



Beaty Box

Educator's Manual



This Educator's Manual contains two sections. The first section (Beaty Box Basics) provides general information about Beaty Boxes, the Beaty Biodiversity Museum (BBM), and background information on natural history specimens. The second section contains lesson plans and information specific to the themed Beaty Box you have chosen.



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Beaty Box Basics

An Introduction to the Beaty Box and the Beaty Biodiversity Museum



BEATY
BIODIVERSITY MUSEUM

Welcome to the Beaty Box!

Thank you for choosing to borrow Beaty Biodiversity Museum's Beaty Box!

Inside this outreach kit you will find:

- Touchable museum specimens, labeled and safely mounted for travel
- An Educator's Manual with information on specimens, lesson plans, and a box inventory. This is also contained on the USB key included in the box, so you can print, make notes, and show photos on a projector.
- Supplementary educational information and materials including diagrams, photos, and activities
- Information and links to online resources

Background

Since opening in 2010, the Beaty Biodiversity Museum (BBM) has provided visitors with the memorable hands-on experience of exploring the University of British Columbia's (UBC's) collection of over two million natural history specimens. Unfortunately, not everyone is able to come to the BBM, which is why we have developed the Beaty Box program. It is our hope that increased accessibility to the BBM's biological collections will promote a greater understanding of biodiversity within the community.

Holding a fossil, feather, or shell in your hand allows people to understand it in ways that cannot be achieved through a computer screen does. Learning basic scientific skills such as close observation of specimens helps to narrow the boundary between citizen and scientist. Whether or not individuals become scientists, their experiences with the Beaty Box will increase their scientific literacy, empowering them to make more informed decisions about their future.



Goals

- To promote the BBM's vision of a world where biodiversity is better understood, valued, and protected through collections-based learning
- To reach more visitors per year than the physical museum through the use of Beaty Boxes in classrooms, libraries, community groups, and local nature clubs
- To support curriculum-based learning with touchable specimens and hands-on activities, enriching the student learning experience

Museum Specimens

Where Do Museum Specimens Come From?

The Beaty Box contains museum specimens that UBC has accumulated over many decades. There are three ways in which the BBM adds to its collections:

1. **Some specimens are found.** Animals that have died of injuries or disease may be added to the collections. The Beaty Museum's blue whale exhibit is a high-profile example of this type of addition – the condition of the blue whale's skull likely means it was struck by a ship off the coast of Prince Edward Island.
2. **Some specimens are donated.** The museum accepts specimens collected by researchers for research projects (primarily insects, spiders, plants, fungi, and fish). All projects and collection processes have undergone vetting and have been approved by Canada's national granting agencies. Members of the public have also donated specimens. For example, much of the marine invertebrate collection was acquired through donations from private collections.
3. **Some specimens are collected directly.** Some insect, spider, and plant specimens are collected directly, particularly if they can fill a void in the collections.



What Can Specimens Tell Us?

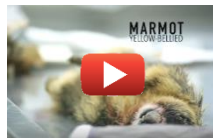
- The physical appearance of organisms can be used for identification, which has been essential to our survival throughout history (edible plants, dangerous predators, etc.)
- A record of what kind of life is around us and how variable it is in time and space
- Location data allows us to determine geographical ranges of each species
- Collection date allows us to investigate timing of different stages in a life cycle
- During preparation, other data is collected (i.e. stomach contents, wing span, any research tags, DNA samples, etc.)
- Studying specimens up close allows us to learn about their physical characteristics, like what adaptations they have to help them survive
- We can use specimens, along with new technologies, to gain insight on issues such as extinction, climate change, and urban planning

How Are Specimens Prepared?

- When items initially arrive at the museum they are placed into a large walk in freezer where the temperatures are kept at a frosty -30°C. Spending time in a freezer before and after preparation destroys potential pests and their eggs.
- Freezing specimens before they are brought into the museum is a chemical free way of controlling pests and disease, which helps keep our collection safe.

Furry, Feathery Tetrapod Specimens

- Research skins (birds, mammals, reptiles) are prepared at the museum's vertebrate lab. Workers take out the soft parts then stuff it with a combination of cotton and other dry materials.
- The specimen is sewed up, posed, and dried. This includes the use of round mounts, wing mounts and wire frame mounts to hold skins in place as they dry.
- Dermestid beetles may be used to clean the skeletons of small birds and mammals.
- Eyes are removed along with other soft body parts – the white material that you see is the cotton batting used to hold the shape of the prepared animal skin. Plastic eyes, like the ones used in taxidermy, do not provide researchers with information about the animal and thus are not used in scientific research skins.
 - Want to learn more about the preparation process? This Royal BC Museum (RBCM) YouTube video shows how a dead animal becomes a museum specimen. The same procedure used at RBCM is also used at the BBM.



Marmot | Royal BC Museum

www.youtube.com/watch?v=jf-RcVFfkws

- The BBM website also contains detailed presentations on preparing bird specimens, written by our own museum assistant curator.



Working with Birds | Beaty Biodiversity Museum

beatymuseum.ubc.ca/research-2/collections/cowan-tetrapod-collection/working-with-birds/

- *Please note: The animals shown in these presentations were salvaged. As these presentations deal with preparing skins from whole dead animals, some images may be considered graphic.*

Plants, Algae, Mosses and Fungi

- Researchers gather plant samples by cutting them in the field. They identify plants based on key characters like flowers or seeds. Researchers try to collect all of the important parts in a specimen – showing seeds, flowers, leaves, stems, and roots.
- Some plants are dried and pressed or kept in baggies/envelopes and shoeboxes.
- Plants that are pressed are placed on newsprints and pressed using layers of cardboard and wood. They are then placed in a dryer, with newsprints regularly replaced until the plant is completely dry. Once dried, plants may be affixed (glued or sewn) onto sheets of herbarium paper.

Shells, Bone, Fossils, and Other Hard Objects

- Hard objects are cleaned of all organic material and allowed to dry.

Entomological Specimens (Insects)

- Usually pinned, pointed, or placed in alcohol solutions.

Amphibians, Fish, Spiders, Marine Invertebrates

- Amphibians, some mammals, fish, and many marine invertebrates are usually found in jars filled with formalin and/or alcohol (isopropyl or ethanol).
- Spiders are preserved in alcohol due to their book lungs. The fluid fills in the lungs, keeping the abdomen expanded.
- Some fish have been specially preserved to make the flesh less visible. The bones of these specimens are stained a pink colour, while parts made of cartilage stain blue.



How Do I Talk About This With My Group?

If someone does mention that they feel uncomfortable about the specimens, acknowledge their discomfort in a positive way and take the opportunity to expand on their knowledge. Here are a few reasons that might make them feel better about the collections:

- The majority of museum specimens were found or donated after they have died from illness or injury.
- These collections have been accumulating slowly over many decades and, with proper care, will last hundreds of years.
- We can use these specimens to learn a great deal about the biodiversity around us with the main goal of understanding how best to conserve biodiversity.
- It is a chance for humans to learn from the organisms we share the planet with.

Explaining to young children:

- We can learn a lot from an animal by looking very closely at them, but living animals are very hard to study up close because they move or run away.
- When animals have accidents, or they get sick or old and they die, sometimes people who find them bring them to the museum. People prepare the animals in a special way so they last for a very long time – this way, people like you can look at them closely and learn something from them.

Specimen Labels

Each specimen has at least one blue label attached to it, like in the picture (right). Labels tell us:

- Which collection the specimen belongs to.
 - Most Beaty Box specimens belong to the Education and Outreach Collection. These are the blue labels.
- Common name
- Scientific name: will be underlined or in *italics*
- Accession number
 - This is a code that is unique to each organism or set of organisms. This allows us to keep track of each specimen: where it is kept, it's condition, and any background information in a database.
- Historical information
 - Look closely. Is there another label? At the museum, we never remove a label, only add more. That way, we have all the information we need.
- Extra information
 - Herbarium specimens have a big white label that includes information about where the plant was collected.
 - Other specimens may have this information saved in a database.



What happens if a label falls off?

- Tuck the label securely in with the specimen or as close as possible.
- Make a note and please let us know when you return the specimen.
- Do not throw it away!

Want to learn more about how our specimens are organized?

You can look at the main collections all online at

<http://beatymuseum.ubc.ca/research-2/collections/search-the-collections/>



Specimen Handling

Specimen care is very important because it is very easy for repeated actions to wear down specimens, particularly if someone is not guided in their handling. We cherish our specimens for what we can learn from them, as well as their beauty. Many are difficult to come by, and most require a great deal of work to collect, prepare, identify, catalogue, and maintain. Therefore, it is the educator's job to help students appreciate the specimens, while handling them in an appropriate manner. Showing students ahead of time how to interact with specimens is a good way to prevent mishandling.

Taking Specimens Out of the Beaty Box

- Specimens are arranged in individual layers/trays inside the Beaty Box. Please refer to the second section for a description of the different trays inside the box.
- Take care to remove one tray at a time. Some trays may be heavy, so use both hands for support and ask for assistance if needed.
 - Note: the bottom layer of some boxes may be stuck to the inside of the box and is not intended to be removed.
- Individual boxes containing specimens can be removed from each tray. **Please do not remove specimens from their foam-mounted boxes.** Instead, pass the whole box around for the children to hold.
- Always fully support individual specimens, supporting any weak spots and using strong spots to lift.
- Place the specimens on a safe and clean surface (away from direct sunlight) to protect the specimens from insects, dirt, dust, oils, sticky substances, heat, and moisture. Try to keep specimens above a table or near the floor so potential drops are will be less damaging.
- Use two hands or a cart to transport specimens when you are going any distance or changing floors.
- Check out our YouTube channel (<http://bit.ly/BeatyBox>) for Beaty Box unboxing videos. These will be helpful in visualizing how to remove and replace specimens/trays in and from the boxes. Also, be sure to have a look into our other Beaty Boxes and see what specimens are inside!



During the Lesson

Before interacting with specimens:

- If you aren't sure, have students practice with stuffed animals or on their own hands/arms.
- Prepare students before interaction with a specimen. Do you think they can handle a specimen appropriately?
 - **Demonstrate the pinky finger rule:** Get them to use their pinky finger to "pet" their opposite hand. Ask them to be gentle enough that they cannot feel the touch anymore. Then, talk about how to transfer this technique to specimens. If you just say "do it gently" it's hard for them to know exactly how gentle to be.
 - Having students sit down may be a good way to encourage gentle handling.
- **Always clean and dry your hands before and after specimen interaction.** This helps remove oils and dust from our hands to prevent contamination of specimens.
- Ensure that any food, beverages, and/or classroom pets are put away before the start of the lesson.

While Interacting with Specimens:

- Any open or exposed specimens are free for students to touch. Otherwise, jarred specimens and those that are sealed in plastic containers should not be opened.
- Help students out! Be friendly and suggest ways to improve handling if you notice someone handling specimens inappropriately. Continue to encourage the pinky finger rule.
- Do not leave specimens unattended.
- Never stack specimens on top of each other. Never stack other objects on top of specimens. Always use specified trays.
- Hold one specimen at a time when moving or passing them around. Sometimes it is possible to hold a small specimen in each hand, but it's generally better to use both hands to ensure you're supporting the whole specimen and reducing the risk of drops.

Furry, Feathery Tetrapod Specimens

- Hold the whole box to support the entire weight rather than holding it up from one spot – do **not** pick specimens up by the ears, feet, tails, or other appendages.
- Some birds have sticks to prevent tail feathers from being bent. Do not hold or move the birds by their stick. The stick is not designed to hold up the specimen and can poke or put pressure on the skins.
- Watch carefully when you allow children to stroke the skins, as they will often want to push the fur and feathers in the opposite way. Ensure they do not pluck or pull on ruffled feathers – ask them to "pet it gently the way you would pet a dog or cat".
- Watch that small parts that stick out like feet, ears, and tails are not knocked or pushed accidentally.

Bones, Skulls, Marine Invertebrates, Shells and Other Hard Objects

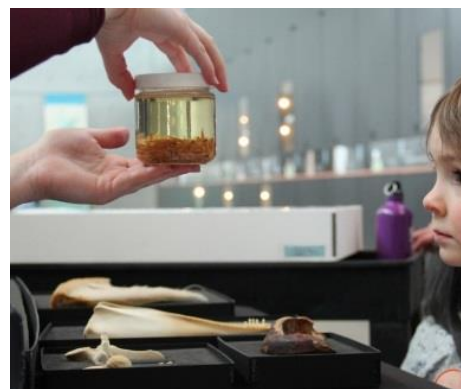
- These objects are very fine so it is better to demonstrate where and how to touch the specimen before interaction. Again, use the pinky finger rule!

Pinned Specimens (Insects)

- Do not flip specimens.
- Keep horizontal if possible; they can also be displayed at a maximum of a 45° angle using a support stand.
- Do not remove pinned specimens from their tray.

Jarred Specimens (Isopropyl Alcohol and Ethanol Alcohol Solution)

- *Note: Jarred specimens contain alcohol and are flammable.*
- Encourage students to leave large jars on the table when possible.
- Supervise the holding of jars, and try to hold them as short a distance as possible over the table in case of a drop. Do not hold over the floor.
- Jars should not be tipped - even if it looks like the lid should be watertight, liquid can leak out.
- In the case of a spill, place the glass, specimen, and any liquid you can salvage into a closed container. Use paper towels to mop up the alcohol (see FAQ section page 23).



Plants, Algae, Mosses, and Fungi

- Some plant specimens have a plastic cover – do not remove this cover!
- Stacking pressed plant sheets on top of each other is fine. Do not flip upside down.
- Hold the top and bottom corners of sheets with both hands for support.
- If you are looking through a stack, please remove one specimen sheet at a time and place it on another pile, rather than flipping like a book. This helps prevent delicate parts from breaking or falling off.
- Handle mosses, lichen, and fungi gently to ensure they don't fall apart.
- Touch the plants very delicately. Establish student ability to touch these specimens on a robust plant before allowing them to touch a more delicate one.
- Any algae preserved in glycerin (squishy and shiny) should not be touched directly.

Resin Casts and Petri Dishes

- These can scratch easily – don't let them rub against any surfaces. Lift to move them, do not drag.
- For resin casts, rest them on the side with little felt pads (stuck on one side).
- Most petri dishes are glued shut. Do not remove the adhesive, but allow students to flip it over and look at it from all sides.

What if I just can't get someone to handle it gently and think that they might damage the specimen?

- Physically demonstrate the gentle handling you want in a calm, delicate, quiet and explanatory manner so that the child has an opportunity to mimic your behavior. This allows them to get a sense of how fragile and precious the specimen is.
- Distract the child with a much more exciting and sturdier specimen. Make it exciting!
- Ask the child if you can look at the specimen that they are being rough with, and then replace it with another one.
- Remember that you are supervising the safety of the specimens so if you feel that the specimen needs to be taken away, then please go ahead and do so, while explaining positively and gently.
- If the group seems very excitable, try a body break, washroom break, or go outside for a snack. A few minutes of play will help children spend their extra energy before handling specimens.

After Interacting With Specimens:

- **Always clean and dry your hands before and after specimen interaction.** This removes residues and dusts that you may have picked up from the specimens.
- Make sure students know where and how to put the specimens away (e.g. leave it back on the table where they found it)
- Please put away all specimens at the end of the learning period and when taking a lunch break. This helps prevent any food (and pests) from reaching the specimens.

Putting Specimens Back Into the Beaty Box

- When reassembling the box, please follow the picture guideline on the base of each tray. This ensures everything will fit back together nicely.
- Carefully place one tray at a time in the correct order (the tray number can be found on the sides of each tray). Use both hands to support each tray.
- Please refer to the pictures in Section 2 when placing individual specimens back in their appropriate tray, ensuring that the arrangement is correct.



Beaty Box Vocabulary

Your Beaty Box contains many fascinating and unique specimens to help stimulate group discussions. Before using your Beaty Box, we recommend that you review some scientific vocabulary with your students, especially if it is relevant to your curriculum. Becoming familiar with this terminology, which is often used in the museum, can help you and your students make the most out of your hands-on learning experience. Try to encourage students to use this vocabulary during discussion and specimen interaction.

Biodiversity:

Biodiversity is the variety of life.

Biodiversity is the diversity, distribution, and genetic variation of organisms in an environment.

Biodiversity is the variety and relationships among all living things in the world.

Biodiversity is the range of genetic, species, and ecosystem diversity of the Earth's biosphere.

There are many different ways to define biodiversity – try having students share their own definitions.

Specimen:

A specimen is an organism that is used for studying or display. The specimens in the Beaty Box 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.

Adaptation:

An adaptation is any structural or behavioural characteristic of an organism that makes it better suited to its environment, improving the organism's chance of survival and reproductive success.

Habitat:

A habitat is where an organism (or group of organisms) lives.



Tetrapods

Tetrapod:

Tetrapods are vertebrate animals that have, or possess ancestors that had, four limbs. The tetrapods are amphibians, reptiles, birds, and mammals.

Mammal:

A mammal is an organism that has hair or fur, and produces milk to feed their young from their mammary glands (e.g. humans, whales, squirrels).

Amphibian:

An amphibian is a cold-blooded tetrapod that begins their life in the water, breathing through gills. When they mature, they move onto land and breathe through their lungs (e.g. frogs, salamanders).

Reptile:

A reptile is a cold-blooded organism with scales instead of fur or feathers. They have dry, waterproof skin and lay eggs (e.g. turtles, lizards, snakes).

Bird:

A bird is an organism with feathers, which can help them fly, stay warm, attract mates, and/or repel water. All birds have beaks and reproduce by laying eggs (eg. hummingbirds, penguins, seagulls).



Marine Invertebrates

Invertebrates:

An invertebrate is an organism that does not have a backbone. In contrast, organisms with a backbone, or vertebrae, are called vertebrates.

Poriferans:

Poriferans, or sponges, are immobile, water-dwelling filter feeders, meaning they pump water through their bodies to filter out food.

Echinoderms:

Echinoderms are marine organisms with a water-vascular system characterized by a hard, spiny skeleton and a radial body (e.g. sea stars, sea urchins).

Annelids:

Annelids are worms with long, segmented bodies that can be found in terrestrial and marine environments (e.g. earthworms, leeches).

Molluscs:

Molluscs are organisms that have soft, unsegmented bodies with a protective shell (e.g. snails, clams, squids).

Cnidarians:

Cnidarians are marine organisms with radially symmetrical bodies, stinging cells, and a saclike body with a single opening for eating food and eliminating waste (e.g. corals, jellyfish).

Crustaceans:

Crustaceans are organisms that have a hard exoskeleton, segmented body, and jointed limbs (e.g. crabs, barnacles, shrimp).



Herbarium

Plants:

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.

Herbarium:

A collection of dried plants, fungi, algae, and lichen that are mounted, labeled, and systematically arranged for use in scientific study.

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 (e.g. cedar, grass, ferns, roses).

Bryophyte:

A bryophyte is a non-vascular plant. This means that they cannot transfer water and nutrients throughout their system, instead they must absorb nutrients directly into their leaves. Bryophytes reproduce by spores and include mosses, hornworts, and liverworts.

Algae:

Algae are aquatic, photosynthetic organisms that do not have true roots, stems, or leaves. Algae are not plants, but are stored in a herbarium collection (e.g. kelp, seaweeds, *Volvox*).

Fungi:

Fungi play a vital role in most ecosystems by obtaining their nutrients from dead organic matter. Fungi include mushrooms, yeasts, and molds. Fungi are not plants, but are stored in a herbarium collection (e.g. reindeer lichen, sunburst lichen).

Lichen:

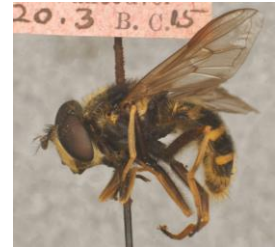
Lichen is a symbiotic relationship between a fungus and an alga, generally forming together on tree limbs or rocks. Lichen are not plants, but are stored in a herbarium collection.



Entomology

Insect:

An insect is an arthropod animal of the class Insecta, having an adult stage characterized by three pairs of legs and a body segmented into head, thorax, and abdomen and usually having one or two pairs of wings. (eg. bees, beetles)



Arthropods:

Arthropods are jointed limbed animals with an exoskeleton that protects the animal. All insects are arthropods, but not all arthropods are insects. Other examples of arthropods include arachnids, millipedes, and crustaceans.

Entomology:

Entomology is the study of insects. The BBM Entomological collection contains insects, spiders, and other terrestrial (land-dwelling) arthropods.

Arachnid:

Arachnids include spiders, scorpions, mites, ticks, and harvestmen. Their body is divided into two segments – the cephalothorax (head) and the abdomen. Arachnids feed on living prey, which are usually insects.

Fish

Fish:

Fish are animals that live and swim in the water, breathe using gills (with the exception of lungfish), have vertebrae, usually have scaly skin, and generally have fins instead of limbs.

Fossils

Fossils:

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. Studying fossils can reveal a wealth of information about what life on Earth was like in the past.

References

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"Cnidarian." *The Free Dictionary*. <http://www.thefreedictionary.com/cnidarian>
"Riker mount." *Merriam-webster*. <http://www.merriam-webster.com/dictionary/Riker%20mount>

The Beaty Biodiversity Museum

Showcasing UBC's biological collections and research



604.827.4955

2212 Main Mall

Vancouver, BC Canada V6T 1Z4

Hours: Tuesday to Sunday 10:00 a.m. – 5:00 p.m, closed Mondays and Statutory holidays

The Beaty Biodiversity Museum strives to inspire an understanding of biodiversity, its origins, and importance to humans through collections-based research, education and outreach. To engage with our visitors, we host programming that interprets our permanent collections and the content of the museum. This includes lecture series, scavenger hunts, videos, tours, crafts, discovery lab programming, and other activities.

Explore the university's spectacular biological collections, with 20,000 square feet showcasing over 500 permanent exhibits. Among our two million treasured specimens are a 26-metre-long blue whale skeleton suspended in the atrium, the third-largest fish collection in Canada, myriad fossils, and shells, insects, fungi, mammals, birds, reptiles, amphibians, and plants from around BC and across the world.

Collections

Cowan Tetrapod Collection



With over 40,000 specimens representing over 2,500 species, the collection is the second-largest scientific collection of birds, mammals, reptiles, and amphibians in British Columbia. Important specimens representing global biodiversity are also housed here including the rare red panda, endangered Vancouver Island marmot, and even extinct species, such as the passenger pigeon.

The Blue Whale Specimen

Blue whales are the largest animals ever to have lived on earth. Worldwide, only 21 are available to the public for viewing. The BBM is home to Canada's largest blue whale skeleton (26 metres), a magnificent specimen that illustrates the interconnectedness of all living things.



Marine Invertebrate Collection



The Marine Invertebrate collection houses several thousand specimens representing the major lineages of invertebrate animals and includes some spectacular examples of global marine biodiversity such as giant clams and some rare species of cowries.

The UBC Herbarium



A herbarium is a taxonomically and geographically organized collection of preserved plants, algae, lichens, and fungi. The Herbarium holds more than 650,000 specimens and is the largest herbarium in Canada, west of Ottawa. The herbarium collections include land plants—mosses, ferns, conifers, flowering plants as well as their relatives—as well as algae, lichens, and fungi.

The Spencer Entomological Collection



The collection today holds over 600,000 specimens and is the second-largest entomological collection in western Canada. It contains numerous holotype specimens, such as the planthopper *Achrotile distincta*, and historical specimens of species that have disappeared from the province, such as the viceroy butterfly (*Limenitis archippus*), last collected in Lillooet in 1930.

The Fish Collection



The Fish Collection holds over 800,000 specimens and over 50,000 DNA and tissue samples, making it the third-largest fish collection in Canada. The collection holds 11 holotype specimens, which are original specimens that were used to describe new species. It also contains representatives of what may be the youngest fish species on Earth: pairs of stickleback species that evolved only recently in British Columbia's lakes.



The Fossil Collection



The collection contains over 20,000 specimens, ranging from recent shells and Neanderthal stone tools to traces of cyanobacteria that represent some of the oldest evidence of life on Earth. The collection includes specimens about 505 million years old from the famous Burgess Shale in eastern British Columbia, to fossils from all over the world.

UBC Scientists and their Research



To understand and conserve the diversity of life on earth through research, education, and outreach.

Website: biodiversity.ubc.ca

Twitter: @UBCBiodiversity

Research Focuses

Scientists at UBC's Biodiversity Research Centre (BRC) investigate the ecology, evolution, and conservation of biological diversity through research at all levels. Research focuses include:

- Community Ecology
- Comparative Genomics
- Ecosystem Services and Conservation Policy
- Environmental Change
- Evolutionary and Ecological Theory
- Marine Biodiversity
- Microbial Diversity and Evolution
- Plant Evolution
- Population Ecology
- Speciation Research
- Systematics and Phylogenetics

As the scope of global climate change, human-caused habitat alterations, and associated extinction rates rise, the need to understand and conserve biodiversity, and the ecosystem functions that it sustains, has never been more pressing. To learn more, explore our online exhibit Researchers Revealed (beatymuseum.ubc.ca/researchers-revealed/).



First Peoples' Knowledge and Perspectives: Resource List

The Beaty Museum strives to incorporate unappropriated First Peoples' perspectives and partnerships within our museum collections, exhibits and activities. The BC curriculum aims to include Indigenous ways of knowing into teaching and learning. We understand the importance of bringing this content into the classroom and therefore have compiled resource materials that facilitate implementation and build greater understanding of First Peoples' knowledge and perspectives on biodiversity. We are continually looking to find more resources to add to our list, please check our website for updated content: (<https://beatymuseum.ubc.ca/learn/educator-resources/first-peoples/>).

At the Beaty

Culture at the Centre:



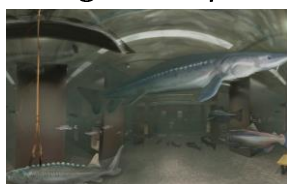
A permanent display at the Beaty Museum that aims to demonstrate the interconnectedness of language, land, and culture. Follow stories that connect six communities to their territories, represented through five cultural centres: Musqueam, Squamish, Lil'wat, Heiltsuk, Nisga'a, and Haida. beatymuseum.ubc.ca/culture-at-the-centre/

Herring Song:

As one part of the *Culture at the Centre* exhibit in collaboration with Heiltsuk Cultural Education Centre. Learn about the significance of herring to the Heiltsuk people through information and song.

zoology.ubc.ca/~biodiv/culture/herring.html

Sturgeon Harpoon Knowledge Web:



The Beaty Museum collaborated with sec̓ələnəx̓w Morgan Guerin, Musqueam Knowledgeholder/Aboriginal Fisheries Officer and the Musqueam First Nation to create an informational website with videos and interactive tools to illustrate the use and creation of a sturgeon harpoon.

beatymuseum.ubc.ca/sturgeon

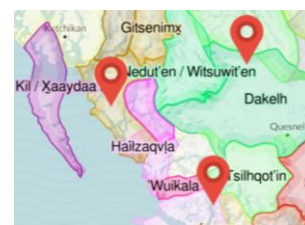
Other Resources

First People's Map

The First Peoples' Cultural Council has launched an interactive online map of British Columbia that represents Indigenous language, culture and places. Information of language regions, cultural landmarks, and heritage are provided in this living and growing resource. Find audio pronunciations of greetings, Indigenous stories and images/videos of First Nations art.

- Additional information on First Nations artwork and practices are displayed on a second interactive map (<https://www.fp-artsmap.ca/>)

maps.fpcc.ca/



First Nations Education Steering Committee FNESC



FNESC is a First Nation led collective focused on advancing quality education for all First Nations learners. Their website describes the work they do and offers current information about available programs, updated government policies and education issues.

- They have a free downloadable - *Science First Peoples Teacher Resource Guide* (fnesc.ca/sciencetrg/) for grades 5-9. That is designed to assist science teachers in recognizing and including First People's perspective in science inquiry. They also have a version (fnesc.ca/learningfirstpeoples/k-3/) for K-grade 3
- They also offer a list of authentic classroom resources (fnesc.ca/learningfirstpeoples/)

www.fnesc.ca

Indigenous Educational Resources – BC's Curriculum

The resources found on this site are compiled by the BC Ministry of Education in collaboration with other groups.

- It includes a inventory list of books, articles, websites, videos and more, with descriptions and information on how to access them (curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/indigenous-resources-inventory.pdf)

<https://curriculum.gov.bc.ca/curriculum/indigenous-education-resources>

First Voices



First Peoples' Cultural Council of BC created FirstVoices, an online Indigenous language archiving and teaching resource. Each section regarding a First Nations Language is accompanied with information, games and photos.

- There is also a version designed for children (www.firstvoices.com/kids)
www.firstvoices.com/explore/FV/sections/Data/

BC Educational Resource Acquisition Consortium (ERAC)

ERAC's website offers a multitude of tutorials and videos to help create an entry point into Indigenous education.

- Under the *Education and Curriculum* menu, there is an *Aboriginal Education Resources* tab that connects to different integrated lesson plans.
- The site also has a link to an evaluated, authentic, resource collection (<https://k12.bcerac.ca/?Curated=aboriginal>)

bcerac.ca/supports-tutorials-videos-guides/

School District Sites

Multiple district webpages have teaching resources, lesson plans, and video to support Indigenous perspectives

- School District No. 34: Abbotsford (indigenous.abbyschools.ca/)
- School District No. 50: Haida Gwaii (sd50.bc.ca/aboriginal-education/)
- School District No. 52: Prince Rupert (sd52wap.wixsite.com/abed)

Find the Beaty Biodiversity Museum Online!

Website:

Visit our website to find out more about Beaty Biodiversity Museum's biological collections, exhibits and research. Our website also offers information on school and group programs in the museum, along with educator resources to support classroom learning before, during, or after your visit.

beatymuseum.ubc.ca



Blog:

Check out our blog for news and events happening in the museum, stories about our collections, and much more!

beatymuseum.ubc.ca/blog

For Educators:

Educator Resources:

Our website contains a number of supplementary resources to help add to your Beaty Box experience. These museum-developed activities, which include worksheets and nature guides, are a great resource for bringing the museum experience into your classroom.

Educator Resources



Educator Resources | Beaty Biodiversity Museum

beatymuseum.ubc.ca/learn/educator-resources/

Educator Newsletter:

Sign up for our Educator Newsletter to receive updates about new educator resources, pilot programs, and special teacher offerings in the museum.

beatymuseum.ubc.ca/learn/educator-newsletter

Social Media:

Don't forget to use #beatymuseum to share your experience!

Youtube:

Our YouTube channel is a public archive of past lectures and nature videos that can help compliment your Beaty Box lessons

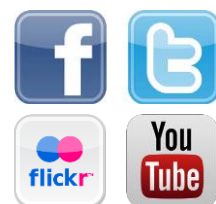
youtube.com/user/beatymuseum

Twitter: @beatymuseum

Facebook: facebook.com/beatymuseum

Instagram: instagram.com/beatymuseum

Flickr: flickr.com/photos/beatymuseum



Frequently Asked Questions (FAQ)

How big is the Beaty Box?

The approximate dimensions of the Beaty Box can be found in Section 2 of this manual (refer to the Section 2 Table of Contents).

Are the specimens real?

The majority of the specimens inside the Beaty Box are real, unless otherwise noted. (An exception is the whale bone Beaty Box).

Are the specimens alive?

No. All of the specimens inside the Beaty Box have been preserved so that others can look at them closely, allowing us to learn and gather information from them. Please refer to page 6 for ideas on how to respond to someone that shows discomfort to this subject.

Where do you get the specimens from?

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. See page 4 for a full discussion of museum specimens at the BBM.

How are specimens prepared?

All specimens inside the Beaty Box have been carefully prepared in the museum laboratories. For detailed descriptions of specimen preparation and preservation methods, please see page 4.

Why don't the tetrapod specimens have eyes?

Plastic eyes, like the ones used in taxidermy, do not provide researchers with information about the animal and are not used in scientific research skins. Thus, the tetrapod's eyes are removed along with other soft body parts. The white material that you see is the cotton batting that is used to hold the shape of the prepared animal skin.

What is the difference between a bone and a fossil?

Children sometimes interchange the terms fossil and bone when referring to specimens. A fossil is a remnant of an organism that has been preserved in the crust of the Earth. Either the hard parts of organisms, like shell and bone, or traces of animals, like tracks, can be preserved. Bone is calcium-based organic material and is porous; it makes up skeletal structure in most vertebrate animals.

What do I do if a specimen breaks?

Don't worry – these things happen! In the case of a specimen break, try not to let students handle the specimen any further. Simply place the pieces inside a zip-top bag and return them inside the Beaty Box. Do NOT throw anything out.

It's important for us to know how the specimen was broken in order to improve the safety standards of future Beaty Boxes. Please send us a detailed email (bookings@beatymuseum.ubc.ca) or call us (604.827.4955) if an incident occurs, and we will give you further details to proceed.

What if a jarred specimen spills?

If your Beaty Box has a jarred specimen, there will be a package at the end of your manual with safety and cleaning procedures. Please refer to that package for more complete information. Jarred specimens usually contain formalin and/or alcohol, so they are flammable. To clean up a spill:

1. Clear the area immediately and ensure that students are not stepping on broken glass.
2. Find another jar or closed container to place the specimen in. Wear gloves or use a paper towel to protect your hand, then place the labels, specimen, and any liquid you can salvage into the container. Keep the container with the salvaged specimen away from public space and return it inside the Beaty Box. A plastic screw-top jar works well. A zip-top bag can work, too.
3. Pick up any large pieces of broken glass carefully and dispose of them as glass waste.
4. Use paper towels to mop up some of the alcohol and dispose of them in the regular garbage outside of public space (the odour will be very strong).
5. Mop up the area and rinse thoroughly with water to remove any remaining residue.

It's important for us to know how the specimen was broken in order to improve the safety standards of future Beaty Boxes. Please send us a detailed email (bookings@beatymuseum.ubc.ca) or call us (604.827.4955).

What if I lose a specimen?

Please email us (bookings@beatymuseum.ubc.ca) or call us (604.827.4955) providing details about which specimen was lost. If you still have the empty specimen box with you, please place it in the appropriate tray inside the Beaty Box.

Will I be charged if I lose or break a specimen?

Depending on the scope of the damage, you may be charged for losing or breaking a specimen. Your booking confirmation sheet outlines our policy on lost or damaged specimens.

Where can I find additional worksheets or resources?

The BBM website provides some additional worksheets and resources for educators, which can be found at beatymuseum.ubc.ca/learn/educator-resources/. These activities were designed by museum staff to introduce the museum to your classroom, explore concepts and vocabulary, or wrap up a visit to the museum. Additionally, Section 2 of this manual lists some videos and websites relating to the specific activities at the end of the lesson plan.

What if I want to continue using the Beaty Box past its loan period?

If you would like to extend your group's time with the Beaty Box, please email or call the BBM to inquire about availability or make arrangements. Additional charges will apply.

Contact us

Beaty Biodiversity Museum

2212 Main Mall

Vancouver, BC Canada V6T 1Z4

Tel 604 827 4955

Fax 604 822 0686

Email: info@beatymuseum.ubc.ca

Returning the Beaty Box Checklist

Before returning our box to the museum, please look over the list below to ensure that you have completed the following:

- ☐ Look over the box inventory in the second section of this manual.
Are any specimens missing?
 - If yes, please take note of this and let us know by email (bookings@beatymuseum.ubc.ca) or phone (604.827.4955)
- ☐ Check the condition of each specimen. Any broken/missing parts?
 - If yes, please take note of this and let us know by email (bookings@beatymuseum.ubc.ca) or phone (604.827.4955).
- ☐ Are all of the jarred specimens sealed tightly before being placed inside the box?
- ☐ Are the specimens arranged according to the photographs on the base of each tray and the 'Repacking Your Beaty Box' photos in the second section of this manual?
You shouldn't have to force it closed!
- ☐ Is the Teacher Feedback Form filled out?
- ☐ Is the Beaty Box sealed and packed safely for transportation? *Please note that the Beaty Box is not waterproof. Please cover it with a towel, piece of plastic, or large garbage bag if it is raining during transport.*

If you have successfully completed this checklist, you are ready to return the Beaty Box. Please return the box to the front desk of the Beaty Biodiversity Museum during regular museum hours. We will review the Condition report together upon return of the box. Thank you for using the Beaty Box!

