Needs & Characteristics of Living Things

Science
Grade One

Carlene Walter
Curriculum Outcomes

Life Science: Needs and Characteristics of Living Things (LT)

**LT1.1**
Differentiate between living things according to observable characteristics, including appearance and behaviour. [CP, SI]

**LT1.2**
Analyze different ways in which plants, animals, and humans interact with various natural and constructed environments to meet their basic needs. [CP, DM, SI]

Indicators

Outcome: LT1.1
Differentiate between living things according to observable characteristics, including appearance and behaviour. [CP, SI]

a. Use a variety of sources of information and ideas (e.g., picture books including non-fiction texts, Elders, naturalists, videos, Internet sites, and personal observations) to learn about observable characteristics of living things.

b. Make and record observations and measurements about the observable characteristics of plants and animals using written language, pictures, and charts.

c. Group representations (e.g., photos, videos, drawings, and oral descriptions) of plants and animals according to various student-developed criteria.

d. Engage in personal, scientific, and Indigenous ways of organizing understanding of living things.

e. Describe characteristics common to humans (e.g., eyes, ears, hair, and numbers of limbs and teeth) and identify variations (e.g., eye colour, hair colour, skin colour, height, and weight) that make each human unique.

f. Compare observable characteristics (e.g., leaf, root, stem, flower, fruit, and seed) of plants of various types and sizes that live in different habitats.

g. Record information, using written language, pictures, and tables, about the appearance and behaviour of familiar animals, such as classroom or personal pets, at regular intervals over a specific time interval.

h. Describe the appearance and behaviour (e.g., method of movement, social grouping, diet, body covering, habitat, and nocturnal vs. diurnal orientation)
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of familiar animals (e.g., bumblebee, worm, dog, cat, snake, owl, fish, ant, beaver, rabbit, and horse).

i. Differentiate among animals according to their observable characteristics.

j. Compare characteristics of plants and animals at different stages of their lives (e.g., compare an adult dog with a pup, compare a young tree with an older established tree, and compare a baby bird with a fully grown bird).

k. Communicate knowledge (e.g., share a story, describe an experience, or draw a picture) about the observable characteristics of a favourite plant or animal.

l. Respond positively to others’ questions and ideas about the observable characteristics of living things.

m. Recognize that some information about living things may not be realistic (e.g., stories such as The Three Little Pigs, and talking movie animals).

Outcome: LT1.2

Analyze different ways in which plants, animals, and humans interact with various natural and constructed environments to meet their basic needs. [CP, DM, SI]

a. Identify the physical needs, (i.e., food, water, air, and shelter) that plants, animals, and humans require for survival.

b. Pose questions about ways in which plants interact with their environments to meet their basic needs (e.g., How long does it take a seed to start to grow? How does the growth of a plant change if the seed is planted in soil, sand, or rocks? How tall will a bean plant grow?).

c. Pose questions about ways in which animals interact with their environments to meet their basic needs (e.g., How does a bird move from one tree to another? Where do animals go at night or during the day? How do animals escape from predators?).

d. Investigate, through field trips to natural habitats, nature videos, and community walks, homes and habitats of local plants and animals to determine how they meet their basic needs.

e. Compare ways in which plants and animals that live within the local environment, and plants and animals that live in other environments, meet their needs for food, water, and shelter.

f. Compare the kinds of food that different animals eat, their methods of eating (e.g., cracking, tearing, strangling, chewing, or swallowing whole), and the structures that they have for eating.

g. Explore the challenges that plants, animals, and humans encounter when attempting to meet their basic needs in constructed environments (e.g., lawn, sports field, street, playground, and city).

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h. Discuss the need for caution when dealing with plants and animals (e.g., students may be allergic to a plant or animal, an animal may bite, and many common household plants are poisonous if ingested).

i. Compare basic human needs to the needs of plants, other animals, and non-living things.

j. Predict and model how certain animals will move (e.g., fly, run, swim, slither, walk, and swing) to meet their needs for food, shelter, and protection in their environment, based on personal observations, pictures, or videos.

k. Explore how people demonstrate respect for living things by caring for domestic plants and animals (e.g., growing a plant, hatching eggs, and keeping a pet).
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Essential Question
How are living things interconnected?

Tertiary Questions
1. What are the similarities and differences in the characteristics of living things?
2. How does asking questions help us better understand text, questioning allows us to seek out information, solve problems, and extend our understanding?
3. How do the needs and characteristics of living things change within the different stages of their life cycle?
4. How do the different methods of organizing things, including Indigenous and scientific methods, increase understanding of living things?
5. How do living things interact with various natural and constructed environments to meet their needs?
6. What challenges do living things face in obtaining their needs?

Learning Contexts

Scientific Inquiry
- Identify the key scientific concepts, principles, laws, and theories related to this outcome.
- Reflects an emphasis on understanding the natural and constructed world using systematic empirical processes that lead to the formation of theories that explain observed events and that facilitate prediction.

Technological Problem-Solving
- Identify human and social needs related to this outcome that could be solved by constructing a prototype of a technology.
- Reflects an emphasis on addressing human and social needs by designing and building to solve practical problems.

STSE Decision Making
- Identify key issues related to this outcome and determine potential stakeholders.
- Reflects the need to engage citizens in thinking about human and world issues through a scientific lens in order to inform and empower decision-making by individuals, communities, and society.

Cultural Perspectives
- Identify knowledge and ways of knowing related to this outcome that represent First Nations and Métis or other cultures.
- Reflects a humanistic perspective that views teaching and learning as cultural transmission and acquisition.
Inquiry

Inquiry learning is not a step-by-step process, but rather a cyclical process, with various phases of the process being revisited and rethought as a result of students' discoveries, insights, and co-construction of new knowledge. Questions for deeper understanding are used to initiate and guide the inquiry and give students direction for developing deep understandings about a topic or issue under study (ELA Curriculum, 2009).

Inquiry, as outlined in *Comprehension and Collaboration* (Harvey & Daniels, 2009), follow a four-stage model: Immerse, Investigate, Coalesce, and Go Public. Although these four stages appear linear, the authors urge teachers to view them as a spiral, because learners go back and forth between them throughout a given exploration. Modelling, guided practice, collaborative practice, independent practice, and application, are used throughout the unit to explicitly teach and coach students through a variety of collaboration, comprehension, and inquiry skills.

Immerse – 10 minutes

The initial stage, “Immerse,” is a time to build wonderment and background knowledge.

- Set the purpose of the context or the purpose
  - Comprehension strategy
  - Explicit modelling
  - Exploration of essential question
- Connect to the whole; this is a comment rather than an elaborate connection

Investigate/Reading and Collaboration – 20 minutes

Stage two, “Investigate,” is the students’ opportunity to develop their understanding of stated concept. According to the authors, students develop initial questions, search for information, and deepen their learning.

- Read independently or in group
- Discuss – purposeful discussion based on the context set in Set The Stage – often includes essential question

Coalesce/Individual Reflection – 15 minutes

The next stage, “Coalesce”, involves summarizing and synthesizing information, as well as the construction of new knowledge. Students also reflect on their learning and their methods for monitoring comprehension.

- Often written, but not exclusive

Group Synthesis – 5 minutes

Lastly, students “Go Public,” or share their learning in some way. This may include presenting findings to peers, the community, or a larger global audience.

- Share thoughts, revelations that relate to context.
- Relate to the bigger question
Expository Nonfiction and Asking Questions

Nonfiction readers respond to, and ask questions of, what they learn. Readers need to think and talk about the text they are reading. This may start by simply encouraging them to comment on the text as they read, such as “That’s interesting”, or “How cool!”.

Soon, however, it will be important to also teach readers to notice sections of a text that draw them in and to think in response to those sections, allowing themselves to linger there a bit. Part of the thinking they will do will involve asking and entertaining questions. We model that it helps to speculate, to generate a possible response to questions.

When reading nonfiction, readers must respond to, and ask questions related to:

- **Unfamiliar Vocabulary** - readers need to question the meaning of challenging words and use provided clues to determine the meaning of the word.
- **Text Features** - readers need to question how the text organization helps them find relevant information.
- **New Learnings** - readers must question the information they are reading.
- **Wonderings and Prior Knowledge** - readers must be shown to not only read on, seeking out answers, but also to think back over everything they have read so far and everything they already know.
Unit Overview

Immerse Stage

Week One - Ready Our Minds to Read Nonfiction
- Nonfiction versus fiction – 2 Lessons
- Think Aloud About Nonfiction

Week Two - Identifying Nonfiction Text Features
- Using Text Features to Successfully Navigate Nonfiction Texts
- Text Feature Scavenger Hunt
- Bold Words - Vocabulary

Investigate Stage

Week Three – Structure and Stamina
- Looking At Structure Within Nonfiction Text
  - Accessing Information Through Pictures and Images
  - Determining Importance and What To Ignore
  - 3-2-1 Structure: Skimming, Table of Contents, & Index
- Reading With Stamina In Nonfiction
  - Stamina and IPick
  - Background Knowledge
  - Text Annotation

Week Four - Pursuing Inquiries with Commitment
- Determining Inquiry
- 321 Organizer or Debbie Miller Schema
- Source Identification

Coalesce Stage

Week Five & Six - Becoming Experts and Teaching Others from Our Texts
- Crafting Our Own Responses to Nonfiction
- Sharing and Learning
- Revising Our Response

Go Public Stage

Week Six - Going Public
- Publishing Our Learning
Week One

Immerse Stage

Week One - Reading Our Minds To Read Nonfiction

- Nonfiction versus Fiction
- Think Aloud About Nonfiction

Nonfiction versus Fiction
- What is Nonfiction lesson (.pdf)
- Comparing Fiction and Nonfiction: (Gear, page 51)
- Creating A Venn Diagram (Gear, page 52)

Think Aloud About Nonfiction

Display the following anchor chart. Each day, add one new teaching point.
Immerse Stage

Week Two - Identifying Nonfiction Text Features
- Using Text Features to Successfully Navigate Nonfiction Texts
- Text Feature Scavenger Hunt

Identifying Nonfiction Text Features and Scavenger Hunt

<table>
<thead>
<tr>
<th>Text Features</th>
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<tbody>
<tr>
<td><strong>Fiction</strong></td>
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<tr>
<td>Title</td>
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<tr>
<td>Chapter Index</td>
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<tr>
<td>Illustrations</td>
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<td>Bold Print</td>
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<td>Continuous Text</td>
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<td>Paragraphing</td>
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Strategy: Text Features
Show how the book is set up. Distinguish between fiction and nonfiction text features.

Explore nonfiction text features.
See Sample Lessons:
- Nonfiction Feature Search (Gear, page 53)
- Creating Nonfiction Feature Dictionary (Gear, page 53)

Make a game out of it. For example, a scavenger hunt where they hunt for various information, such as what is a chapter, sub-heading, bold print, large print, italics, a paragraph, graphics, illustrations, index, glossary, etc. They need to know the purpose of each text feature before they can use it effectively.

Strategy: Bold Words - Vocabulary
Students must determine the meaning of unfamiliar words. Looking for context clues to be able to define the unknown or unfamiliar word helps students improve their vocabulary. With improved vocabulary, comprehension of text deepens.
Investigate Stage

Week Three – Structure and Stamina

- Looking for Structure Within Nonfiction Text
  - Accessing Information Through Pictures and Images
  - Determining Importance
  - Boxes and Bullets Structure to 3-2-1 Structure
- Reading With Stamina In Nonfiction
  - Stamina and iPick
  - Background Knowledge
  - Text Annotation

Looking for Structure within Nonfiction Text

Strategy: Determining Importance (Summarization)
Dispel that summarizing is simply the retelling of the story. Students require explicit modelling of determining importance: what is the main point and what information supports that point. Help students answer these two questions in a sentence or two to form a perfect summary.

Strategy: 3-2-1 Structure
Access to text through table of contents, index, and skimming
Model the 3-2-1 Structure to help students use organizer in their research.

Reading With Stamina In Nonfiction

Choosing Just Right Texts and Reading With Stamina, in Nonfiction (Calkins, page 48) and iPick (Daily 5 Strategy)

Strategy: Background Knowledge
Connect the information to the students’ background knowledge. Explicitly model how to connect background knowledge to new material. Use the file cabinet metaphor: If there is a file already in the cabinet, you can easily add information to that file. However, if there is no file, then you have to determine where it goes. By linking learning to what they already know, they can connect new to the old.

Strategy: Text Annotation
Students interact with the text by asking questions, make comments, etc. Using stickies, students can record the question, stick it next to the questioned text, and continue reading. An alternative to stickies is a handout or a visual that lists various questions for students to answer. Highlighting information is another way to keeping track of what is important. Highlighting must be explicitly modelled, otherwise, the whole page will be highlighted. Focusing on the main idea and its supporting details are the key in understanding what should be highlighted.
Investigate Stage

Week Four - Pursuing Inquiries with Commitment

- Determining Inquiry
- 321 Organizer or Debbie Miller Schema
- Source Identification

Pursuing Inquiries with Commitment

Strategy: Determining Inquiry

Students determine the question they want to answer. Use Debbie Miller’s think aloud to help students locate relevant information:

- What do I already know about the topic?
- What type of book or other source will help me best?
- Where will I find the information?
- How is the information organized in the source?
- How will I go about locating what I need?

After looking through the source of information ask yourself, “What did I learn? How can I synthesize my learning for myself and others?”

Strategy: Documenting Our Learning – 3-2-1

Strategy: Source Identification

It is important for students to document resources, especially when conducting research. Help students to thank authors for their work.

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Coalesce Stage

Week Five & Six - Becoming Experts and Teaching Others from Our Texts
- Crafting Our Own Responses to Nonfiction
- Sharing and Learning
- Revising Our Response

Crafting Our Own Responses to Nonfiction

**Day 1:** Help children choose a topic they feel like they are an expert in. Once they choose a topic they are an expert in have them complete this graphic organizer to help them think about their chapter ideas.

![Graphic Organizer]

**Day 2:** Create a table of contents to plan the book out.

![Table of Contents]

**Day 3:** Choose a chapter to start on and plan the chapter out with this chapter planning sheet.

![Chapter Planning Sheet]

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Day 4: Writers follow their chapter plan.

Day 5: Writers picture the chapter title in their mind, and think, “What do I see? What could I teach about that?”

Day 6: Writers add lots of specific details to their pictures, then they teach about what they added in their words (diagrams)

Day 7: Writers give mini lectures about their topics to themselves or to a partner to before they write to help add more details to their writing

Day 8: Writers can teach even more by rereading what they wrote and thinking to themselves, “What else could I teach about that?” to add more details

Day 9: Writers make their facts specific. I.e.: instead of “dogs eat dog food” teach about the names of different dog food

Day 10: Writers think about their audience and how they want the audience to feel and think about the information. I.e.: bugs might look scary but really most bugs are not dangerous.

Day 11: Writers who truly care about their topics are passionate about affecting their reader’s hearts and minds. They use their facts to expand their readers’ thinking and even rally them to action!

Day 12: Writers use glossaries in their non-fiction texts.

Day 13: Writers use data-and they get new ideas by collecting even more. I.e.: I am not sure how many mph a cheetah can run, but I know Bob knows all about cheetahs, I will ask him!

Day 14: Revision: Writers revise by thinking, “What are all the strategies I know to make my writing clear and interesting?” i.e.: adding more by taping it into the story
Day 15: Revision: Writers sometimes write an introduction to their book by telling the reader what they will learn and why it might be important to know this.

Day 16: Revision: Writers can end with a powerful conclusion restating their most important ideas and saying again why this topic matters so much.

Day 17: Writers choose a title by thinking, “What will get my readers interested in reading my book?” and then they make a title page!

Day 18: Editing: Do what the majority of your students need help with. Choose 1-3 editing skills, and do one per day. Some ideas: Capital letters, end marks, commas.

Day 19: Celebrate! Bring expertise to other classrooms.