



BEATY

BIODIVERSITY MUSEUM

Museum Vocabulary

Before visiting the Beaty Biodiversity Museum, we recommend that you review some of the terminology that we will use in the exhibits and with your students. The museum is broken down into six sections - the Cowan Tetrapod Collection, the Marine Invertebrate Collection, the Herbarium, the Spencer Entomological Collection, the Fish Collection, and the Fossil Collection. This document will define the important terms for your students to know in each collection. During your visit, our museum educators will be happy to define any terms you may be unfamiliar with in the exhibits - just ask anyone in a red vest for help.



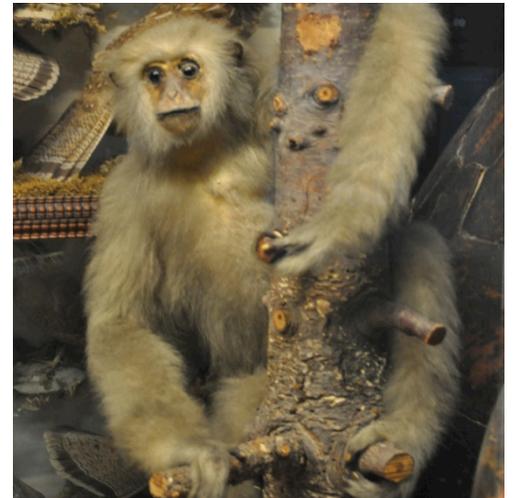
Photo: Artiom Shostak, Beaty Biodiversity Museum

The Cowan Tetrapod Collection

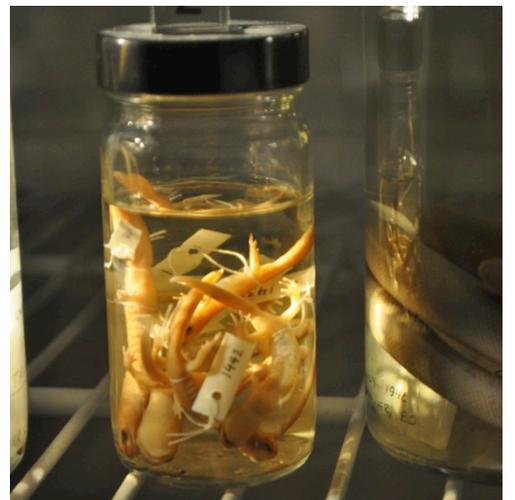
Tetrapod - A **tetrapod** is an organism with four limbs. This includes **mammals, amphibians, reptiles,** and **birds**. Some tetrapods in our collection have descended from organisms with four limbs, such as whales and snakes. While they do not appear to have four limbs, they are still considered tetrapods.¹



Mammal - A **mammal** is any organism that has hair or fur, and produces milk to feed their young from their mammary glands. Mammals may not have hair for their entire lives, but all mammals have at least a small amount of hair at some stage in their development. Mammals live in many different environments on Earth, including but not limited to oceans, forests, deserts, and the arctic.²



Amphibian - An **amphibian** is an organism that begins their life living in the water, breathing through gills. When they mature, they move onto land and breathe through lungs. An example of this is a frog - it begins its life as a tadpole in the water and then develops into a mature frog. This process is called metamorphosis. Amphibians are ectothermic, which means that instead of being able to produce their own heat internally they must rely on the environment to keep themselves warm.³



¹ Beaty Biodiversity Volunteer Training Manual

² Matthew Wund and Phil Myers. "What is a Mammal?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/mammals>.

³ Paul D. N. Hebet and C Michael Hogan. "What is an Amphibian?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/amphibians>.

Reptile – A **reptile** is an organism with scales instead of fur or feathers. They have dry, waterproof skin and lay eggs. Examples of reptiles include turtles, lizards, snakes, and crocodiles. Reptiles cannot regulate their body heat and therefore often bask in the sun to increase their body temperature or hide in burrows or in the water to decrease their body temperature.⁴



Bird – A **bird** is an organism with feathers, which can help them fly, stay warm, attract mates, and repel water. Birds reproduce by laying eggs. All birds have beaks and do not have teeth. They swallow their food without chewing. Most birds are able to fly, however a few species are flightless, such as the Kiwi. Birds have hollow bones, which makes flight possible.⁵



Marine Invertebrate Collection

Invertebrate – An **invertebrate** is an organism that does not have a backbone. In contrast, organisms with a backbone, or vertebrae, are called **vertebrates**. At the museum you will find several examples of marine invertebrates, including cnidarians (jellyfish, corals, and sea anemones), molluscs (snails, mussels, and squid), annelids (segmented worms), crustaceans (crabs, lobsters, shrimp and barnacles), echinoderms (sea stars and sea urchins), and poriferans (sponges).⁶



⁴ Paul D. N. Hebet. "What is a Reptile?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/reptiles>.

⁵ Jeff Betz and Cyndy Parr. "What is a Bird?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/birds>.

⁶ Katja Schulz. "What is an Invertebrate?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/invertebrates>.

Crustacean - Crustaceans are a group of arthropods, meaning they have a hard exoskeleton, segmented body, and jointed limbs. Nearly all crustaceans live in aquatic habitats, with the exception of animals like woodlice. Examples of aquatic crustaceans include crabs, lobsters, shrimp, barnacles, and copepods.⁷



The Herbarium

Herbarium - The **herbarium** is where all of the plant and fungi specimens are housed. All of the specimens are carefully dried and preserved. The specimens show variation and distribution information about different species and can demonstrate how species change over time. Scientists, ecological consultants, conservation managers, agriculturists, archaeologists, police, government agencies, and the general public use the herbarium to gather information.⁸



Plant - Plants are organisms that generally have limited mobility, cell walls containing cellulose, and are able to produce their own food. Plants make their own food through photosynthesis, which involves them converting carbon dioxide and energy from sunlight into sugar and oxygen. The study of plants is known as botany.⁹

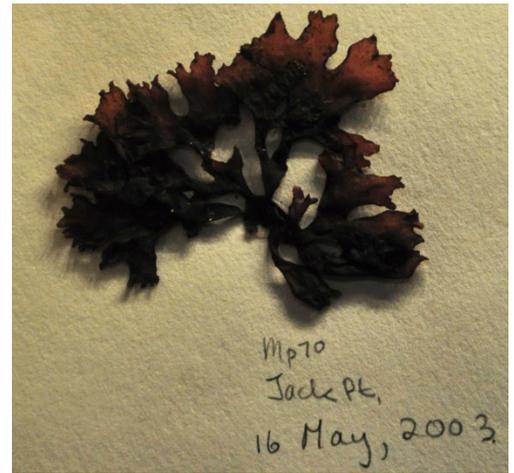


⁷ Beaty Biodiversity Volunteer Training Manual.

⁸ Beaty Biodiversity Volunteer Training Manual.

⁹ C Michael Hogan. "What is a Plant?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/plants>.

Algae - Algae are mainly aquatic organisms. They create their own food through photosynthesis. Algae are food for almost all aquatic life. They do not have true roots, stems, or leaves. Seaweed is an example of an alga that is widely eaten by humans.¹⁰



Bryophyte - A **bryophyte** is a non-vascular plant that reproduces by spores. This means that they do not have true roots and cannot transfer water and nutrients throughout. Instead they absorb nutrients directly into their leaves. Moss is an example of a bryophyte.¹¹



Vascular Plants - Vascular plants have specialized tissues and structures known as xylem and phloem. They bring water, minerals, and nutrients from the roots up into the stem and leaves of the plant. Flowering plants and conifers are both examples of vascular plants.¹²



¹⁰ Robert A. Anderson and Ralph A. Lewin. "Algae." Encyclopedia Britannica Online. Accessed June 17, 2013. <http://www.britannica.com/EBchecked/topic/14828/algae>.

¹¹ Tracy Barbaro. "Bryophytes." Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/pages/6358726/overview>

¹² C Michael Hogan. "What is a Plant?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/plants>.

Fungi - Fungi live in every habitat on Earth. They cannot move, nor can they produce their own food like plants can. Most fungi obtain their nutrients from dead organic matter and absorb their food through their cell walls. Some fungi are parasitic. They usually live on their feeding surface. Mushrooms are an example of this group.¹³



Lichen - Lichen is a symbiotic relationship between a fungus and an alga. They form together and cannot survive without the other. They generally form on tree limbs or rocks, but they have been known to live in a variety of habitats.¹⁴



The Spencer Entomology Collection

Entomology - Entomology is the study of insects. Examples include butterflies, spiders, and beetles. Insects are the most diverse group of animals on the planet - there are more than one million described species (and there is estimated to be millions more). Insects live in nearly all environments on Earth.¹⁵



¹³ University of Guelph. "What is a Fungus?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/fungi>.

¹⁴ Beaty Biodiversity Volunteer Training Manual.

¹⁵ Beaty Biodiversity Volunteer Training Manual.

Arthropod – An **arthropod** is a jointed limbed animal with an exoskeleton. An exoskeleton is similar to a suit of armor – it is a hard exterior that protects the animal. Arthropods are jointed to allow for movement. All **insects** are arthropods, but not all arthropods are insects. Other examples of arthropods include **arachnids** and **crustaceans**.¹⁶ Crustaceans are housed in the museum’s Marine Invertebrate Collection.



Arachnid - Arachnids include spiders, scorpions, mites, ticks, and harvestmen. Spiders live on all continents, and some are able to live on or in fresh water. Arachnids feed on living prey, which are usually insects. They are arthropods, meaning that they have a segmented body. Their body is divided into two segments – the cephalothorax (head) and the abdomen.¹⁷



The Fish Collection

Fish - Fish are animals that live and swim in the water, breathe using gills (with the exception of lungfish), have vertebrae, generally have scaly skin, and generally have fins instead of limbs. Fish are an important food source worldwide, which has resulted in many fish species being at risk.¹⁸



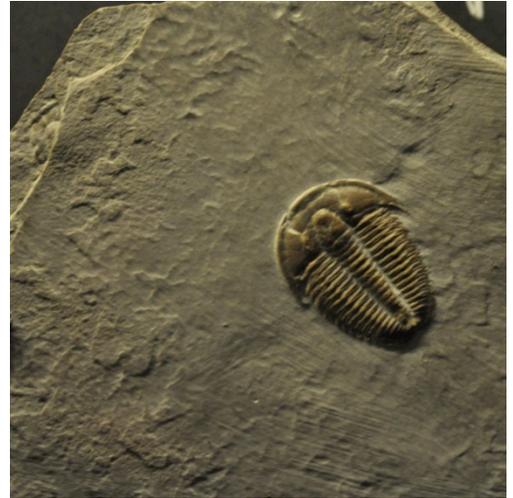
¹⁶ Beaty Biodiversity Volunteer Training Manual.

¹⁷ Herbert Levi. "What is a Spider?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/spiders>

¹⁸ Mark Westneat. "What is a Fish?" Encyclopedia of Life. Accessed June 17, 2013. <http://eol.org/info/fishes>.

The Fossil Collection

Fossil - A **fossil** is a remnant of an organism that has been preserved in the crust of the Earth. The hard parts of organisms, such as a shell or bone, may be preserved and fossilized over time. It is unlikely that a soft-bodied organism will fossilize, however there have been a few rare instances where this happened. Studying fossils can reveal a wealth of information about what life on Earth was like the past.¹⁹ The fossils in the museum's collection range from recent findings to 500 million year old fossils of blue-green algae.²⁰



Other Important Terminology

Adaptation - Organisms have **adaptations** that enable them to be better suited to their environmental conditions. If particular genes in an organism have certain advantages (such as reproductive success, camouflaged appearance, or defense) then these traits are likely more successfully passed on from generation to generation, which will make the species better adapted to their environment.²¹

Biodiversity - Biodiversity is the distribution and variety of relationships, organisms, and ecosystems on Earth. The biodiversity on Earth is constantly changing. The range of organisms we see today are much different from those 300 million years ago!²²

Habitat - A **habitat** is where an organism (or group of organisms) lives.²³

Specimen - A **specimen** is an organism that is used for studying or display. At the museum the specimens are no longer living and are carefully prepared for preservation. For some organisms, such as plants, they are dried and pressed. Other organisms, such as fish, are stored in alcohol. Museum specimens come from a variety of sources - some are found after they have died from injuries, some are donated, and some are collected directly.²⁴

¹⁹ "Fossil." Encyclopedia Britannica Online. Accessed June 17, 2013.
<http://www.britannica.com/EBchecked/topic/214511/fossil>

²⁰ Beaty Biodiversity Volunteer Training Manual.

²¹ "Adaptation" Encyclopedia Britannica Online. Accessed June 25, 2013.
<http://www.britannica.com/EBchecked/topic/5263/adaptation>

²² Beaty Biodiversity Volunteer Training Manual.

²³ "Habitat." Encyclopedia Britannica Online. Accessed June 17, 2013.
<http://www.britannica.com/EBchecked/topic/250816/habitat>

²⁴ Beaty Biodiversity Volunteer Training Manual.

Understanding the Museum

We recommend group leaders visit the museum prior to your first field trip to become familiar with the collections and types of exhibits. If this is not possible, our website (beatymuseum.ubc.ca) and flickr page ([flickr.com/photos/beatymuseum/](https://www.flickr.com/photos/beatymuseum/)) are great museum introduction tools.

Use one of the following introduction activities to help your students understand the collections within the museum. This could be done in the classroom before your field trip, or at the museum before or after your guided program.

Venn Diagrams:

Provide groups of students with images of organisms from two different collections (for example, an image of a dragonfly and an image of a toucan). Have them brainstorm similarities and differences between the two and document their thinking in a Venn diagram. The process can be repeated so that each group will discuss samples from all of the sections of the museum, or the students could present their findings to the class to share their understanding.

Classification Organization:

Facilitate a classification game in which each student will be assigned an image or a description of an organism. They will have to assemble into the correct collection groups based on their own inferences. For younger students, it could be beneficial to have them work in pairs.



Photo: Artiom Shostak, Beaty Biodiversity Museum

References

- "Adaptation." *Encyclopedia Britannica Online*. Accessed June 25, 2013.
<http://www.britannica.com/EBchecked/topic/5263/adaptation>
- Anderson, Robert A. and Ralph A. Lewin. "Algae." *Encyclopedia Britannica Online*.
Accessed June 17, 2013. <http://www.britannica.com/EBchecked/topic/14828/algae>
- Barbaro, Tracy. "Bryophytes." *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/pages/6358726/overview>
- Beaty Biodiversity Volunteer Training Manual
- Betz, Jeff and Cyndy Parr. "What is a Bird?" *Encyclopedia of Life*. Accessed June 17, 2013. <http://eol.org/info/birds>.
- "Fossil." *Encyclopedia Britannica Online*. Accessed June 17, 2013.
<http://www.britannica.com/EBchecked/topic/214511/fossil>
- "Habitat." *Encyclopedia Britannica Online*. Accessed June 17, 2013.
<http://www.britannica.com/EBchecked/topic/250816/habitat>.
- Hebet, Paul D. N.. "What is a Reptile?" *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/info/reptiles>.
- Hebet, Paul D. N. and C Michael Hogan. "What is an Amphibian?" *Encyclopedia of Life*.
Accessed June 17, 2013. <http://eol.org/info/amphibians>.
- Hogan, C Michael. "What is a Plant?" *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/info/plants>.
- Levi, Herbert. "What is a Spider?" *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/info/spiders>
- Schulz, Katja. "What is an Invertebrate?" *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/info/invertebrates>.
- University of Guelph. "What is a Fungus?" *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/info/fungi>.
- Westneat, Mark. "What is a Fish?" *Encyclopedia of Life*. Accessed June 17, 2013.
<http://eol.org/info/fishes>.
- Wund, Matthew and Phil Myers. "What is a Mammal?" *Encyclopedia of Life*. Accessed June 17, 2013. <http://eol.org/info/mammals>.