**North East School Division Planning Organizer**



**Science Grades 6 - 9**

|  |
| --- |
| **Stage 1 – Begin With the End in Mind** |
| **Big Ideas** What do we want students to remember 40 years from now? |
| **All Living Things are Connected**  |
| **Outcomes** (Circle the verbs or skills, underline the qualifiers |
| DL6.1 - **Recognize, describe, and appreciate the diversity of living things in local and other ecosystems, and explore related careers.** DL6.2 - **Examine how humans organize understanding of the diversity of living things.** DL6.3 - **Analyze the characteristics and behaviours of vertebrates (i.e., mammals, birds, reptiles, amphibians, and fish) and invertebrates.**  DL6.4 - **Examine and describe structures and behaviours that help:** * **individual living organisms survive in their environments in the short term**
* **species of living organisms adapt to their environments in the long term.**

DL6.5 - **Assess effects of micro-organisms on past and present society, and contributions of science and technology to human understanding of micro-organisms.****Recognize🡪diversity of living things****Describe🡪diversity of living things****Appreciate🡪 diversity of living things in ecosystems****Explore🡪 careers****Examine🡪 ways to classify living things****Analyze🡪 characteristics of vertebrates and invertebrates** **Analyze 🡪 behaviours of vertebrates and invertebrates****Examine🡪structures and behaviours for ( short term survival and long term adaptations)****Describe🡪 structures and behaviours for ( short term survival and long term adaptations)****Assess🡪 effects of micro-organisms on society** **Assess 🡪 contributions of science and technology to human understanding** |
| **Understandings** What do we hope students will come to understand as a result of learning? Think: Students will understand that… | **Essential Questions** Questions for deeper understanding that invite deep thinking about the ideas and issues throughout the unit. |
| * There are diverse and numerous living organisms in different habitats around the world.
* We use classification systems to recognize the similarities and differences amongst living organisms.
* There are multiple ways to classify living things depending on one’s needs.
* Common classification systems help to develop and communicate common understandings.
* Current biological classification systems are based on both internal and external characteristics and behaviours – looks can deceive
* Survival of living organisms depends on physical characteristics and adapted behaviours.
* What you can’t see could hurt or help you.
* There are respectful ways to examine ecosystems and organisms within them.
* First Nations and Métis cultures reflect a worldview that values all living things and their worldview shapes their system of organizing understanding of living things.
* Science is the study of trends or patterns over time. There are often aspects of scientific study that are not exact and determining reasons for this is part of scientific study.
* Science is based as much on questions as on answers.
* Adaptations happen over time.
* Looking at past evidence (fossils) helps us understand the present and predict the future.
* We can study things we cannot see with specialized tools.
 | 1. How do living things survive?
2. How do living things suit their environment?
3. Why is it necessary to classify living things?
4. How powerful are invisible organisms?
5. Who helps us understand living things?
6. How can I classify?
7. How do living things survive challenging conditions?
8. How do certain organisms become extinct?
9. How can I study things and still protect them?
10. How do others view the world of living things?
11. How can science be about questions?
12. How do organisms adapt and why?
13. How can the past predict the future?
 |
| **Students need to know:** What is essential knowledge for students to have in order to demonstrate their understanding of the outcomes?  | **And be able to do:** What should they eventually be able to do as a result of their learning experiences in order to achieve the outcome? Should reference the indicators. Think: verb.  |
|  * Characteristics and behaviours of living things – body shape, body description, method of respiration, method of reproduction, method of movement, method of feeding
* Diversity of living things in different habitats
* First Nations and Métis worldview on living things
* Science and technology careers related to living things
* The five kingdoms of taxonomy (monera, protists, fungi, plants and animals)
* Scientific terminology related to living things, classification, ecosystems, vertebrates and invertebrates and micro-organisms – biotic, abiotic, kingdom, phylum, monera, protest, fungi, plant, animal, vertebrate, invertebrate, respiration, classify, diversity, habitat, ecosystem, terrestrial, aquatic, characteristic, behaviour, reproduction
* Invertebrate examples – arthropods, annelids, cnidarids, echinoderms, molluscs, nematodes
* Characteristics and behaviours of vertebrates and invertebrates
* The difference between structural characteristics, physical characteristics and behaviours
* Short-term structures and behaviours of organisms to survive in their environments
* Long-term adaptations of structures and behaviours of species of organisms – flippers, webbed feet, night-time vision, wide wings, camouflage colouring, migration, hibernation
* Difference between endangered and extinct
* The basic needs and characteristics of micro-organisms
* How to use appropriate tools to study micro-organisms
* Positive and negative impacts of micro-organisms on humans – food production and spoilage, fermentation, pasteurization, water and sewage treatment, human digestion, composting, disease spread and prevention, biological warfare
* How to study organisms – ways and strategies for exploring and documenting findings
 |  * Observe and document living things in their local habitat and other habitats (journaling, nature walk, etc.)
* Analyze the First Nations and Métis worldview and organization of living things – including underlying criteria
* Identify different science and technology careers related to diversity of living things
* Develop criteria for classifying living things and use it to classify or group living things – student-developed criteria
* Consider personal ideas and observations and those of others when designing classification systems – ask questions, share stories
* Construct a visual representation showing examples from each kingdom
* Use appropriate scientific terminology to communicate ideas.
* Identify and classify animals as vertebrates and invertebrates
* Critique the advantages of a classification system
* Compare and represent the characteristics and behaviours of vertebrates and invertebrates (student-selected)
* Propose questions for inquiry and gather information from a variety of sources.
* Suggest reasons why classification is based on structural characteristics rather than physical appearance
* Propose questions and describe examples of structures, behaviours and adaptations of organisms that help individuals survive in their environments
* Describe examples of structures and behaviours, including seasonal changes, which help living things survive in their environments
* Describe adaptations that help with long term survival
* Explain how fossils link to the study of diversity of living things.
* Suggest reasons why species have become endangered and extinct
* Compare closely-related animals that live in different parts of the world and propose reasons for similarities and differences – research advantages of particular structures or behaviours
* Suggest reasons for similar studies to show different results.
* Demonstrate appropriate use of tools needed to study micro-organisms
* Observe and represent characteristics of micro-organisms and explain how they meet their basic needs.
* Discuss the positive and negative impacts of micro-organisms on humans.
* Design and conduct an investigation of the factors that influence the speed of decomposition
* Compare cultural, scientific and historical explanations of disease
 |