Grade 6 Science

Grade 6

Cluster 1: Diversity of Living Things

Overview

In this cluster, students develop an appreciation of the diversity of living things. Students study a variety of classification systems, and construct and use their own as well as those developed by others. In doing so, they recognize the advantages and disadvantages of classification systems in organizing information. The animal kingdom provides a specific focus with students investigating different types of animals to understand where they fit in the classification of living things. Students compare and contrast the adaptations of closely related vertebrates living in different habitats, and the adaptations of vertebrates living today with those that lived in the past. Students learn about the contributions of individual scientists who have increased our understanding of the diversity of living things.

PRESCRIBED LEARNING OUTCOMES
Students will...
6-1-01 Use appropriate vocabulary related to their investigations of the diversity of living things. Include: classification system, classification key, paleontologist, terms related to names of kingdoms and types of vertebrates and invertebrates. GLO: C6, D1

SUGGESTIONS FOR INSTRUCTION

Teacher Notes

Prior Knowledge

Students have had previous experiences related to this cluster in Grade 4, Cluster 1: Habitats and Communities.

➢ Introduce, explain, use, and reinforce vocabulary throughout this cluster.

➢ **Three-Point Approach for Words and Concepts**

Have students work in groups to research one or more of the words related to types of vertebrates and invertebrates. Have students use a vocabulary think sheet, such as the Three-Point Approach (Simons, 1991), to record their research. Ask them to share their findings with the class. Have students update this information throughout the study of this cluster.

(For a BLM of the Three-Point Approach for Words and Concepts, see *SYSTH*, Attachment 10.2, or *Success*, p. 6.101.)

SUGGESTIONS FOR ASSESSMENT	SUGGESTED LEARNING RESOURCES

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-02 Describe various kinds of classification systems used in everyday life, and identify related advantages and disadvantages.

Examples: organization of phone numbers in a phone book, books in a library, groceries in a supermarket...

GLO: B1, B2, E1, E2

6-0-7f Reflect on prior knowledge and experiences to construct new understanding, and apply this new knowledge in other contexts. GLO: A2, C4 (ELA Grade 6, 1.2.1)

6-0-8e ⊂ Describe hobbies and careers related to science and technology. GLO: B4

6-0-8f ⊂ Recognize that science is organized into specialized disciplines. GLO: A1, B4

SUGGESTIONS FOR INSTRUCTION

➢ Classification Systems

Provide students with a variety of examples of classification systems such as mailing addresses, telephone directories, family trees, sports leagues, and the Dewey Decimal system of library classification. Ask the following questions:

- How are these systems organized?
- Why are these systems needed?

Have students list the advantages and disadvantages of each system.

➢ Classification of Science

Introduce the concept that science is divided into specialized areas of study through the following learning experiences:

Part A

Have students match up the scientific area with its definition.

Area of Study	Definition
1. geology	a. study of motion and energy
2. astronomy	b. study of living things
3. biology	c. study of the Earth
4. chemistry	d. study of the properties of materials and substances
5. physics	e. study of space

(1. c, 2. e, 3. b, 4. d, 5. a)

Part B

Have students indicate which area of study is associated with each of the following jobs. Ask students to explain their answers.

- dry cleaner
- farmer
- chef
- astronaut
- doctor
- lighting technician
- miner
- mechanic
- astronomer

Note: Jobs will fit under several areas of study, depending on what aspect of the job is focused on.

Have students answer the following questions:

1. Was it easy to place the different jobs with one specialized area of study in science? Why or why not?
2. What are the advantages of dividing science into specialized areas of study? What are the disadvantages?

Suggestions for Assessment

Suggested Learning Resources

Extended Response

Provide students with the following:

Using Classification Systems

Discuss the advantages and disadvantages of the following classification systems:

1. a telephone directory
2. a music classification system

Look for:

1. Telephone directory
   - Advantages: names are organized in alphabetical order; names are generally easy to find
   - Disadvantages: users need to know the correct spelling of last names, as well as addresses (if there are many people with the same name); some numbers are unlisted; not everyone has a telephone or is listed in the directory
2. Music classification system
   - Advantages: music is organized according to different types; names of artists/songs can be easier to find if the type of music is known
   - Disadvantages: some artists/songs may fit in many categories; some music is difficult to classify

Pan Canadian Science Place 6: *Variety of Life* (Lesson 4)

Science Everywhere 6 (pp. 31-37)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-03 Develop a system to classify common objects or living things into groups and subgroups, and explain the reasoning used in the system's development.

GLO: A1, C2, E1, E2

6-0-5a ⊂ Make observations that are relevant to a specific question. GLO: A1, A2, C2

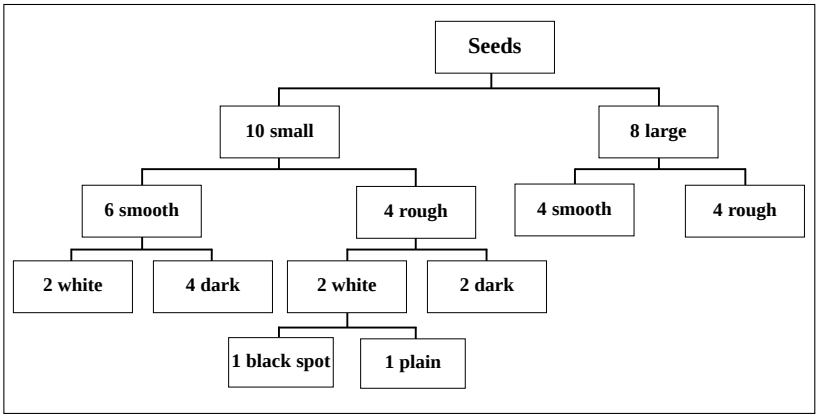
SUGGESTIONS FOR INSTRUCTION

➢ Classification of Objects and Living Things

Provide students with a collection of pictures, words, geometric shapes, and so on, or with a collection of objects such as leaves, paper clips, and seeds. Have students

- classify and sort their collections into main categories and then into sub-categories
- label categories
- present their classification systems to the class and justify the reasoning behind their classification choices

Example:



➢ Classification Mysteries

Have students

- classify a collection of pictures (e.g., of pets) or objects (e.g., seeds, paper clips)
- prepare a set of questions that lead the reader to a particular animal/object on their classification system
- try out their questions with classmates

Example:

I am a small seed. I am rough and white. I have a small spot on my side. Which seed am I?

SUGGESTIONS FOR ASSESSMENT

SUGGESTED LEARNING RESOURCES

Classification Key Development

Provide students with the following self-assessment tool:

Classification Key Development
I classified _____
1. One problem I had was _____
2. One thing I did well was _____
3. I would like to learn more about _____
4. I think my classification key _____
_____

PRESCRIBED LEARNING OUTCOMES
Students will...
6-1-04 Identify living things using an existing classification key, and explain the rationale used. *Examples: identification of birds, butterflies, animal tracks, winter twigs...* GLO: A1, C2, D1, E2
6-0-5a ➲ Make observations that are relevant to a specific question. GLO: A1, A2, C2 **6-0-7f** Reflect on prior knowledge and experiences to construct new understanding, and apply this new knowledge in other contexts. GLO: A2, C4 (ELA Grade 6, 1.2.1)

SUGGESTIONS FOR INSTRUCTION

➢ Using a Classification Key

Provide students with a classification key and have them use it to identify a particular living thing. Ask students to explain their reasoning for identifying the organisms as they did.

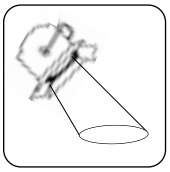
Teacher Notes

Local nature centres often have simplified versions of identification keys. Commercial products are also available. A fish classification key and learning outcome-related pictures and blackline masters can be found on the Manitoba Fisheries website at <www.gov.mb.ca/natres/sustain/educate>.

The emphasis of this learning activity is on experiencing how an identification key works, not on becoming an expert in identifying birds, trees, and so on. A class may have "experts" in their ranks who can share their expertise in particular areas.

SUGGESTIONS FOR ASSESSMENT

SUGGESTED LEARNING RESOURCES



Classifying

Provide students with a picture of a living thing to identify, using the classification key provided for the Using a Classification Key learning activity (learning outcome 6-1-04).

Have students

- use the classification key to identify the living thing
- clearly record their decisions and accompanying rationale at each decision point

Once all students have completed their identification, provide the correct identification, including the decisions at each step that led to this identification. Have students compare their decisions and identify where they went wrong (if they did) and comment on the process.

Look for:

- student decisions and rationale are clearly identified
- incorrect decisions are identified
- comments are included

Science Everywhere 6 (p. 33)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-05 Identify advantages and disadvantages of having a common classification system for living things, and recognize that the system changes as new evidence comes to light.

GLO: A1, A2, D1, E2

6-0-7f Reflect on prior knowledge and experiences to construct new understanding, and apply this new knowledge in other contexts. GLO: A2, C4 (ELA Grade 6, 1.2.1)

6-0-7h Identify potential applications of investigation results. GLO: C4

6-0-8b ⊂ Identify examples of scientific knowledge that have developed as a result of the gradual accumulation of evidence. GLO: A2

SUGGESTIONS FOR INSTRUCTION

➢ Common Classification System

Have students look at the classification systems they developed in relation to learning outcome 6-1-03. Have them compare the names and groupings that other students in the class used to classify the same set of objects. Ask students:

1. Are there differences?
2. What would be the advantages or disadvantages of one classification system over the other?

Ask students if they think the classification system for living things has ever changed (it has), and if so, why changes happen (scientists discover new living things or learn more about others).

If appropriate, have students share other ways of grouping/classifying living things that reflect views other than that of western science. An Aboriginal perspective, for example, may look at animals according to what they provide (e.g., food, shelter). Emphasize to students that the focus of this cluster is on the scientific way of classifying living things, and that this system has its own inherent advantages and disadvantages.

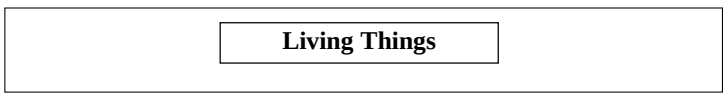
➢ Advantages and Disadvantages

Divide students into small groups. Have each group discuss and list either the advantages or disadvantages of a common scientific classification system for living things. Match an "advantages" group with a "disadvantages" group and have students share their ideas. Have each group share their findings with the class. Ask students how we can communicate accurately if we have different names for the same thing.

➢ Classification Chart

As the class works through the learning experiences suggested for this cluster, students could add appropriate vocabulary to a large classification chart posted on a classroom wall.

As the first step, have students create a heading for the classification chart: Living Things.



Note: Students add to the classification chart as part of the learning experiences suggested for learning outcomes 6-1-06, 6-1-09, 6-1-10, and 6-1-12.

Suggestions for Assessment

Suggested Learning Resources

Extended Response

Provide students with the following:

Scientific Classification System

List the advantages and disadvantages of a common scientific classification system. Be sure to include three advantages and three disadvantages.

Look for:

Advantages:

- uses the same terminology
- makes it easier to find and describe things
- makes it easier to determine characteristics

Disadvantages:

- may not meet everyone's needs
- implies there is only one way to classify things
- not everything may fit
- may lead to stereotyping

Pan Canadian Science Place 6: *Variety of Life* (Lesson 6)

Science Everywhere 6 (p. 37)

Native Science: Natural Laws of Interdependence (Teacher Reference)

Igniting the Sparkle: An Indigenous Science Education Model (Teacher Reference)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-06 Identify the five kingdoms commonly used for the classification of living things, and provide examples of organisms from each to illustrate the diversity of living things.

Include: monerans, protists, fungi, plants, animals.

GLO: A1, D1, E1, E2

6-0-2a ↻ Access information using a variety of sources. *Examples: libraries, magazines, community resource people, outdoor experiences, videos, CD-ROMs, Internet…* GLO: C6 (ELA Grade 6, 3.2.2; Math: SP-II.1.6; TFS 2.2.1)

6-0-2c Make notes on a topic, combining information from more than one source and referencing sources appropriately. GLO: C6 (ELA Grade 6, 3.3.2)

6-0-4c ↻ Work cooperatively with group members to carry out a plan, and troubleshoot problems as they arise. GLO: C7 (ELA Grade 6, 5.2.2)

6-0-4d Assume various roles to achieve group goals. GLO: C7 (ELA Grade 6, 5.2.2)

6-0-7g ↻ Communicate methods, results, conclusions, and new knowledge in a variety of ways. *Examples: oral, written, multimedia presentations...* GLO: C6 (ELA Grade 6, 4.4.1; TFS: 3.2.2, 3.2.3)

SUGGESTIONS FOR INSTRUCTION

➢ Readers Theatre

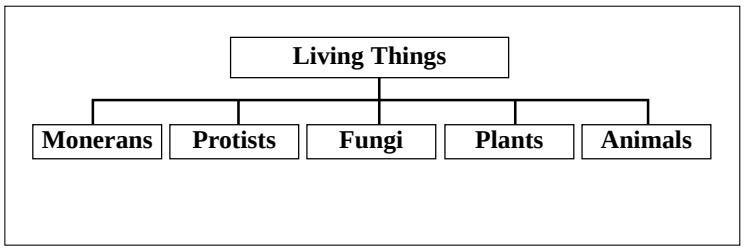
Divide students into five groups. Have each group

- research one of the kingdoms commonly used for classifying living things
- determine the general description of the kingdom and find examples of diverse organisms from that kingdom
- write a section for a Readers Theatre script describing their kingdom
- present the completed Readers Theatre to another class if possible

(Readers Theatre is a form of drama in which students read aloud from scripts with no special costumes, sets, props, or music. See *5-8 ELA*, Strategies, pp. 42-43.)

➢ Classification Chart

Add the terms *monerans*, *protists*, *fungi*, *plants*, and *animals* to the classroom classification chart (refer to learning outcome 6-1-05). Representative pictures can also be added to the chart.



Suggestions for Assessment

Suggested Learning Resources

Restricted Response

Note: the following question can be used as an Admit Slip or an Exit Slip. Provide students with the following:

Five Kingdoms

Name the five kingdoms commonly used to classify living things. Give an example from each.

Pan Canadian Science Place 6: *Variety of Life* (Lessons 8-9)

Science Everywhere 6 (pp. 34-35)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-07 Recognize that many living things are difficult to see with the unaided eye, and observe and describe some examples.

GLO: C2, D1, E1

6-0-5a ⊂ Make observations that are relevant to a specific question. GLO: A1, A2, C2

6-0-5c Select and use tools and instruments to observe, measure, and construct. *Examples: hand lens, telescope, binoculars…* GLO: C2, C3, C5

6-0-5f ⊂ Record and organize observations in a variety of ways. *Examples: point-form notes, sentences, labelled diagrams, charts, ordered lists of data, frequency diagrams, spread sheets…* GLO: C2, C6 (ELA Grade 6, 3.3.1; Math: SP-III.2.6)

6-0-9e ⊂ Be sensitive to and develop a sense of responsibility for the welfare of other humans, other living things, and the environment. GLO: B5

SUGGESTIONS FOR INSTRUCTION

➢ **Grass Observation**

Ask students to mark off a small area of the school lawn using string loops and small stakes. Ask students to look for living organisms within this marked area and to draw what they see. Then provide students with hand lenses and have them look at the same area again. Ask students to compare their findings. How did the hand lens aid their observations?

➢ **Observing Pond Organisms**

Provide groups of students with samples of pond water and ask them to describe what they can observe with the unaided eye. Next, have students observe the same sample using a hand lens and record their observations using drawings and descriptions. If a microscope is available, set up a pond water slide for students to view (instructing students not to adjust the magnification without teacher supervision). Ask students to explain how the hand lens aided their observations and what they have learned about the diversity of living things.

➢ **I've Shrunk!**

Have students imagine that they have been reduced to the size of a small insect such as an ant. Have them write and illustrate a story about the organisms they imagine themselves to be as they go through the course of a day. The stories and illustrations could be compiled into a classroom book and shared with other classes.

Suggestions for Assessment

Suggested Learning Resources

Restricted Response

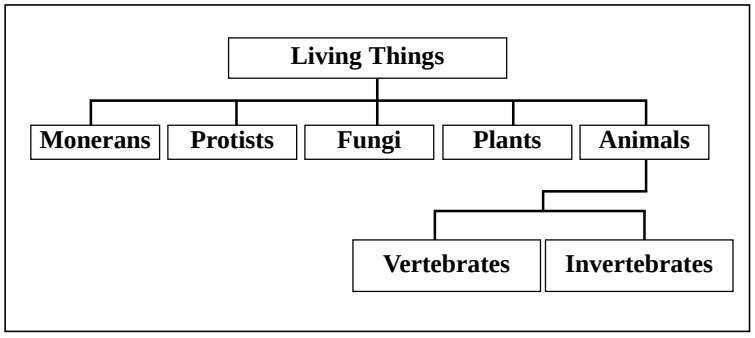
Provide students with the following:

How Can Tools Help Us See?

1. Name four different living things that are difficult to see with just your eyes.
2. What instruments might you use to see these living things more clearly?

Pan Canadian Science Place 6: *Variety of Life* (Lesson 9)

Science Everywhere 6 (pp. 56-57)

PRESCRIBED LEARNING OUTCOMES	SUGGESTIONS FOR INSTRUCTION
Students will...	
6-1-08 Observe and describe the diversity of living things within the local environment. Include: fungi, plants, animals. GLO: A1, C2, D1, E1 **6-0-5a** ⊂ Make observations that are relevant to a specific question. GLO: A1, A2, C2 **6-0-5f** ⊂ Record and organize observations in a variety of ways. *Examples: point-form notes, sentences, labelled diagrams, charts, ordered lists of data, frequency diagrams, spread sheets…* GLO: C2, C6 (ELA Grade 6, 3.3.1; Math: SP-III.2.6)	➢ **Field Trip** Take students into the schoolyard or into a surrounding area. Have them look for examples that represent the different animal kingdoms and record their findings. Back in the classroom, have students share their findings. Highlight the diversity within the samples found. The Ducks Unlimited Canada website <http://www.ducks.ca> contains background information and student learning activities that highlight the diversity of living things found in wetland. (For information regarding field trips, refer to *Science Safety: A Kindergarten to Senior 4 Resource Manual for Teachers, Schools, and School Divisions,* 1997.) ➢ **Diversity Reflection** Have students use their science notebooks to reflect on the question: What happens when the diversity of living things is reduced in an area? (Example: With single-crop farming, one disease can wipe out all crops.)
6-1-09 Recognize that the animal kingdom is divided into two groups, vertebrates and invertebrates, and differentiate between the two. Include: vertebrates have backbones, invertebrates do not. GLO: D1, E1 **6-0-9c** ⊂ Demonstrate confidence in their ability to carry out investigations. GLO: C5	➢ **Vertebrates or Invertebrates?** Use guided discussion and/or reading and research to distinguish between vertebrates and invertebrates. Look at some examples of each. ➢ **Classification Chart** Add the terms *vertebrates* and *invertebrates* to the classroom classification chart (refer to learning outcome 6-1-05). Representative pictures can also be added to the chart. 

SUGGESTIONS FOR ASSESSMENT	SUGGESTED LEARNING RESOURCES

Extended Response

Provide students with the following:

Diversity of Living Things

1. What living things would you expect to find in the environment pictured above?
2. Would you expect to find examples from all five kingdoms? Why or why not?

Pan Canadian Science Place 6: *Variety of Life* (Lesson 2)

Science Everywhere 6 (p. 29)

Restricted Response

Provide students with the following:

Animal Kingdom

The animal kingdom is divided into two groups. What are these groups? Give three examples of animals from each group.

Pan Canadian Science Place 6: *Variety of Life* (Lesson 8)

Black Widow Spider and More (Video)

Science Everywhere 6 (pp. 38-44, 50-54)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-10 Provide examples of a variety of invertebrates to illustrate their diversity.

Include: sponges, worms, molluscs, arthropods.

GLO: D1, E1

6-0-2a ⊂ Access information using a variety of sources. *Examples: libraries, magazines, community resource people, outdoor experiences, videos, CD-ROMs, Internet…* GLO: C6 (ELA Grade 6, 3.2.2; Math: SP-II.1.6; TFS 2.2.1)

6-0-2b ⊂ Review information to determine its usefulness, using predetermined criteria. GLO: C6, C8 (ELA Grade 6, 3.2.3)

6-0-2c Make notes on a topic, combining information from more than one source and referencing sources appropriately. GLO: C6 (ELA Grade 6, 3.3.2)

6-0-4c ⊂ Work cooperatively with group members to carry out a plan, and troubleshoot problems as they arise. GLO: C7 (ELA Grade 6, 5.2.2)

6-0-4d Assume various roles to achieve group goals. GLO: C7 (ELA Grade 6, 5.2.2)

6-0-5f ⊂ Record and organize observations in a variety of ways. *Examples: point-form notes, sentences, labelled diagrams, charts, ordered lists of data, frequency diagrams, spread sheets…* GLO: C2, C6 (ELA Grade 6, 3.3.1; Math: SP-III.2.6)

6-0-7g ⊂ Communicate methods, results, conclusions, and new knowledge in a variety of ways. *Examples: oral, written, multimedia presentations...* GLO: C6 (ELA Grade 6, 4.4.1; TFS: 3.2.2, 3.2.3)

SUGGESTIONS FOR INSTRUCTION

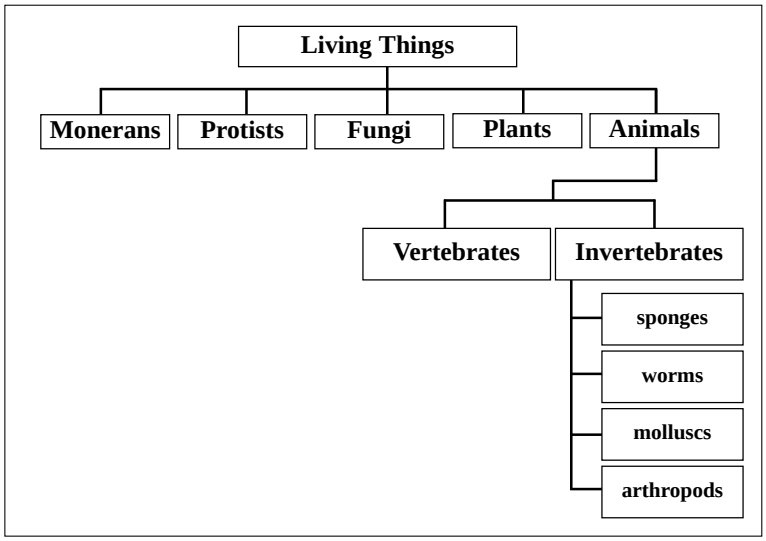
➢ Jigsaw (Cooperative Learning Strategy)

Use a Jigsaw strategy (Aronson et al, 1978) to have students learn about the four groups of invertebrates.

- Divide the class into home groups or teams, each consisting of four members.
- Assign each team member an invertebrate group.
- Students from each team who are assigned the same invertebrate meet together as an expert team to research and create their own definition and description of their invertebrate group. They also include drawings (or cut out pictures) of two or three different examples along with one interesting fact.
- Each expert team member then shares this information with the home team. All members of the home team are responsible for all the information provided by each member of their team, as well as their own information.
- Ensure that students use appropriate note-taking methods to record information in their science notebooks.

➢ Classification Chart

Add the terms *sponges*, *worms*, *molluscs*, and *arthropods* to the classroom classification chart (refer to learning outcome 6-1-05). Representative pictures can also be added to the chart.



SUGGESTIONS FOR ASSESSMENT

SUGGESTED LEARNING RESOURCES

Pan Canadian Science Place 6: *Variety of Life* (Lesson 7)

Black Widow Spider and More (Video)

Science Everywhere 6 (p. 53)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-11 Compare and contrast adaptations of common arthropods, and describe how these adaptations enable them to live in particular habitats.

GLO: D1, D2, E1

6-0-1c Identify practical problems to solve. *Examples: How can I make a hot-air balloon? Which type of light bulb should I buy?…* GLO: C3

6-0-1d ⊂ Identify various methods to solve a practical problem, and select and justify one to implement. *Examples: constructing and testing a prototype; evaluating consumer products; accessing information from a variety of sources...* GLO: C3 (Math: SP-I.2.6, SP-II.1.6)

6-0-3d ⊂ Develop criteria to evaluate a prototype or consumer product. Include: function, aesthetics, use of recycled materials, cost, reliability. GLO: C3

6-0-3e ⊂ Create a written plan to solve a problem. Include: materials, safety considerations, labelled diagrams of top and side views, steps to follow. GLO: C1, C3, C6

6-0-4b ⊂ Construct a prototype. GLO: C3

6-0-5b ⊂ Test a prototype or consumer product, using predetermined criteria. GLO: C3, C5

6-0-6d ⊂ Identify and make improvements to a prototype, and explain the rationale for the changes. GLO: C3, C4

6-0-7f Reflect on prior knowledge and experiences to construct new understanding, and apply this new knowledge in other contexts. GLO: A2, C4 (ELA Grade 6, 1.2.1)

6-0-7g ⊂ Communicate methods, results, conclusions, and new knowledge in a variety of ways. *Examples: oral, written, multimedia presentations...* GLO: C6 (ELA Grade 6, 4.4.1; TFS: 3.2.2, 3.2.3)

SUGGESTIONS FOR INSTRUCTION

➢ **Crustacean-Insect Comparison**

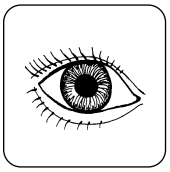
Provide small groups of students with a picture of a crayfish and a housefly (or other common arthropods). Have students use a Venn Diagram to compare and contrast the structural adaptations of the arthropods. Ask students to reflect on how such different organisms can belong to the same group: arthropods. (Students will need to apply what they have learned about the group arthropods to realize that important key characteristics are the same, even though many other characteristics are not.)

➢ **Designed to Survive**

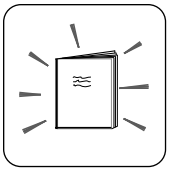
Have students follow the design process to plan and then create their own model arthropod for a given habitat (imaginary or real). The prototype, which could be made from materials such as clay, modelling paste, or papier mâché, must include physical characteristics indicating that it is an arthropod. Ensure that students include information on the food available, space needed, predators, shelter, how the animal moves, and so on. Have students present their prototypes to the class, explaining the adaptations included and how they enable the animal to live in its environment.

(For further student materials related to adaptations, visit *A Prairie Tour: A Grade 5 Interdisciplinary Middle Years Multimedia Unit for Teachers*, online at <http://www.edu.gov.mb.ca/metks4/tech/currtech/imym/prairietour/>.)

Suggestions for Assessment



When assessing the Designed to Survive prototypes, refer to "Constructing a Prototype: Observation Checklist" (BLM 6-D).



Design Process Presentations

Provide students with the following tool for peer assessment of the "Designed to Survive" projects:

Peer Assessment of Presentation

Speaker:_____

Peer assessor: _____

Criteria	Yes	No	Comments
The speaker spoke so that everyone could hear.			
The speaker explained how the prototype was constructed.			
The speaker explained how the prototype met the criteria.			
The speaker kept the interest of the group.			

Suggested Learning Resources

Pan Canadian Science Place 6: *Variety of Life* (Lesson 7)

Black Widow Spider and More (Video)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-12 Classify vertebrates as fishes, amphibians, reptiles, birds, and mammals, and provide examples to illustrate the diversity within each group.

GLO: D1, E1

6-0-4c ➲ Work cooperatively with group members to carry out a plan, and troubleshoot problems as they arise. GLO: C7 (ELA Grade 6, 5.2.2)

6-0-7f Reflect on prior knowledge and experiences to construct new understanding, and apply this new knowledge in other contexts. GLO: A2, C4 (ELA Grade 6, 1.2.1)

SUGGESTIONS FOR INSTRUCTION

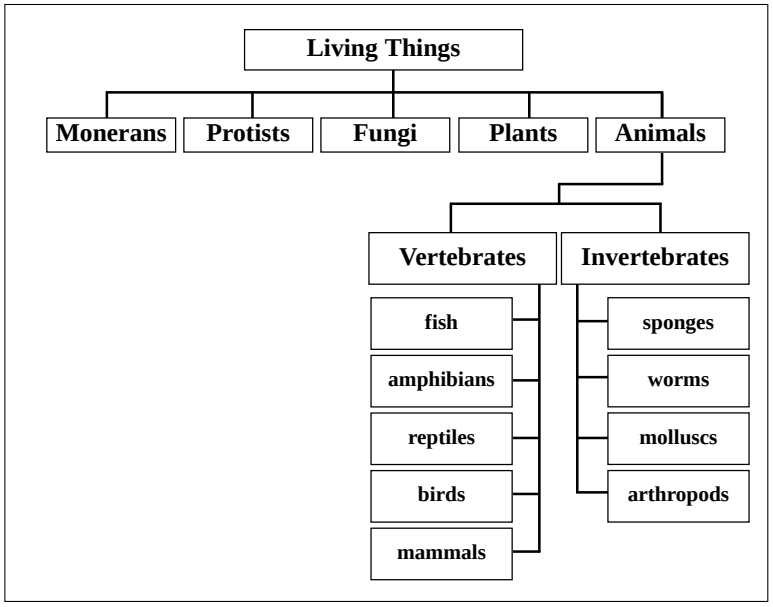
➢ Vertebrate Brainstorm

Have students brainstorm characteristics and examples of each vertebrate group. Use a Concept Frame (Matchullis and Mueller, 1994) to record student findings for each group.

(For a BLM of a Concept Frame, see *Success*, p. 6.111.)

➢ Classification Chart

Add the terms *fish, amphibians, reptiles, birds,* and *mammals* to the third level of the classroom classification chart (refer to learning outcome 6-1-05). Representative pictures can also be added to the chart.

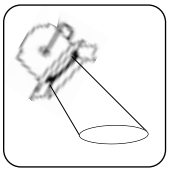


➢ Vertebrate Identification

Prepare a set of cards that have a picture of an animal on one side and a description of its key characteristics on the other side. Divide the class into five small groups. Give each group the cards for a specific vertebrate group. Ask students to come up with a name for their group of pictures, and to list what they think are the key characteristics of the groups.

SUGGESTIONS FOR ASSESSMENT

SUGGESTED LEARNING RESOURCES



Vertebrate Game Show

Have students develop a set of answers and accompanying questions related to the five groups of vertebrates. Have them sort the answers according to level of difficulty.

Example:

Points	Fish	Amphibians	Reptiles	Birds	Mammals
10	The name given to the skin covering of a fish. (scales)	Where all amphibians spend part of their life cycle. (water)	The largest living lizard. (Komodo dragon)	The name given to the feet of an owl or hawk. (claw)	The name given to the skin covering of a mammal. (fur or hair)
25					

Have students choose roles (e.g., contestant and quizmaster) and conduct a game show using the answers and accompanying questions they developed.

Example:

Contestant: I'd like "Fish" for 10 points.

Quizmaster: The name given to the skin covering of a fish.

Contestant: What are scales?

etc.

Pan Canadian Science Place 6: *Variety of Life* (Lesson 8)

Science Everywhere 6 (pp. 41-42)

PRESCRIBED LEARNING OUTCOMES	SUGGESTIONS FOR INSTRUCTION
Students will...	
6-1-13 Compare and contrast the adaptations of closely related vertebrates living in different habitats, and suggest reasons that explain these adaptations. GLO: D1, D2, E1	➢ **Comparison Research** Have students select two closely related vertebrates (e.g., polar bear/black bear, arctic fox/red fox, ptarmigan/prairie chicken, sturgeon/pike) living in different habitats. Ask them to • research the selected vertebrates to compare and contrast their adaptations and suggest reasons for the differences (habitat related) • use a Venn diagram to represent their findings • share their findings with the class
6-0-2a ⊂ Access information using a variety of sources. *Examples: libraries, magazines, community resource people, outdoor experiences, videos, CD-ROMs, Internet…* GLO: C6 (ELA Grade 6, 3.2.2; Math: SP-II.1.6; TFS 2.2.1) **6-0-2b** ⊂ Review information to determine its usefulness, using predetermined criteria. GLO: C6, C8 (ELA Grade 6, 3.2.3) **6-0-2c** Make notes on a topic, combining information from more than one source and referencing sources appropriately. GLO: C6 (ELA Grade 6, 3.3.2) **6-0-7g** ⊂ Communicate methods, results, conclusions, and new knowledge in a variety of ways. *Examples: oral, written, multimedia presentations...* GLO: C6 (ELA Grade 6, 4.4.1; TFS: 3.2.2, 3.2.3)	
6-1-14 Identify, based on evidence gathered by paleontologists, similarities and differences in animals living today and those that lived in the past. *Examples: archaeopteryx and modern birds...* GLO: A1, A2, E1, E3	➢ **Past-Present Comparison** Have students research examples of how certain modern animals have changed, as suggested by their fossil records (e.g., woolly mammoth/elephant, Eohippus/horse). Ask students to note the similarities and differences and indicate what evidence scientists use to support their work. Have them use drama, music, or multimedia resources to present their findings. ➢ **Stories of the Past** Have students use print or electronic resources, or invite a guest speaker, to identify and share Aboriginal stories about the relatives of today's animals that lived long ago (e.g., the giant beaver).
6-0-2a ⊂ Access information using a variety of sources. *Examples: libraries, magazines, community resource people, outdoor experiences, videos, CD-ROMs, Internet…* GLO: C6 (ELA Grade 6, 3.2.2; Math: SP-II.1.6; TFS 2.2.1) **6-0-2b** ⊂ Review information to determine its usefulness, using predetermined criteria. GLO: C6, C8 (ELA Grade 6, 3.2.3) **6-0-2c** Make notes on a topic, combining information from more than one source and referencing sources appropriately. GLO: C6 (ELA Grade 6, 3.3.2) **6-0-7g** ⊂ Communicate methods, results, conclusions, and new knowledge in a variety of ways. *Examples: oral, written, multimedia presentations...* GLO: C6 (ELA Grade 6, 4.4.1; TFS: 3.2.2, 3.2.3)	

SUGGESTIONS FOR ASSESSMENT	SUGGESTED LEARNING RESOURCES

Extended Response

Provide students with the following:

Comparing Bears

Polar Bear **Grizzly Bear**

1. Compare and contrast the polar bear and the grizzly bear. Be sure to discuss their habitats and their adaptations.
2. Look at the differences related to adaptations. Why might these differences have occurred?

Science Everywhere 6 (p. 46)

Extended Response

Provide students with the following:

Information About the Past

1. How are the wooly mammoth and the elephant alike? How are they different?
2. Explain how we are able to make these comparisons.

Look for:

1. Any reasonable response such as
   - both have tusks
   - the mammoth has much longer tusks than the elephant
   - both have trunks
   - both have large ears
2. The evidence gathered by paleontologists allows us to make these comparisons

Pan Canadian Science Place 6: *Variety of Life* (Lesson 15)

Science Everywhere 6 (p. 36)

PRESCRIBED LEARNING OUTCOMES

Students will...

6-1-15 Identify and describe contributions of scientists and naturalists who have increased our understanding of the diversity of living things.

GLO: A2, A4, B4, D1

6-0-2a ⊂ Access information using a variety of sources. *Examples: libraries, magazines, community resource people, outdoor experiences, videos, CD-ROMs, Internet…* GLO: C6 (ELA Grade 6, 3.2.2; Math: SP-II.1.6; TFS 2.2.1)

6-0-2b ⊂ Review information to determine its usefulness, using predetermined criteria. GLO: C6, C8 (ELA Grade 6, 3.2.3)

6-0-2c Make notes on a topic, combining information from more than one source and referencing sources appropriately. GLO: C6 (ELA Grade 6, 3.3.2)

6-0-7g ⊂ Communicate methods, results, conclusions, and new knowledge in a variety of ways. *Examples: oral, written, multimedia presentations...* GLO: C6 (ELA Grade 6, 4.4.1; TFS: 3.2.2, 3.2.3)

6-0-8e ⊂ Describe hobbies and careers related to science and technology. GLO: B4

6-0-9a ⊂ Appreciate that women and men of diverse cultural backgrounds can contribute equally to science. GLO: A4

6-0-9b ⊂ Show interest in the activities of individuals working in scientific and technological fields. GLO: B4

SUGGESTIONS FOR INSTRUCTION

➢ **Research**

Post a list of scientists such as Louis Pasteur, Jonas Salk, David Suzuki, Charles Darwin, Dian Fossey, Jane Goodall, Grey Owl, John James Audubon, Thomas Seton, Jacques Cousteau, Mary Victorian, Georges Cuvier, and Dr. Baldur Stefansson (University of Manitoba). Ensure that the list includes scientists from both genders and from diverse cultural backgrounds, and highlights Canadians, when possible.

Have students select a naturalist or scientist and research his or her contributions, using a W-5 Chart (Who? What? Where? When? Why?) to record information gathered through their research. Instruct students to include: birth date, nationality, contribution, and date of contribution. Have students share the information with the class through role-played interviews, news conferences, obituary notices, curricula vitae, or newspaper articles.

(For a BLM of a W-5 Chart, see *5-8 ELA*, BLM-67.)

Suggestions for Assessment

Suggested Learning Resources

Cluster Reflection

Have students reflect on their learning related to the diversity of living things using the following sentence stems:

Reflection

1. I learned . . .
2. I was surprised . . .
3. I still wonder . . .

Pan Canadian Science Place 6: *Variety of Life* (Lessons 9, 12)

Science Everywhere 6 (p. 60)

World of Scientific Discovery (Teacher Reference)

Notes