kinds of visual art [2.3.1]
- demonstrate positive interactive skills through collaborative art making [2.3.3]

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]
- 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 4 • Science Card 5 • IWB Activity 2 • <i>What Is the Inquiry Process?</i> poster Literacy Place: • <i>We Are Wolves</i> (Read Aloud—Analyzing Strategy Unit)	• one large, clear, wide-mouthed jar for each student or small group of students • cheesecloth or paper towel and elastics • students' Science Journals • students' Science Folders • a wide variety of construction materials and tools such as construction paper, cardboard, cardboard boxes, newspaper, crayons, markers, paint, scissors, glue, tape, string, craft sticks, pipe cleaners, cardboard tubes, felt, modelling clay, papier mâché, foam balls, cloth, aluminum trays, paper towel rolls	• Have available the list of local animals generated earlier in the unit. • Arrange for a class visit or visits by a wildlife officer or farmer and/or by an Elder or Indigenous Knowledge Keeper. • Scout a nearby location outdoors where students will be able to find insects and other small animals.	• basic needs • habitat • environment • evidence

Safety

- Remind students to wash their hands after touching animals.

Science Background

- Students have learned about the needs of living things in Science 1. In Science 2 they extend their knowledge and explore the interactions of animals and their environments, focusing on how the environment supports their needs and how human-made environments can support animal needs.
- The basic needs that all living things share are food, water, air, and shelter.

Possible Misconceptions

- Basic survival needs are food, water, air, and shelter, but that is not all animals need if they are to thrive. For example, an animal such as a dog that is given adequate food and water but is kept in a small cage is having all its basic needs met but is not likely to do well. Beyond survival needs, the dog has specific needs that must be met for it to thrive, such as companionship, exercise, and the opportunity to play.

ACTIVATE



River Otters and Their Environment

Show students Science Card 4. Ask:

- **What do you know about river otters?**
- **What do river otters need to survive?**

As students examine the Science Card for clues and provide answers, write each need on the IWB or on chart paper. Otters need the following:

- River otters need food. (They eat up to one-fifth of their body weight each day. They eat aquatic animals such as crayfish, crabs, fish, and frogs.)
- River otters need fresh water to get their food from and to drink.
- River otters need shelter—a place on land to sleep. (They sleep in dens that they make or in sheltered spots that they find.)

In the wild, an animal's habitat must support all its needs. For each need, have students consider the following:

- **How does the habitat of a river otter allow it to meet its needs in the wild?**
- **How could a human-made habitat support the needs of river otters?**
- **What is different about how river otters' needs are met in the wild and in human-made environments? What is the same?**

Write students' ideas for how the otters' needs are met on sticky notes and place the sticky notes with the appropriate category on the board.



Animal Habitats

Write the names of these habitats on the board: Arctic, ocean and coastlines, forest, freshwater, and city or town. Tell students that the habitat of an animal is the place where an animal naturally lives and grows. Show the students Science Card 5 and ask:

- **Can you identify each habitat?**
- **Which animals do you think live in each habitat?**

For example:

Arctic: Arctic fox, Arctic hare, Arctic tern, Arctic wolf, caribou, lemming, snowy owls, vole, wolverine, and a variety of insects including beetle, butterfly, fly, mosquito, moth, and spider

ocean and coastline: Atlantic cod, barnacle, cormorant, crab, conner, dolphin, haddock, halibut, lobster, narwhal, mussel, porpoise, puffin, sandpiper, sculpin, sea anemone, sea star, sea turtle, seagull, seal, shark, walrus, whale

forest: American toad, black bear, chipmunk, coyote, gray jay, great horned owl, little brown bat, lynx, moose, pine marten, red fox, red squirrel, spruce grouse, and a wide variety of insects

freshwater: Arctic char, beaver, common merganser, lake trout, northern green frog, northern pike, river otter, and a wide variety of insects including water strider and dragonfly

city or town: mouse, pigeon, rat, seagull, wide variety of insects — students could also mention pets living in houses and fed by humans (budgie, cat, dog, guinea pig, tropical fish, etc.)

Write students' answers on sticky notes and place them with each habitat. Choose some of the animals and ask for each:

- **What does it find to eat in this habitat?**
- **What shelter does it find here?**
- **How does it move around in its environment?**



Invite students to add any new questions to the I Wonder Wall.



Literacy Place Connection:

Read or revisit *We Are Wolves* by Molly Grooms and Lucia Guarnotta. Ask:

- **How does their habitat support the wolves?**
- **What do you think they eat?**
- **Does the habitat provide them with something to drink?**
- **How do the wolves move? Do you think the habitat provides them with enough room to move?**
- **What shelter do the wolves have?**



Visit a Natural Environment

Visit a local natural environment such as a pond, marsh, bog, forest, or beach or other shoreline. Have students use a T-chart to make two lists: evidence of animals living there (including sightings of the animals themselves), and features of the environment. Before going outside, brainstorm with students some ideas of what they could be looking for as ‘evidence.’

On returning to the classroom, create lists to consolidate students’ observations. For each animal, ask:

- **What does this animal need to survive?**
- **What part or parts of the environment provide what the animal needs?**

Encourage students to ask questions. Add their questions to the I Wonder Wall.

Visit a Human-Made Environment for Animals

Arrange to visit a nature park, farm, insectarium, aquarium, or aquaculture farm that has animals that could also live in the wild. (If a visit is not possible, show students videos of a wildlife sanctuary or zoo.) Prompts for discussion could include:

- **What do these animals need to survive?**
- **How would these animals satisfy these needs in the wild?**
- **How are these animals’ needs satisfied here, in this human-made environment?**



Encourage students to ask questions. Record any questions not answered during the visit and add them to the I Wonder Wall.

CONNECT

Classroom Habitat Drawings

Allow students time to carefully observe the habitat that has been set up in the classroom for the Investigate a Life Cycle activity (see *How Can We Observe a Life Cycle*, pages 16–22). Have each student draw a sketch with labels that shows how the classroom habitat meets the needs of the animals being observed. Ask:

- **How would the needs of these animals be met in the wild?**
- **Are there any needs that we cannot meet in the classroom?**
- **How could we improve the ways we are meeting the animals’ needs?**

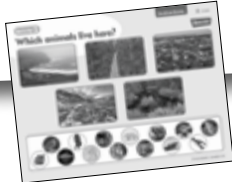
When students have finished their drawings, post them near where the habitat has been set up.

Class Visit

Arrange for a local wildlife officer or farmer to visit the class to talk about the needs of animals in their natural or human-made environments, and how changes to or deficiencies in those environments can endanger the animals. The visiting expert can also talk about how the life cycles of various animals are supported in the environment they are discussing.

IWB Activity:

- Challenge students to
- sort animals into their
- appropriate habitats
- using Activity 2: *Which animals live here?* (see the Teacher's Website).



Invite an Elder or an Indigenous Knowledge Keeper to visit and discuss animals and their relationship to the land, as well as traditional ways to observe, respect, and interact with wild animals and the land. This person could discuss ways of using traditional knowledge about animal habitats and feeding behaviours to hunt or trap the animals.

Where Do I Live?

Around the room, place images of various environments (e.g., forests, oceans, beaches and shorelines, fields, bogs, lakes and rivers) with Velcro spots. Provide cut-out images of various animals (mounted on cardboard with Velcro backing) that would live in those environments. As a group, discuss the needs of each animal in turn and predict its environment. Students can then place the picture of each animal in its environment.

Release or Keep?

Once the class animal or animals have gone through their life cycle (for example, once butterflies have emerged from their chrysalises or frogs have developed from tadpoles), engage the class in a discussion about what to do next. Ask:

- **Should our class take care of these animals for the remainder of their lives?**

If the decision is yes, ask students:

- **What do the animals need to stay healthy?**
- **How can we provide for these needs?**

As a class, come up with a plan and let students participate in the care of the animals and the maintenance of their habitat.

If the decision is to release the animals, ask students:

- **What do the animals need to stay healthy?**
- **Where and when should we release the animals?**

For example, butterflies should be released in warm weather. If the school has a butterfly garden, this would be an ideal place for releasing them. Or, plant a butterfly garden as a class project. (Refer to the Explore More activity on page 31.) Caution: It is best not to release non-native species as they could harm the local environment.

Allow students to participate in the release of the animals. Take pictures of the release and print them. Students can then use them to make a display showing where the animals were released and what features of the environment make it suitable for those animals.

Create a Zoo in a Jar

Give each student or small group of students a wide-mouthed jar and a spoon and explain that you will be making a "zoo in a jar." Take students outside and have them look for small insects or other animals. After locating and observing one or more animals (e.g., an insect, snail, slug, carpenter ant, centipede,

carpenter, spider, or earthworm), each student should create a habitat in their jar using some of the animal's surrounding environment, such as soil, leaves, twigs, grass, and rocks. Students can use their spoons to collect an animal or animals and put them in the jar. Jars can be covered with cheesecloth or paper towel held over the jar with an elastic band. Before leaving the area, have students take notes and/or pictures to record details about the environment where their animal was found.



Have students bring their jars back to the classroom. There, they can observe the appearance and behaviour of the animals by making notes and sketches and by taking photographs and videos. Have students generate further questions to investigate about their animal and record these in their Science Journals.

The Zoo in a Jar can then be used for the Zoo in a Jar Inquiry activity that follows.

CONSOLIDATE



Zoo in a Jar Inquiry

Explain to students that they will be using the animals they collected to investigate the animals' needs and preferences regarding their environment. Review the stages of the *What Is the Inquiry Process?* poster with the students.

1. Ask a question. Make a plan.

Challenge students to ask questions about the animals that they can answer by using simple experiments that will not harm the animals. For example:

- What kind of food does the animal prefer?
- Does the animal prefer light or dark surfaces?
- What kind of light conditions does the animal prefer? (Dark, bright, or something in between?)
- Does the animal prefer wet, damp, or dry conditions?



Have students record the question they plan to investigate in their Science Journals. (Alternatively, assign each student a question.)

Students should plan how they will carry out their inquiry and make a list of materials they will need. For example, to investigate what light conditions their animal prefers, they could use a toilet paper roll to make a dark place to offer their animal. Each student should describe their plan to you and provide their list of materials. Ensure that the question is focused and that the plan is simple while showing care and respect for the animal.

Discuss with students any safety concerns associated with their plans.

2. Explore. Record your results.

Students should carry out their plan for investigating their question. Students should record their observations using words, sketches, digital cameras, and/or tablets. Students should keep their records in their Science Folders.



3. Think about the results. Make conclusions.

Once the investigation is finished, prompt students to look at the question they asked at the beginning of the investigation. Ask:

- **What did you find out about the needs or preferences of your animal?**
- **Based on your observations, how would you answer your question?**
- **How would you change the setup of your Zoo in a Jar based on what you learned?**

4. Share what you learned.

Have students make posters to show what they learned about their animal. For example, they might make a labelled sketch of an “ideal environment” for their animal. Set up a Gallery Walk so that students can view one another’s results along with their Zoo in a Jar.

After finishing the inquiry, students should return their animals and the other items in the jar to where they found them. Following the investigation, students can conduct additional research to find out more about the animal they observed, and what stage of its life cycle it was in. Encourage students to record any further questions generated on the I Wonder Wall.



A Model Environment

Divide the class into small groups. Assign each group a local animal. Ensure you choose animals from a variety of different habitats. Tell students that they will be building a model of that animal’s environment. Set out a variety of construction materials and tools and allow students to examine the materials before making their plans. The materials might include: construction paper, cardboard, cardboard boxes, newspaper, crayons, markers, paint, scissors, glue, tape, string, craft sticks, pipe cleaners, cardboard tubes, felt, modelling clay, papier mâché, foam balls, cloth, aluminum trays, paper towel rolls.

Provide references to allow students to learn about their animal’s environment. Have students make a sketch of their plan in their Science Journals. Once the plan is ready, they can select their materials and begin. Remind students to compare the model they are building to their sketch and any other references as they work.

When the models are complete, have each group present their model and describe how the different features of the environment support their assigned animal.



EXPLORE MORE

Human-Made Environments in Zoos

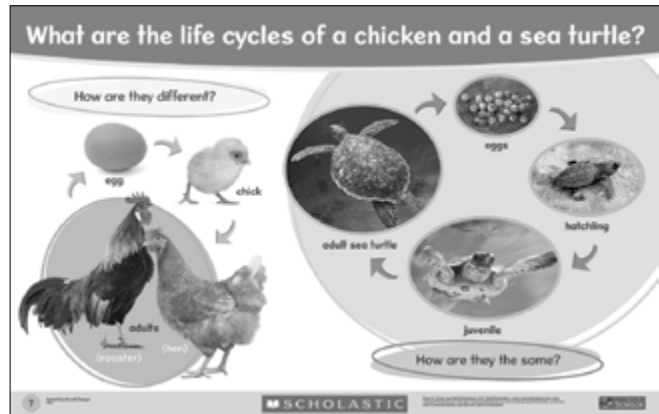
Have students generate questions about zoos or other human-made environments and record them in their Science Journals. Students can then use books, magazines, or the Internet to answer their questions. For example, students may research pros and cons of zoos, or describe the techniques zoos use to provide environments for animals that come from different environments all over the world.



Plan (and Plant!) a Pollinator Garden

Challenge students to find out what plants attract and support bees, butterflies, and other pollinators in the various stages of their life cycles. Students should then find out which of these plants are suitable for growing locally, and tour the school grounds to locate a place where a pollinator garden could be planted. Then they can make a plan for planting the garden. If possible, carry out the plan as a class project.

What Are the Life Cycles of Different Animals?



Focus: Students investigate the various stages of the life cycles of different animals.

Specific Curriculum Outcomes

Students will be expected to:

- 43.0 compare the life cycles of various animals [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- communicate the similarities and differences of familiar animal life cycles

NOTES:

Attitude Outcome Statements

Encourage students to:

- show interest in and curiosity about objects and events within their 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]
- 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 6 • Science Card 7 • Science Card 2 (optional) • IWB Activity 3 • IWB Activity 4 • IWB Activity 5 Literacy Place: • <i>Pictorial Diagram: Frog Life Cycle</i> (Conversation Card #14–Active Learning Kit) • <i>Who Laid These Eggs?</i> (Guided Reading, Level F)	• students' Science Journals • paper plates (2 per student) • paper fasteners (1 per student) • markers, colouring pencils, or crayons	• Collect posters, books, magazines and images showing life cycles of various animals. • Find videos showing the life cycles of various animals.	• fish • mammal • bird • reptile

Science Background

- Different classes of animals have different life cycles. Most classes of animals, including fish, mammals, reptiles, and birds, have fairly simple life cycles. First they are born, either alive from their mother or hatched from eggs. Then they grow and develop into adults. Amphibians and insects have more complicated life cycles. These animals undergo a metamorphosis (a significant change in their physical structure or habits).

There are two main types of metamorphosis: incomplete and complete. In incomplete metamorphosis, the offspring resemble the adult (e.g., the grasshopper nymph looks like an adult grasshopper except that it lacks wings). In complete metamorphosis, the offspring do not resemble the adult (e.g., the caterpillar and butterfly).

Characteristics of Different Life Cycles

Animal Class	Life Cycle Overview	Examples
insect	Some insects undergo complete metamorphosis. The stages are egg, larva, pupa, and adult.	bee, butterfly, ladybug, mosquito
	Other insects undergo incomplete metamorphosis. The stages are egg, nymph, and adult.	bedbug, dragonfly, grasshopper, lice
amphibian	Amphibians also undergo a metamorphosis. They lay their eggs in water. Larvae hatch and live underwater. They grow and develop into terrestrial adults that live and breathe on land.	frog, salamander
mammal	Mammals are born alive. They grow and develop until they become adults.	bat, caribou, cat, cow, dog, harp seal, humpback whale, moose, pig, polar bear, porcupine, red fox, snowshoe hare, walrus, wolverine
fish	Fish deposit eggs (spawn). Fish hatch and then grow and develop into adults.	Arctic char, capelin, dogfish, haddock, halibut, lake trout, northern pike, rainbow trout, smelt, salmon, whitefish
bird	Birds lay eggs. The eggs hatch and the chicks grow and develop into adults.	American robin, black-capped chickadee, blue jay, Canada goose, chicken, junco, puffin, seagull, snowy owl, starling, tern
reptile	Most reptiles lay eggs. The eggs hatch and the young reptiles grow and develop into adults.	garter snake, painted turtle, sea turtle

Possible Misconceptions

- Students may not realize that all living things have their own characteristic life cycle. Ensure students understand that the life cycles they are learning about are just examples and that every animal has its own life cycle with its own particular features. Exposing students to as many examples as possible will help with this. Students will further explore specifics of different life cycles as part of the Teaching Plan *How Do Different Life Cycles Compare?* (see pages 38–43).

ACTIVATE

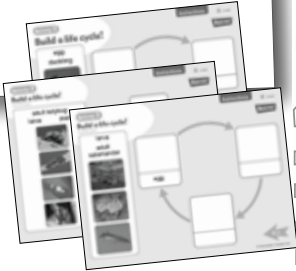


Looking at Life Cycles

Display one or more of the life cycle Science Cards (Science Cards 6, 7, and 2). Talk through the stages of each life cycle, modelling the appropriate vocabulary for the stages as shown on the cards. Record students' questions about the life cycles on the I Wonder Wall. Ask students to point out similarities and differences. The life cycles shown on each card are summarized in the following chart.



- IWB Activity:**
- Have students build life cycles for a duck, a ladybug, and a salamander using Activity 3: *Build a life cycle* (see the Teacher's Website).



Science Card	Animal	Class of animal	Stages of life cycle
6	dog	mammal	- puppy - adolescent - adult dog
	salmon	fish	- egg - alevin - fry - fingerling - adult salmon
7	chicken	bird	- egg - chick - adult chicken (rooster or hen)
	sea turtle	reptile	- egg - hatchling - juvenile - adult turtle
2	butterfly	insect	- egg - caterpillar (larva) - chrysalis (pupa) - adult butterfly
	dragonfly	insect	- egg - nymph (larva) - adult dragonfly



Literacy Place Connection:

Display *Pictorial Diagram: Frog Life Cycle* (Conversation Card #14) and explain that frogs are amphibians which live both on land and in the water. Challenge students to identify each stage of the frog's life cycle (egg; tadpole; tadpole with legs; froglet; adult frog). Have students record the names of the stages on sticky notes and attach each label to the correct stage of the life cycle on the card. Ask:

- How does the frog's life cycle compare to the life cycles of other animals?

CONNECT

Expert Group Jigsaw Activity

Organize students into "home base" groups with 4–6 students each. (Make the group sizes as similar as possible.) Assign each member of the group a number (e.g., 1–4 for a group of 4). The "home base" groups split up, and all of the like numbers assemble in new groups. Assign an animal to each numbered group and provide materials to learn about the life cycle of that animal. See the Science Background section on pages 33–34 for ideas about which animals to feature.



Once finished, have group members return to their own “home base” group and share what they have learned. Students should record what they have learned about the different animals in their Science Journals.

Life Cycle Museum

Set up stations around the classroom with posters, books, displays, images, and access to videos focusing on the life cycles of various animals. (Science Cards 6, 7, and 2 can be used here as well.) Include information about a variety of animals including insects, mammals, amphibians, fish, reptiles, and birds.

Allow students time to look at all the exhibits and think about the similarities and differences between the life cycles.

Organize students into pairs. Assign each pair of students a pair of life cycles to compare. Tell students they will be doing a think-pair-share about their pair of life cycles.

1. Think—Ask students:

- **What are some similarities and differences between the two life cycles?**

Allow students 1–3 minutes to think individually about that question.

2. Pair—Have students discuss their thoughts about the question for 2–5 minutes. Encourage students to ask one another questions about what they are saying.

3. Share—Have each pair share details of their discussions with the class. Record questions that come out of the discussion on the I Wonder Wall. Ask students if and how their ideas changed as a result of the discussion.



CONSOLIDATE

Venn Diagram

Provide students with a list of possible animals to compare, each from a different animal class (insect, amphibian, mammal, bird, reptile, fish). Refer to the Science Background section on pages 33–34 for some examples that students can choose from. Have students choose two animals from different classes and create a Venn diagram to compare the two animals and their life cycles.

Animal Life Cycle Wheel

Provide each student with two paper plates and a paper fastener. Tell students they will be producing a Life Cycle Wheel. Assign each student a local animal or allow them to choose their own. Students should research their animal’s life cycle and plan in their Science Journals how to draw the stages of the life cycle around the wheel (on one paper plate).

Once their plans are ready, they can draw their life cycle. Help students cut a window out of their second paper plate to show only one stage at a time of the life cycle. Students can decorate this second plate (the top plate) and



include the name of their animal. Help students attach the plates with the paper fastener to create a wheel that can be spun to show the stages in the life cycle of their animal.

IWB Activity:

Students can match adult birds with their chicks using Activity 4: *Whose chick?* (see the Teacher's Website).



Guess the Parent Game

Challenge students to make a “guess the parent” game in which they match animals at various stages of their life cycles with an adult parent. Students can create cards using their own sketches or by cutting out pictures from magazines and other sources, or produce the game using the Interactive Whiteboard or other programs.

IWB Activity:

Challenge students to match each butterfly or moth with its caterpillar using Activity 5: *Whose caterpillar?* (see the Teacher's Website).



Literacy Place Connection:

Read or revisit *Who Laid These Eggs?* (Guided Reading, Level F) and challenge students to predict which animal laid the eggs shown. Discuss the various animal life cycles.

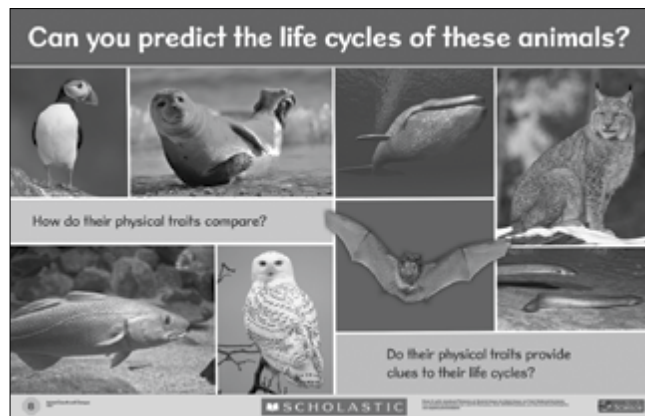


EXPLORE MORE

Life Cycles and Environments

Have groups of students create their own museum exhibits that show at least three different life cycles in a single environment (ocean, beach or shoreline, field, lake or river, bog or marsh, forest, farm). Students can use models, drawings, photos, videos, and other media to create their exhibits.

How Do Different Life Cycles Compare?



Focus: Students group and sort animals based on the similarities and differences between their life cycles.

Specific Curriculum Outcomes

Students will be expected to:

- 10.0 sequence or group materials and objects [GCO 2]
- 44.0 group animals according to the similarities and differences of their life cycles [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- accurately group and sequence animal life cycles using various characteristics

NOTES:

Attitude Outcome Statements

Encourage students to:

- consider their observations and their own ideas when drawing a conclusion [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- select, read, and view with understanding a range of literature, information, media, and visual text [GCO 4]
- respond personally to a range of texts [GCO 6]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 8 • IWB Activity 6 • BLM <i>Life Cycle Trivia Cards</i> Literacy Place: • <i>Flying Acrobats</i> (Guided Reading, Level M)	• images of a variety of animals • small toys representing animals • students' Science Journals • paper plates • drawing materials	• Collect small toys representing a variety of animals. • Collect and cut out images of different animals.	• exoskeleton

Science Background

- The more life cycles students are exposed to, the more they will notice the similarities among classes of animals. The previous Teaching Plan described common features of the life cycles of birds, mammals, reptiles, etc. Within classes, there is a great deal of variation, including in the length of time it takes for each stage of a life cycle and the overall lifespan of an animal. Questions about characteristics of life cycles make great questions for research. For example:

Question	Answer
Which animal has the longest lifespan?	The bowhead whale, also known as the Arctic whale, has the longest lifespan. These whales have an average lifespan of 200 years!
Which animal has the shortest lifespan?	Many sources report mayflies as having the shortest lifespan, although this only takes the adult (imago) stage of their life cycle into account. Mayflies live only one day. Some members of the mayfly family live only a few hours or even a few minutes.
How do the sizes of mammal mothers and their babies compare?	Human mothers weigh about 22 times as much as their babies. An Orca mother weighs about 50 times as much as its baby. A giant panda weighs 900 times as much as its baby!

Possible Misconceptions

- Students may use clues such as where an animal lives or whether or not it has wings to make inferences about their life cycles. For example, they may believe a bat lays eggs like a bird because it has wings. They may believe a whale lays eggs like a fish because it lives in the water. Allow students plenty of time for investigation and exploration of materials describing different life cycles to help them dispel such misconceptions. Reinforce the learning of the previous Teaching Plan and model the grouping of animals based on class (mammals, birds, fish, insects, amphibians, and reptiles) rather than individual characteristics (such as wings) or habitat. The Life Cycle Trivia game on pages 41–42 can help dispel some of these possible misconceptions.

ACTIVATE



Grouping Animals

Science Card 8 provides images of a variety of animals from three classes of animal: mammals (lynx, little brown bat, blue whale, seal), fish (American eel, cod), and birds (puffin, snowy owl). Show students the Science Card and ask:

- What are some ways to group these animals?
- How can you group them based on their body coverings? The way they move? Their environment? The things they eat? The number of legs they have?
- Do all animals with wings lay eggs?
- Do all animals that live in the water lay eggs?
- Do all animals with fur give birth to live young?
- Which animals are mammals? Birds? Fish? How do you know?
- Can you predict the life cycle of an animal by looking at its physical characteristics?



Record students' questions about grouping and life cycles on the I Wonder Wall.

Sequencing Life Cycle Stages

Gather images of animals in 3 or 4 stages of their life cycles. Ensure there will be one image per student. Pass out the images to students. They must first find the students with the other stages for their animal, and then sequence themselves based on the life cycle stages. Examples could be:

- honeybee: egg, larva, pupa, adult honeybee
- dragonfly: egg, nymph, dragonfly
- dog: puppy, adolescent, adult dog
- frog: egg, tadpole, froglet, frog
- chicken: egg, chick, chicken (hen or rooster)
- darkling beetle: egg, mealworm, pupa, darkling beetle

After the activity, invite students to display the images with appropriate labels.

CONNECT



IWB Activity:

- Challenge students to use Activity 6: *What animal am I?* (see the Teacher's Website) to predict the animals according to details about their life cycles.



Life Cycle Trivia Cards			
1. little brown bat	2. lice	3. monarch	4. ladybug
5. chicken	6. Atlantic salmon	7. darkling beetle	8. seagull
9. rainbow trout	10. human	11. walrus	12. hamster
13. green frog	14. grasshopper	15. woodpecker	16. dragonfly
17. sea turtle	18. dog	19. red Admiral butterfly	20. honeybee

Sorting Animals

Provide small groups of students with images or small toys representing different animals. Refer to *What Are the Life Cycles of Different Animals?* (see pages 32–37) for ideas about which animals to use. Have students work together to sort the animals based on their physical characteristics. Have students record their work by taking digital photos or by making lists or simple charts in their Science Journals.

Body Coverings

Ask students:

- Do animals that look similar always have the same kind of life cycle?

Record students' predictions. Provide paper plates and drawing materials. Tell students they will be creating sorting circles. Students should label each plate with four different types of body coverings (e.g., fur, feathers, scales, exoskeleton/shell). Introduce the term "exoskeleton" and add it to the Word Wall. Insects have hard body coverings called exoskeletons. Some of these are also called "shells."

Provide students with images or toys representing various animals, or a mixture of the two, and have them sort the animals into the sorting circles. Once sorting is complete, have students revisit the question asked at the beginning of the activity by comparing the life cycles of animals within the circles. You may repeat the activity with different characteristics of an animal such as its size, ability to fly, and habitat.

Life Cycle Trivia

Reproduce and cut out BLM *Life Cycle Trivia Cards*. Give each student a card. (Play the game with small groups if your class is large, or make extra cards.)

To begin, each student stands up in the order of the number on their card and introduces themselves as their animal. E.g., "I am a walrus!" "I am a rainbow trout!" All of the students should be standing up at the end of the introductions. During play, all students for whom the statement is not true should sit down and stay seated for the rest of the game. For example, the student with "human" should sit down after the first question because humans typically live longer than 30 years. After each question is asked, check in with each student who sat down and ask why they sat down.

Trivia Questions

- My life cycle is usually less than 30 years. (Human and walrus sits down.)
- My life cycle is usually less than 15 years. (Sea turtle sits down.)
- I begin life in an egg. (Little brown bat, hamster, and dog sit down.)
- I have wings. (Lice, Atlantic salmon, rainbow trout, and green frog sit down. Note that darkling beetles are flightless but do have wings.)
- I do not come out of my egg with wings but develop them later. (Chicken, seagull, and woodpecker sit down.)



6. I form a pupa (chrysalis) during my life cycle. (Grasshopper and dragonfly sit down.)
7. In my larva stage, the only food I eat is milkweed. (Mosquito, ladybug, darkling beetle, and honeybee sit down.)

The red admiral butterfly is the last animal standing.

After the game, have students glue their card in their Science Journals. Have them find answers to the following questions about their animal:

- **How long is a typical life cycle for my animal?**
- **What are the stages of a life cycle for my animal?**
- **What interesting thing did I find out about my animal's life cycle?**
- **What else would I like to know about my animal's life cycle?**

CONSOLIDATE

Comparing Life Cycles

Tell students they will be playing a comparing game. Work with small groups and ask them questions comparing one life cycle with another. Have students justify their responses by describing the life cycles in the question and explaining why one is more like another. Sample questions:

- **Is a blue whale life cycle more like the life cycle of a dog or a salmon?**
- **Is a butterfly life cycle more like the life cycle of an eel or a little brown bat?**
- **Is a ladybug life cycle more like the life cycle of a dragonfly or butterfly?**

Have students ask one another similar questions.



Literacy Place Connection:

Flying Acrobats (Guided Reading, Level M) tells of a boy's experience with the hummingbirds in his neighbour's garden. Invite students to help you diagram the hummingbirds life cycle. Discuss which life cycles of other animals are similar to the hummingbird.

EXPLORE MORE

Jellyfish Life Cycle

Jellyfish have interesting and unusual life cycles. Challenge students to use books or the Internet to find out about the life cycle of a jellyfish and produce a poster to show what they have learned.

Lobster Life Cycle

Have students investigate and compare the life cycle of a lobster with the life cycles of a dragonfly and Atlantic salmon. Have them orally describe the similarities and differences in each case.

Life Cycle Trivia Cards

1. little brown bat	2. lice	3. mosquito	4. ladybug
5. chicken	6. Atlantic salmon	7. darkling beetle	8. seagull
9. rainbow trout	10. human	11. walrus	12. hamster
13. green frog	14. grasshopper	15. woodpecker	16. dragonfly
17. sea turtle	18. dog	19. red admiral butterfly	20. honeybee

How Do Traits Change as Animals Grow and Develop?



Focus: Students explore constant and changing traits in humans and other animals, with a focus on humans.

Specific Curriculum Outcomes

Students will be expected to:

- 45.0 analyze constant and changing traits in humans and other animals as they grow and develop [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- analyze a family photograph to identify traits that are changing and traits that are constant

NOTES:

Attitude Outcome Statements

Encourage students to:

- be sensitive to the needs of other people, other living things, and the local environment [GCO 4]

Cross-Curricular Connections

Social Studies

Students will be expected to:

- describe changes in their lives and their reactions to these changes [2.1.1]

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]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 9 • BLM <i>Constant and Changing Traits</i>	• small sticky notes • students' Science Journals • students' Science Folders	• Have students bring in baby pictures from home. Be sure to label them on the back. • Find time-lapse videos showing people aging over time. See <i>Additional Resources</i> on page 82 for some possible websites.	• constant trait • changing trait • inherit

Science Background

- In biology, a trait is a particular version of an inherited characteristic, such as brown eyes. (Note that “brown eyes” is the trait; “eye colour” is the characteristic.)
- The way in which traits change over time is determined by the genes of that individual. One person might grow to a maximum height of 1.5 m, while another reaches a height of 2.0 m. However, traits can also be affected by environmental conditions or by the intentional actions of that individual. For example, a person who does not receive sufficient nutrition may not grow to the same height as an adult as they would have otherwise. People change the way their hair looks by cutting it or colouring it, and can even change such things as the shape of their nose through plastic surgery. People may lose limbs or experience other physical changes due to accidents.
- Some traits are constant, while others change over time due to the development of the animal. Focusing on particular traits that change over time as animals—including humans—develop can help students analyze the ways that humans and other animals change as they develop and grow.

Possible Misconceptions

- Students may become confused about the ways in which traits can change (through natural development, through intentional modification, or by accident). Talk about all the different ways traits can change and tell students you will be focusing on traits changing through growth and development.

ACTIVATE



Human Traits Over Time

Show students Science Card 9 and ask:

- **What changes do you see as this baby grows up?**
- **What stays the same?**
- **How have you changed since you were a baby?**
- **In what ways have you stayed the same?**

Encourage detailed observation, focusing on different parts of the person's body, e.g., overall height, head size, facial features, hair length and colour, length of legs, etc. Questions that arise can be recorded on the I Wonder Wall.

Through this discussion, introduce the terms “constant trait” and “changing trait.” Add these terms to the Word Wall.

Time-Lapse Aging

There are a number of time-lapse videos available on the Internet showing people aging over time. (These videos have been created by putting together photos taken every day, or at some other regular interval, over a period of years.) Some of these show a child aging from an infant to a grade-schooler, for example.

Show one of these videos to the students. Pause the images periodically and ask:

- **Which traits have changed?**
- **Which traits have stayed the same?**
- **What changes do you expect to observe as the video continues?**

Record students' observations and predictions. Have students compare their predictions to their observations as the video continues.

CONNECT



Baby Pictures

Have students bring in baby pictures of themselves. Put the photos up on a wall and label them with different letters on sticky notes. Give students time to examine the photos and to record their predictions about who each baby is in their Science Journals. After revealing the identities of the babies, select a few students to stand with their baby pictures and, as a class, discuss the unchanged (constant) and changed (changing) traits for each person. You might extend this activity by having members of the school staff bring in baby pictures.

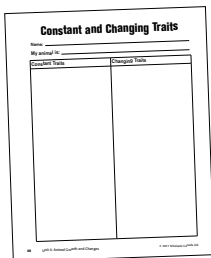
CONSOLIDATE

Kinesthetic Trait Game

Label one wall “constant traits” and one wall “changing traits.” Tell students that they should move to the appropriate wall to indicate whether the characteristic that you call out represents constant or changing traits for humans.

Characteristics you might use include:

- height
- number of eyes
- foot size
- hair colour
- head size
- eye colour
- leg length
- number of legs
- number of noses
- weight



Traits Table

Provide copies of BLM *Constant and Changing Traits* and assign each student an animal with a familiar life cycle. (Refer to *What Are the Life Cycles of Different Animals*, pages 32–37, for ideas.) Have students complete the chart for that animal to list its changing and constant traits. Students can share their charts with a partner. Remind students to store their completed BLMs in their Science Folders.

EXPLORE MORE

A Second Childhood

There is an Internet meme in which adults attempt to replicate their childhood photos by wearing the same clothing and posing in the same way. Before class, search for and download or bookmark examples of these for students to analyze on screen. In addition to being entertaining, these images, by showing people in the same positions and similar clothing as children and as adults, make it easier for students to see what has changed and what is different. Have student choose a set of two photos (child and adult) to print out and label with changing and unchanging traits. Or, challenge students to plan a brief presentation using several of these sets of pictures to show examples of constant and changing traits.

A Family Photo through Time

Four sisters—“the Brown sisters”—have been photographed every year since 1975 standing in similar poses. Help students view these images online and record the constant and changing traits they can observe. Suggest to students that they start a similar project at home with the participation of their own family. Students can bring in the first photo to share with the class and discuss how they plan to continue the project.

Constant and Changing Traits

Name: _____

My animal is: _____

Constant Traits	Changing Traits

How Do Humans Grow and Develop?



Focus: Students explore changes in physical and behavioural traits in humans as they grow and develop. These traits are compared to the development of other animals.

Specific Curriculum Outcomes

Students will be expected to:

- 14.0 communicate procedures and results [GCO 2]
- 19.0 select and use materials to carry out their own explorations and investigations [GCO 2]
- 40.0 pose new questions that arise from what was learned [GCO 2]
- 46.0 investigate changes in humans as they grow and develop [GCO 1/3]
- 47.0 compare human growth and development to that of other animals [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe characteristics of physical and behavioral traits of humans at various stages of development

NOTES:

Attitude Outcome Statements

Encourage students to:

- work with others in exploring and investigating [GCO 4]

Cross-Curricular Connections

Social Studies

Students will be expected to:

- describe changes in their lives and their reactions to these changes [2.1.1]

Math

It is expected that students will:

- construct and interpret concrete graphs and pictographs to solve problems [2SP2]
- compare and order objects by length, height, distance around, and mass using non-standard units and make statements of comparison [2SS3]
- gather and record data about self and others to answer questions [2SP1]

Art

Students will be expected to:

- create art for a variety of purposes and recognize there are many kinds of visual art [2.3.1]

English Language Arts

Students will be expected to:

- respond personally to a range of texts [GCO 6]
- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• <i>Our Love Grows</i> (Read Aloud) • Science Card 10 • IWB Activity 7 • <i>What Is the Inquiry Process?</i> poster • BLM <i>It's Better to Be...</i> Literacy Place: • <i>Whales</i> (Guided Reading, Level J)	• Velcro strips • large piece of felt • students' Science Folders • large sheets of paper and markers • construction paper • string • interlocking cubes • modelling clay	• Collect images of people at various ages. Ask students to bring in pictures of people from home. (Not precious family photographs.) Mount the images on Velcro squares. • Arrange for a visit from a mother and baby and/or an elderly person. • Arrange for a trip to a farm. • Arrange to partner with different classes for the Human Changes Inquiry activity.	• newborn • infant • baby • toddler • child • teenager • adult • elderly

Science Background

- To introduce students to the idea of behavioural changes, help students consider what people can do at different ages. Behavioural development in humans is most dramatic in the first few years of life, and detailed information is available on milestones parents can use to check their baby's development month by month. Milestone charts for the first year and beyond are readily available online. Here is a sample showing some of the developmental milestones for a child at 3 months, 8 months, and 18 months.

Selected Developmental Milestones

Age	Movement	Social Skills and Language	Learning and Thinking
At 3 months, most babies can...	- roll from front to back - raise head and chest when lying on stomach - bring hands to mouth	- copy body movements and facial expressions - smile when you smile and on their own	- watch faces closely - follow moving objects - recognize objects and people they know
At 8 months, most babies can...	- sit on their own - support whole weight on legs - control upper body - hold and shake a toy	- reach for a person they know - smile at self in mirror - copy speech sounds	- find a partially hidden object - try to get objects out of reach - watch a falling object
At 18 months, most babies can...	- walk without help - climb stairs one at a time with help - build a 3-block tower - use a spoon	- say 20 or more words - follow a simple instruction - point to a named body part	- use objects as tools - fit related objects together (e.g., use a shape sorter)

Source: Caring for Kids: Information for parents from Canada's paediatricians [http://www.caringforkids.cps.ca/handouts/your_childs_development]

Possible Misconceptions

- Students may believe that human development stops once people reach their maximum height in their teenage years. Use examples in the activities to show that people continue to change and develop in physical and behavioral ways throughout their life.

ACTIVATE

Read Aloud: *Our Love Grows*



Summary

A young panda named Pip asks, “Mama, when will I grow big?” Mama uses examples in nature to show that like the things around him, Pip will grow and so will her love for him.

Before Reading

Share a memory of when you weren't big enough to do something you wanted to do. For example, "I remember when I was very young, about 2 years old, and I tried to ride a tricycle but I could barely reach the pedals." Then share an example of how you've changed such as, "I've gotten much bigger since then. I've grown much too big to ride a tricycle."

Invite students to recall a time when they wanted to do something but weren't big enough to do it. Ask:

- **How big were you?**
- **Do you remember how old you were?**
- **How have you changed since then?**

Tell students that you're going to read a story about a young panda bear named Pip who wonders when he will grow big.

During Reading

As you read the story to students, pause frequently to discuss the text and illustrations, and to clarify any new concepts. Alternate by asking students to respond in a whole group or with a partner. Prompts for discussion could include:

After reading the first four pages:

- **When Pip asks when he will be big, Mama says, "You're bigger than you were before." What does she mean?** (Pip is growing and changing as he gets older, and he will continue to change with time.)

After reading the next two pages:

- **What is Mama comparing Pip with in this series of images?** (She's comparing Pip with a tree that has grown as it gets older.)
- **What else do you see in the images that show that Pip has grown?** (Pip's toy Birdy was almost as big as Pip in the first image but Pip is quite a bit bigger than Birdy in the final image.)

After reading the next four pages:

- **What is a paw print?** (an animal's footprint)
- **What does "every step was far to go?" suggest to you?** (When Pip was smaller, distances seemed much further away and it took longer to reach places because he took more, smaller steps.)
- **Do you remember a time when a distance felt greater than it does now?**

After reading the next two pages:

- **How does saying, "Birdy was all bright and new" indicate the passing of time?**
- **Look at the image. Does blanky [Pip's blanket] still cover all of Pip?**
- **How do you think Pip has changed over time?**

After reading the next two pages:

- **Which activities lasted longer when Pip was young than they would now? Why do you think they lasted longer?** (young children love to do things over and over again; sometimes young children miss seeing things that are obvious to older children)
- **What can Pip do better/faster now that he is bigger?** (find mama when they are playing hide and seek)

After reading the next two pages:

- **Why do you think “flowers blooming and petals falling,” and “pines cones tumbling down” indicate time passing?**

After reading the next two pages:

- **Would Pip still fit so snugly in Mama’s arms?**

After reading the rest of the book:

- **What else does Mama say has grown bigger over time?** (her love for Pip)

After Reading

Discuss with students the types of changes that take place in people as they develop and grow older. Prompts for discussion could include:

- **How else can someone change as they get older?**
- **What physical changes take place?** (e.g., hand and foot size, height, weight)
- **How do their behaviours or abilities change?** (e.g., learn to walk and talk; be able to do more difficult tasks such as learning how to kick a ball)

Simon Says

Tell students that you will be playing “Simon Says” with a twist. The twist is that the actions called out will be actions related to things humans do or learn to do at different stages of their development. (Recall that students should do the action you say only if you preface the action with “Simon Says....”)

Here are some actions you could use:

- crawl like a baby
- walk like a toddler
- walk with a cane
- rock a newborn baby
- eat like a baby
- play basketball
- play patty cake
- shake a rattle
- jump up and down
- high five a friend
- drink from a baby bottle
- write your name (with a pretend pen in the air)
- eat with a fork
- go swimming
- ride a bike



IWB Activity:

- Students can sequence photos of people according to age using Activity 7: *Youngest to oldest* (see the Teacher's Website).

After the game, write the following terms spaced out on the board: newborn, baby, toddler, child, teenager, adult, elderly adult. Ask students to recall actions from the game. As each action is mentioned, ask:

- **At what age do people do this action? (Or, at what age do people learn to do this action?)**
- **Are there ages when people can't or don't do this action? Why is that?**

Have students think of other actions that people do at some ages but not others. Show them Science Card 10 to prompt further ideas. Ask:

- **What ages are these people?**
- **What evidence do you have?**
- **What actions are they doing?**
- **Could these actions be done by people at all ages?**
- **What other actions could people do at these ages?**

Record actions next to the appropriate age-related term, building simple concept maps for each as you go. Record any questions students have on the I Wonder Wall.

Youngest to Oldest

Collect 20 or more images of people at various ages. Ask students to help by bringing in images. Be sure to include babies, young children, teens, middle-aged people, and elderly people. You can find suitable images on the Internet or in magazines. Mount the images on cardboard and add Velcro to the back. Mount a large piece of felt on the wall labelled “youngest” at one end and “oldest” at the other end.

Challenge a student or small group of students to put 5–10 of the images in order. Use a timer and allow 30 seconds per trial. After their time is up, have students explain why they ordered the images the way they did. Clues can involve both observable physical traits and what the person is doing or how they are behaving in the picture.

Human Babies and Animal Babies

Divide students into groups. Each group is assigned one animal other than humans. Provide time for groups to conduct research to find out the following:

- **How long does my animal take care of its babies, if at all?**
- **What does my animal do to take care of its babies?**

Come together as a class and have each group present their findings. Prompts for discussion could include:

- **How long do human parents take care of their children?**
- **Why is this necessary?**
- **What are the reasons for the different kinds of care different animals receive from their parents?**



Record any new questions on the I Wonder Wall.



Literacy Place Connection:

Read or revisit *Whales* (Guided Reading, Level J). After reading pages 4–11, ask:

- How is the development of whales similar to the development of humans?
- How is it different?

CONNECT

Class Visits

If your class is not already participating in the Roots of Empathy program, arrange for a one-time visit from a mother with a baby. Provide a large clean blanket for the baby to move around on. Students can sit in a circle around the blanket. The mother can talk about what it is like to take care of a baby, what the baby needs from her, and how the baby has changed since birth. She may choose to demonstrate changing a diaper or feeding the baby. Encourage students to observe the traits and behaviour of the baby and to ask questions.

Alternatively, or in addition, arrange for a visit from an elderly person, who can talk about some of the changes that happen with aging, and how he or she has coped with them. An Elder or an Indigenous Knowledge Keeper can talk about how a person's traditional roles and responsibilities change as they age.

Field Trip to a Farm

If possible, arrange for students to visit a farm where they can observe and compare baby and grown animals, such as chicks and chickens or lambs and sheep. After the visit, have students select one animal they observed and find out more about its growth and change throughout its life cycle. Students can then use a graphic organizer such as a T-chart to compare characteristics of the animal's growth and change to that of humans. Students can store their completed charts in their Science Folders.



Timeline

Have students bring in photos of themselves, siblings, friends, and parents at various ages. Arrange the photos on a timeline on which ages or stages (infant, baby, toddler, etc.) have been marked so students can observe how different people change physically and behaviourally over time. Code the photographs so students can tell which photos show the same person, for example by labelling each person with their own colour of sticker dot or with names written on sticky notes.

My Old Shoes

Ask students to bring in single outgrown shoes from home. (If they do not have any, they can instead bring in the shoe of a parent or younger or older sibling—the important thing is that the shoe be significantly larger or smaller than the shoes they currently wear.) Provide large sheets of paper and markers. Have students trace the outgrown shoe and a current shoe on the same piece of paper. They can label each shoe with the age at which they wear/wore it. Then have students measure the length of each shoe in interlocking cubes and label each tracing with its measurement.

Challenge students to use the data from this activity to predict how large their shoes will be in two years. Have them explain their reasoning. As an extension, consider making a concrete graph with the students to show the variety of *current* shoe sizes within the class. Give each student a shoe shape cut out of construction paper. Provide an x-axis on large paper labelled with the range of lengths (number of cubes) seen in the classroom. Students can then glue or tape their small shoe shape to the appropriate column to make a bar graph. Ask:

- Which is the most common shoe length in the class?
- Which is the least common?

This activity models for students the type of investigation they can do in the Human Changes Inquiry activity.

My Growth and Development: Revisited

Have students redo the measurements and photos they did at the beginning of the unit or year in the My Growth and Development activity (see pages 13–14). Have students make a poster to display how they have changed. These results may be used in the Human Changes Inquiry activity.



Human Changes Inquiry

Explain to students that they will be investigating how humans change. Review the *What Is the Inquiry Process?* poster with students and discuss each step.

1. Ask a question. Make a plan.

Provide a list of physical characteristics that students can measure. Tell students that they will need to collect measurements of this physical characteristic from their classmates, other students, friends, and family members. Characteristics that students might choose to measure include:

- head circumference
- leg length
- foot length
- hand size
- height

Help students frame a question to focus their inquiry. For example, “How does hand size change as people grow?” or “Are boys of the same age always taller than girls of the same age? (Or vice versa.)” “Are taller people always



older than shorter people?” Have students make a plan in their Science Journals to describe how they will measure their chosen characteristic. (For example, students can use yarn to measure and record head circumference or draw tracings of hands.) Help students focus their plans by asking:

- **What are you going to measure?**
- **How will you take your measurements?**
- **How many measurements will you take?**
- **How will you record your measurements?**

Students may plan to use data from the My Growth and Development activity (see pages 13–14).

Examine and discuss each student’s plan before proceeding.

2. Explore. Record your results.

Have students carry out their plan for investigating their question. If possible, partner with a kindergarten class and a class of older students to allow your students to gather data from them. Remind students to record the name and age of each person from whom they gather their data, and whether the person was male or female.

3. Think about the results. Make conclusions.

Help students draw meaning from their data. Ask students questions to help them think critically about the results they obtained. For example, suppose a student measured head circumference. You could ask:

- **What was the size of the the largest/smallest head (or hand, etc.) that you measured?**
- **What were the differences in head sizes between people of the same age?**
- **What was the difference between the smallest and largest head size?**

Students should make a concrete graph, table, or other graphic organizer to display their data in a way that addresses the question they asked. Help students write a conclusion that addresses their original question based on the data they gathered.

4. Share what you learned.

Help students decide how to communicate their data. For example, students could make a poster that displays their data using a graph, they could make a brief electronic slideshow to summarize their results, or they could prepare a brief booklet that describes their experiment.

CONSOLIDATE

Modelling Human vs. Animal Change

Set up a station with modelling clay. First assign each student a stage of human development (assign some students the baby stage, some the toddler stage, etc.). Have students make models of humans at their assigned stage. Display the models, showing the progression from youngest to oldest.

It's Better To Be...

Write _____

1. Circle one of the stages below. Next, write on the lines provided to complete the sentence: *It's better to be...*

Infant	Child	Adult
_____	_____	_____

2. Draw a picture of yourself at the stage you chose.

Next, have students choose an animal found in Newfoundland and Labrador to compare with human growth. Allow students time to gather any information they need about their chosen animal. Then have students use the clay to shape models to show the growth of that animal.

Once models are complete, students can use their models to tell how the growth of their chosen animal is similar to and different from the growth and development of humans.

As an extension, students could use their models to make a short stop-motion animation movie to demonstrate the movement of their animal or a human at one stage of development.

It's Better to Be...

Copy and hand out BLM *It's Better to Be...* Ask students:

- **Is it better to be a baby, a child, or an adult?**

Have students think about this question and complete the BLM in response, including a drawing of themselves at the age they chose. Encourage students to think about and comment on human physical and behavioral characteristics for that age. Students can share their completed BLM with a partner and explain their choices.

EXPLORE MORE

Helping People at Different Ages

Have students choose one of these questions to research by asking trusted adults:

- How do parents help their babies learn to sit, stand, and walk?
- What strategies can be used to help elderly people when it becomes more difficult for them to move around?
- How do young children learn challenging new skills such as skating, swimming, or riding a bike?

Alternatively, students can come up with their own question about how to help people at different ages. Have students record the responses they receive from their interviewees using video, and share the results with classmates.

It's Better To Be...

Name: _____

1. Circle one of the stages below. Next, write on the lines provided to complete the sentence.

It's better to be a...

baby	child	middle-aged adult
toddler	teenager	elderly person

because...

2. Draw a picture of yourself at the stage you chose.

Why Are Food Choices Important?



Focus: Students learn why making good choices about what to eat and drink is important to their growth and development.

Specific Curriculum Outcomes

Students will be expected to:

- 48.0 examine the implications of food choices and eating habits on human growth and development [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- communicate how making healthy food choices and healthy eating habits have a positive effect on human growth and development

NOTES:

Attitude Outcome Statements

Encourage students to:

- be sensitive to the needs of other people, other living things, and the local environment [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:

- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]
- 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 11 • BLM <i>Supermarket Scavenger Hunt</i> • IWB Activity 8 • BLM <i>Food Journal</i> • IWB Activity 9	• selection of food for artifact box • box • food magazines and grocery flyers • craft materials such as poster board, construction paper, markers, glue, scissors	• Collect food-related items for the Curiosity Centre. • Arrange for a field trip to a local supermarket. • Arrange for a visit from a dietitian. • Arrange for a visit from an Elder or an Indigenous Knowledge Keeper to discuss traditional ways of eating and cooking.	• Canada Food Guide • food groups • grains • dairy • allergy • diet

Safety

- Be aware of any allergies in the classroom and ensure no food is brought in that could endanger a student.
- Remind students to wash their hands before and after handling food.

Science Background

- Canada's Food Guide is based on current evidence about healthy eating. Detailed information about the Guide can be found by searching the Health Canada website. The following table summarizes the recommended number of Food Guide servings per day for children aged 4–8.

Recommended Number of Food Guide Servings per Day

Serving Type	Number of Recommended Servings (Children Aged 4–8)
Vegetables and fruit	5
Grain products	4
Milk and alternatives	2
Meat and alternatives	1
Oils and fats	30–45 mL

(Canada Food Guide, 2007)

- Health Canada also produced a companion guide that reflects the values, traditions, and food choices of Canada’s Indigenous peoples. This guide is called *Eating Well with Canada’s Food Guide: First Nations, Inuit, and Métis* and can also be accessed online.

Possible Misconceptions

- Not all foods with the same name are alike. If students have heard that “yogurt is healthy,” they may believe that all yogurt types are equally good choices. In fact, many flavoured yogurts have large amounts of sugar and are therefore less healthy choices than plain yogurt. Plain yogurt can be sweetened and flavoured with a little maple syrup and fruit and still be much healthier than store-bought flavoured yogurt.
- Students may not understand what is meant by a serving size. Consider bringing in some foods in pre-measured serving sizes. For example, a serving of vegetables and fruits is 125 mL of fresh, frozen, or canned vegetables or fruit, 125 mL of 100% juice, 250 mL of leafy raw vegetables, or 1 piece of fruit. (Further serving size examples are found on the Healthy Canada website.)

ACTIVATE

Artifact Box

Assemble an artifact box with a variety of foods—some of which support good health, and some of which do not. Try to include something from each food group. For example, your artifact box could include the following:

- leafy greens such as kale
- fruit such as an apple
- canned fish
- hard-cooked egg
- bag of grains such as quinoa
- container of yogurt
- candy
- chips
- soda

- water (in a reusable bottle)
- sports drink

As each item is produced, allow students time to make observations and ask questions. For each item, ask:

- **How would you describe this item? How does it look and smell?**
- **Have you eaten something like this? If so, how did it taste? How was it prepared? If not, would you like to try eating it? Why or why not?**
- **Is it healthy or unhealthy? Why?**



Display Science Card 11 and invite students to discuss the items shown. Ask:

- **Which food choices are healthier?**
- **What makes some food choices healthier than others?**

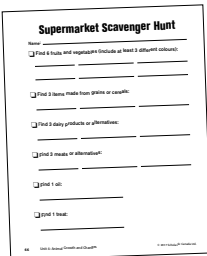
Invite students to create a healthy lunch menu from the items on the card.



Curiosity Centre

Collect books and (non-perishable) items that relate to food. Include cookbooks, a variety of menus from different restaurants, plastic food toys, and food magazines as well as items such as dry goods (beans, rice, and pasta in sealed containers) and canned goods (vegetables, fruits, fish, etc.). Allow students time for exploration. Encourage students to add questions that arise to the I Wonder Wall.

CONNECT

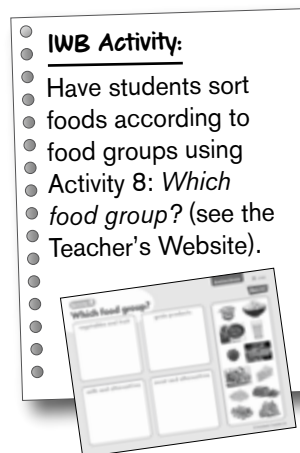


Supermarket Field Trip

If possible, take a trip to a local grocery store to observe a wide variety of foods from all food groups. Bring one or more devices that can take digital photos, and allow students to take turns photographing different types of food. Bring along copies of BLM *Supermarket Scavenger Hunt* and challenge students to find and check off all of the items. Alternatively, you could provide grocery store flyers. Remind students to store their completed BLMs in their Science Folders.

Back in the classroom, introduce the concept of the current Canada Food Guide. Display a copy of the food guide. Then show the photographs of the different foods that you photographed at the grocery store. Ask:

- **What food group does this food belong to?**
- **How do you know?**
- **What other foods did we find in this part of the supermarket? Were they from the same food group?**
- **Is this food healthy or unhealthy? Why?**





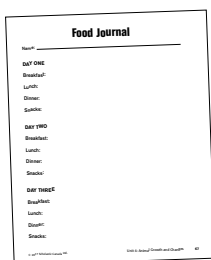
Visit from a Dietitian

Arrange for a dietitian or the school health nurse to visit the class and discuss the Canada Food Guide and how healthy eating—and unhealthy eating—can affect children’s growth and development. Consider collecting a few questions from the I Wonder Wall that the visitor might be able to help answer.



The Allergy Challenge

As a class, brainstorm different food allergies that people can have. Split the class into small groups and assign each group a different food allergy. Have each group decide on one person who will record information in their Science Journals. In their groups, students can brainstorm and list ways that students with food allergies can stay safe, and what kinds of foods they can eat to replace the foods that are off-limits for students with those food allergies. Students can then produce posters to display that information. (They may choose to use a T-chart or a different graphic organizer, such as a concept map with pictures.) Record questions that arise on the I Wonder Wall.



Food Journal

Have students keep a food journal for three days using copies of BLM *Food Journal*. Students can use words and pictures to record what they ate. At the end of the three days, set up a food journal Gallery Walk. Encourage students to ask questions about unfamiliar foods and to have an open attitude towards the food choices of others.

CONSOLIDATE



“Eat Well Diner” Menu

Set up a station with craft materials, including magazines and grocery flyers with pictures of food. Have students plan a lunch menu in their Science Journals for the “Eat Well Diner,” with different healthy food and drink options that include ingredients from the various food groups. Provide students with the option of creating a menu that would be appropriate for an Indigenous person. Invite students to come up with fun names for their menu items. Students can then use the craft materials to create colourful versions of the menus with menu item names, and brief descriptions that note the food groups included in each item.

Make a Poster for the Cafeteria

Challenge students to come up with ideas for healthy lunches that they could bring to school. Have them try to include at least one item from each food group in their lunch ideas. Students can then make “Healthy Lunch Idea” posters to put up in the school cafeteria.

Label a Bottle of Water

Have students make an illustrated label for their reusable water bottles listing reasons why water is important for healthy living.

IWB Activity:

- Challenge students to
- create a healthy lunch
- and to explain their
- choices using Activity
- 9: *What’s for lunch?*
- (see the Teacher’s
- Website).



Class Visit

Invite an Elder or an Indigenous Knowledge Keeper to the class to talk about traditional ways of eating and cooking using local plants and animals. Students can use what they have learned to describe a healthy meal including only items that can be found growing or living wild locally. This person could also discuss with the students why there is a guide especially for Indigenous peoples, and how Indigenous peoples' health has been affected by eating foods that are not part of their traditional diets.

EXPLORE MORE

A Commercial Break

In pairs or small groups, challenge students to plan and record brief (15 second) videos as advertisements for healthy food or drink items or categories, e.g.,

- water
- fruits (or a specific fruit)
- vegetables (or a specific vegetable)

Students could share their video with classmates and/or other classes in the school.

Supermarket Scavenger Hunt

Name: _____

☐ Find 6 fruits and vegetables (include at least 3 different colours):

_____	_____	_____
_____	_____	_____

☐ Find 3 items made from grains or cereals:

_____	_____	_____
-------	-------	-------

☐ Find 3 dairy products or alternatives:

_____	_____	_____
-------	-------	-------

☐ Find 3 meats or alternatives:

_____	_____	_____
-------	-------	-------

☐ Find 1 oil:

☐ Find 1 treat:

Food Journal

Name: _____

DAY ONE

Breakfast:

Lunch:

Dinner:

Snacks:

DAY TWO

Breakfast:

Lunch:

Dinner:

Snacks:

DAY THREE

Breakfast:

Lunch:

Dinner:

Snacks:

What Choices Can We Make to Stay Healthy?



Focus: Students learn how regular movement and other practices can help them stay healthy.

Specific Curriculum Outcomes

Students will be expected to:

- 31.0 respond to the ideas and actions of others and acknowledge their ideas and contributions [GCO 2]
- 49.0 examine the implications of actions and decisions that support a healthy lifestyle [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe how they can incorporate healthy lifestyle choices into their daily lives

NOTES:

Attitude Outcome Statements

Encourage students to:

- be sensitive to the needs of other people, other living things, and the local environment [GCO4]

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]
- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]
- 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 12 • BLM <i>My Favourite Way to Move</i>	• glitter • bar soap and water • liquid soap and water • plain water • dry paper towels • hand sanitizer • stopwatches • large graph paper • coloured sticky notes • students' Science Journals • students' Science Folders • variety of board games and card games • craft supplies such as poster board, markers, glue, scissors • dice • paper fasteners • modelling clay • small toys	• Arrange for an athlete with a disability to visit the class.	• germs • hygiene

Science Background

- Human growth and development can be affected by lifestyle. For example, insufficient food or not enough food of the right type can result in problems related to vitamin deficiencies, or even stunted growth. On the other hand, excessive food intake can result in obesity and connected health problems. A lifestyle that supports good health includes:
 - good hygiene
 - regular exercise
 - getting sufficient rest
 - drinking water and eating healthy food

Canadian Physical Activity Guidelines recommend at least 60 minutes per day of moderate- to vigorous-intensity physical activity each day. This recommendation is further broken down to suggest vigorous activities 3 days per week and bone- and muscle-strengthening activities at least 3 days per week. Moderate activities include bike riding and playground activities. Vigorous activities, such as running and swimming, cause children to feel “out of breath.” More information can be found on the ParticipACTION website.

Possible Misconceptions

- In connection with the focus on germs, students may develop or already have the misconception that all micro-organisms are harmful. Ensure students understand that this not true and in fact many micro-organisms are essential to human health. For example, beneficial bacteria in the gut help us break down food and can even help us fight harmful micro-organisms. Many healthy foods such as yogurt and kimchi contain helpful micro-organisms. Recent studies are finding that a robust diversity of micro-organisms in a person’s gut is linked to better health in multiple ways.

ACTIVATE

Good Morning Glitter!

Tell students you will be giving them a “glitter handshake.” Sprinkle a small amount of glitter on your hands. Shake hands with two or three students. Then allow students five minutes to shake hands with different classmates and touch various classroom items. After the five minutes has elapsed, have students examine their hands and classroom items. Count how many students have glitter on their hands and list the classroom items that now have glitter on them.

Ask students if they know what germs are. Tell students that germs are tiny living things that are too small to see. Not all such tiny living things are harmful—some of them are helpful!—but the ones we call “germs” are the ones that cause disease. If germs get into our bodies they can make us sick. Ask:

- **How is the glitter like germs?**
- **How is it different?**
- **How can you remove the glitter from your hands and from objects?**
- **How could we have stopped the glitter from spreading in the first place?**



Draw out the idea that washing hands is a good way to remove the glitter-germs and prevent their spread. Record questions about germs on the I Wonder Wall.

CONNECT

Get that Glitter!

This activity comes out of the Good Morning Glitter! activity. Tell students that they will be investigating the best way to remove glitter-germs from their hands. Ask:

- **How can we remove the glitter-germs from our hands?**

Allow time for brainstorming, and come up with at least five different ways the glitter-germs could be removed. For example, glitter-removal techniques could include the following:

- bar soap and water
- liquid soap and water
- plain water
- dry paper towels
- hand sanitizer

Ask students:

- **Which do you think will be the most effective method?**
- **Which do you think will be the least effective method?**

Record students' predictions. Next, set up stations according to the methods the class came up with. Divide the class into groups, assigning each group a different station. Provide a stopwatch or other timing device at each station. Before beginning, check that each student has about the same amount of glitter-germs on their hands. Add glitter as necessary to ensure an approximately equal distribution of glitter-germs. Ask:

- **For this investigation, why is it important that we all have about the same amount of glitter on our hands?**



Send students to their stations. Have each student try to remove their glitter using the method at their station. Another student should use the stopwatch to determine how long it takes. Students should record their results in their Science Journals.

After the investigation, collect and record results on a class chart. Compare the results with students' predictions. Ask:

- **Does this investigation tell us anything about removing real germs from our hands?**
- **How is removing real germs different from removing glitter-germs? How is it the same?**

Draw out the idea that when it comes to removing germs and preventing their spread, part of the goal is to kill the germs. This idea was not modelled in the investigation. Hand sanitizer works by killing germs. Soap kills and helps wash away germs. (Note that studies have shown that antibacterial hand soap is no more effective than regular soap at killing bacteria.) Make students aware that proper hand washing is the best way to prevent the spread of colds and flus.

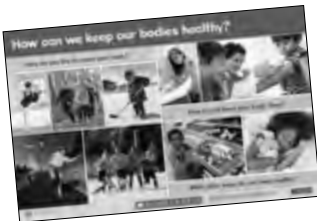
Record any questions that arise on the I Wonder Wall.



Healthy Lifestyle Brainstorming

Show students Science Card 12. Ask:

- **What activities do you see being done?**
- **How do these activities help keep you healthy?**
- **What kinds of sports do you like to play? What other ways do you like to move your body?**





- What other things do you do to keep healthy?
- What are some choices that might not be as healthy?

Discuss with students how different choices about activity, diet, and sleep can affect our health. As you talk, make a T-chart and record ideas about choices that are healthy and unhealthy. Record any questions that arise on the I Wonder Wall.

Participation Stations

Organize a series of games or activities in stations around the gym for students to try. Activities should be geared towards different goals. Examples could include:

- yoga moves for stretching muscles
- lifting and carrying objects for building muscle
- beam activities for developing balance
- throwing and catching activities for co-ordination
- skipping or jumping jacks for heart and lungs

Share the plan ahead of time with the students, and have them suggest ideas for additional or modified activities. Modify the plan based on this discussion. On the day, give students an “exercise passport” with a space for each activity. Stamp students’ passports or give them a sticker once they have completed each activity.

Class Activity Tracker

Set up a class activity bar graph to track the different ways students are active each day. Set up a large graph using one or more large pieces of graph paper. Write various activities on the y-axis, e.g., walking home from school, playing in the playground, dancing, playing soccer, tobogganing. Have students help you generate ideas for the activities. Ask students to predict which activity category they think will be most popular. Each day for a week, ask students which activity they did after school. Add a coloured sticky note to correspond to each row as appropriate. At the end of the week, revisit the predictions and discuss the results as a class.

CONSOLIDATE

Hey, Coach!

Tell students that they are going to become coaches. Have them make a week-long healthy living plan in their Science Journals with details about what to do on each day. Students should provide a plan for each day including what to eat, what exercises to do, and how much to sleep.

My Favourite Way to Move

Copy and distribute BLM *My Favourite Way to Move*. Have students use words and drawings to fill in the BLM, describing their favourite exercise and explaining why it is a healthy part of their lifestyle. Students can store their completed BLMs in their Science Folders.





Healthy Living Game

Set out a selection of board and card games for students to look at and play if time permits. Then provide a selection of craft supplies (be sure to include dice and/or paper fasteners to make spinners as well as small toys or modelling clay for game pieces) and tell students they will be making their own Healthy Living game. Students should plan their games first in their Science Journals. Tell students that their board games should:

- educate players about healthy and unhealthy choices
- reward healthy choices
- discourage unhealthy choices

After students are happy with their plan, they can make their game. When the games are finished, have students play one another's games and offer comments and suggestions for improvement using the "two stars and a wish" system. If time permits, students can modify their games based on this feedback.

EXPLORE MORE

Athletes in Training

Challenge students to choose a sport they are interested in, and then find out how athletes in that sport train to improve their skills, strength, and stamina in their sport while staying healthy.

Overcoming Challenges

Invite an athlete with a disability to speak to the class about how people with physical challenges can continue to be active, and to participate and excel in sports and other physical activities. Alternatively, students can investigate devices that have been invented to help animals with disabilities to remain mobile.

WRAPPING UP THE UNIT



Revisit the 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 how animals (including humans) grow and change.

My Favourite Way to Move

Name: _____

My favourite exercise is _____

I like it because _____

It is good for me because _____

Here is a picture of me doing my favourite exercise:

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
41.0 investigate changes in the appearance and activity of an animal as it goes through its life cycle [GCO 1/3]	
42.0 describe the features of natural and human-made environments that support the health and growth of some animals [GCO 1/3]	
43.0 compare the life cycles of various animals [GCO 1/3]	
44.0 group animals according to the similarities and differences of their life cycles [GCO 1/3]	
45.0 analyze constant and changing traits in humans and other animals as they grow and develop [GCO 1/3]	
46.0 investigate changes in humans as they grow and develop [GCO 1/3]	
47.0 compare human growth and development to that of other animals [GCO 1/3]	
48.0 examine the implications of food choices and eating habits on human growth and development [GCO 1/3]	
49.0 examine the implications of actions and decisions that support a healthy lifestyle [GCO 1/3]	
1.0 pose questions that lead to exploration and investigation [GCO 2]	
2.0 communicate using scientific terminology [GCO 2]	
6.0 predict based on an observed pattern [GCO 2]	
7.0 make and record observations and measurements [GCO 2]	
9.0 propose an answer to an initial question or problem and draw a simple conclusion [GCO 2]	
10.0 sequence or group materials and objects [GCO 2]	
14.0 communicate procedures and results [GCO 2]	
19.0 select and use materials to carry out their own explorations and investigations [GCO 2]	
30.0 identify and use a variety of sources of science information and ideas [GCO 2]	
31.0 respond to the ideas and actions of others and acknowledge their ideas and contributions [GCO 2]	
40.0 pose new questions that arise from what was learned [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				
• identifies and uses a variety of sources of information and ideas				
• follows safety procedures and rules				
Analyzing and Interpreting				
• sequences or groups materials and objects				
• constructs and labels concrete-object graphs or pictographs				
• 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 and acknowledges their ideas and contributions				

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 with prompting, constructs a concrete-object graph or pictograph 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 constructs a concrete-object graph or pictograph but title and labels may be missing or inappropriate 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 constructs a concrete-object graph or pictograph with appropriate title and labels 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 constructs a concrete-object graph or pictograph with appropriate title and labels to accurately reflect results 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 listens to others and learns from their observations	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 listens to others and learns from their observations, and draws on their language use	communicates with group members, sometimes with problems usually uses scientific terminology appropriately communicates most of the information about the result and procedures considers and responds to the ideas of others and learns from their observations and descriptions	communicates and works effectively with group members consistently uses scientific terminology appropriately accurately communicates the information about the result and procedures considers and responds to the ideas of others and applies the observations and descriptions to their own ideas and understandings

Additional Resources

Non-fiction Books

All about Frogs by Jim Arnosky (Scholastic, 2008)
Animal Families by Lorrie Mack (DK Publishing, 2008)
Baby Whales Drink Milk by Barbara Juster Esbensen (HarperCollins, 1994)
Butterflies by Nic Bishop (Scholastic, 2011)
Canada's Coastal Animals by Chelsea Donaldson (Scholastic, 2007)
Chickens Aren't the Only Ones by Ruth Heller (Puffin Books, 1999)
Creepy Crawly Baby Bugs by Sandra Markle (Walker Childrens, 2003)
Eating the Alphabet by Lois Ehlert (HMH Books for Young Readers, 1999)
From Tadpole to Frog by Wendy Pfeffer (Festival, 1994)
Lifetimes by Bryan Mellonie (Bantam, 1983)
Lizards by Nic Bishop (Scholastic, 2010)
Robins Grow Up by Violet Findley (Scholastic, 2012)
Spiders by Nic Bishop (Scholastic, 2014)

Picture Books

A Salmon for Simon by Betty Waterton (Groundwood Books, 1997)
An Extraordinary Egg by Leo Lionni (Scholastic, 1994)
Big Sarah's Little Boots by Paulette Bourgeois and Brenda Clark (Kids Can Press, 1987)
Fish is Fish by Leo Lionni (Scholastic, 1970)
From Caterpillar to Butterfly by Deborah Heiligman (Philomel Books, 1997)
How Big Is a Foot by Rolf Myller (Yearling, 1991)
Jim and the Beanstalk by Raymond Biggs (Puffin, 2002)
Love You Forever by Robert Munsch (Firefly Books, 1995)
Measuring Penny by Loreen Leedy (Square Fish, 2000)
Stellaluna by Janell Cannon (Scholastic, 1993)

Websites for Students

Animal Facts:
BrainPOP—Facts on a wide variety of animals (requires login)
<https://www.brainpop.com/science/diversityoflife/>
Canadian Geographic—Animal Facts
<http://www.canadiangeographic.ca/kids/animal-facts/animals.asp>
National Geographic Kids—Facts on mammals, reptiles, etc.
<http://kids.nationalgeographic.com/>

Websites for Teachers

Nutrition:

ChooseMyPlate—A US website with activities for kids about healthy eating
<http://www.choosemyplate.gov/kids>

TVO Kids—A game about keeping your body healthy
<http://www.tvokids.com/games/healthybody>

Animal Life Cycles:

CanTeach—Songs and poems about specific animals and life cycles
<http://www.canteach.ca/elementary/songspoems.html>

Monarch Life Cycle (YouTube)—A time lapse video showing the life cycle of a monarch butterfly
<https://www.youtube.com/watch?v=cAUSKxWMIh0>

Northern Leopard Frogs Life Cycle (YouTube)—A time lapse video showing tadpoles hatching from eggs over a period of five days
<https://www.youtube.com/watch?v=1y6614FsC4I>

River Otter Facts:

Newfoundland Labrador Department of Environment and Conservation—River otters
http://www.env.gov.nl.ca/env/snp/programs/education/animal_facts/mammals/otter.html

Human Growth and Development:

BuzzFeed—Recreated Childhood Photos
https://www.buzzfeed.com/jennaguillaume/hilariously-recreated-childhood-photos?utm_term=.mnJLkBEoq#.th9l9G8rq

Caring for Kids—Child development milestones
http://www.caringforkids.cps.ca/handouts/your_childs_development

New York Times—“Forty Portraits in Forty Years” (Portraits of the Brown sisters by Nicholas Nixon)
<http://www.nytimes.com/interactive/2014/10/03/magazine/01-brown-sisters-forty-years.html>

People in Order (YouTube)—A video showing people in order of age from 1 to 100
<https://www.youtube.com/watch?v=GUHLa1qSy24>

Roots of Empathy—A program that arranges for classes to partner with parents of new babies
<http://www.rootsofempathy.org/>

Time Lapse Lotte (YouTube)—We watch a girl age from birth to 12 years in less than 3 minutes
<https://www.youtube.com/watch?v=RtyqS68ViWk>

Health and Nutrition:

Health Canada—Canada Food Guide

<http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>

Health Canada— Eating Well with Canada’s Food Guide: First Nations, Inuit, and Métis

<http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/fnim-pnim/index-eng.php>

Health Canada—The Benefits of Hand Washing

<http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/hands-mains-eng.php>

The Global Public-Private Partnership for Handwashing—October 15, Global Handwashing Day

<http://globalhandwashing.org/global-handwashing-day/>

Dear parents and caregivers,

We are about to start a new unit in science in which we will be exploring animal growth and changes. Through a variety of hands-on activities and investigations, your child will be learning about the life cycles of various animals, including mammals, birds, fish, amphibians, reptiles, and insects.

You can talk to your child at home about his or her own growth and development. Look at family pictures together and talk about how your child has changed over time. Talk about how you cared for your child as a baby, and at what stages he or she learned to do different things such as eat independently, sit up, walk, talk, read, ride a bicycle, etc. If your child has a younger or older sibling at home, you can talk about physical differences, such as height and shoe size, and also talk about different things that the siblings are able to do because of their different ages.

You can plan some activities with your child to focus on growth and development, for example:

- If you have a dog (or other pet) that you acquired when it was a puppy, use photographs and memories to discuss the growth and change of your pet, including its physical characteristics and its behaviour.
- Look for examples of different stages of animal life cycles when out in nature, such as bird eggs, molting insects, or butterfly caterpillars or chrysalises.
- Begin (or continue) a growth chart in your home to record your child's height as he or she grows, along with the height of other family members.
- Ask an older relative such as a grandparent about the changes that happen with aging.
- Visit a friend or relative with a baby so your child can observe how babies look, how they behave, and what they need from their caregivers.

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,