



Grade

4-7

The Art of Observation and Inquiry

This lesson provides students with the opportunity to develop and enhance the valuable skill of scientific inquiry. This investigation involves gathering, recording and communicating observations for a chosen animal. Through this process, students gain an in-depth understanding of their chosen animal - from investigating specific adaptations and behaviors to making inferences about the animal's life history and beyond. Students will be challenged to think critically about how their animal interacts within its ecosystem and how humans can impact these interactions.

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- S**tudents Will Be Able To:
- [1] make close, careful observations of animals
 - [2] clearly and descriptively communicate these observations in their journal
 - [3] make inferences about characteristics of these animals and ecosystem interactions
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LEARNING

ENVIRONMENT

- ★ Individual learning in small groups

MATERIALS

- ★ Journal/Note book with observation cues pre-cut and stuck in
- ★ Pencil
- ★ Drawing materials
- ★ Watch and stopwatch
- ★ Folding measuring tape

Steps

There is an art to observation, which is covered in more detail in the "Helpful Information" section, as well as instructions for preparing student journals. Pre-teaching the relevant skills of drawing and writing descriptively in journals is essential to the success of your students while at the Aquarium.

This unique activity involves students spending time exploring the galleries, selecting one animal to observe for an extended period and then working independently to engage in descriptive scientific journaling.

- 1) Exploring the Vancouver Aquarium (30-45 min). For this lesson, we strongly recommend allowing the students time for free exploration. The Aquarium is a highly stimulating

environment and if students are not given this time to roam and discover then they may be distracted and overexcited throughout the more structured part of this lesson. This also provides a chance for students to tune-in to the theme of the lesson so remind them that this time is also for carefully selecting one animal for structured observation. This also gives students the opportunity to get an overview of their surroundings and become familiar with the space to be able to work independently with confidence. **TIP:** a) Make sure to lay out careful considerations for choosing an animal. For example, a fish will move around a lot, a sea star will not. Remind students to watch the animal for a few minutes to make sure that it is something they want to sit and observe. b) There are certain animals, like the belugas that are very popular among students this age. Have students pick their top two animals, for you as the teacher to make the final decision and to avoid overcrowding at one exhibit.

- 2) **Regroup (15 min).** Meet as a class in the pre-arranged meeting spot (see the section “Helpful Information” for tips about meeting spots) and discuss what students have discovered so far. What animal did they find most interesting? Why? Did anyone change their mind after watching an animal for a period of time? Have students choose their favourite animal and determine which gallery each student will be located throughout the observation process and group students accordingly. You may need to have students select their second choice to avoid overcrowding. Remind students that as this task involves the scientific process – they might not get all the answers they are looking for, or have enough time to complete every section of their journal. What's more important is that what they do complete is detailed and accurate. They should be given time back at school to fill in any “blanks” and research further. **TIP:** Outline times for group check-ins to ensure students are on task and focused. Each group should have a watch – designate a group member to monitor time for check-ins. They are responsible for their group members. Have a chaperone accompany them where available.
- 3) **Observation Time (30-40min).** Students now sit and observe their animal for a specified amount of time. This is where the practice comes in; if they have never observed before, they may not devote enough time to making the connections that are the most important part of this activity. The longer the students can observe, the more they will get out of the exercise. Encourage them to record their observations using both writing and sketching. Their pre-prepared journal questions will guide them in this process. **TIP:** Observation may be more

challenging for some students than others. The pre-prepared journal questions can be modified depending on the needs of your students.

- 4) **Class sharing and reflection on-site (10min)**. Return to the pre-arranged meeting spot and discuss what students have learned from their observations and some interesting things they observed the animal doing.
- 5) **Enjoy the rest of your visit!**

Helpful Information

Pre-visit Preparation: Observation is a skill that gets better with practice. To ensure your students are fully supported in this investigation, we recommend establishing ongoing opportunities for your students to investigate natural phenomena and develop skills of observing and communicating in the classroom. Have the students practice observing: the classroom pet, younger children, insects in the school yard, a clip from a movie with the sound off, etc. Encourage the students to use all of their senses. Observations can take the form of poetry, dialogues, stories, notes, drawings or anything else the students may want to try to get their thoughts on paper. Lessons focused specifically on drawing, descriptive journaling and opportunities for you as the teacher to model journaling will all support the students in their visit to the aquarium.

Journal Preparation: Spend time preparing your journals for your visit to the aquarium. Get students to copy the observation questions (below) onto individual pages in their books [greener option] or copy, cut and paste into their books.

Aquarium Meeting Spot: The Vancouver Aquarium can be a busy place so locating a pre-arranged meeting space for your class is essential to reinforce learning during your visit. Some spots to consider include the Underwater Dolphin and Arctic Galleries, the Exploration Gallery, and outdoors, weather permitting.

Extension Activities

- The following guiding questions can be utilized for early finishers at the Aquarium or back in the classroom:
 - What response do visitors have to your chosen animal?
 - A scientific drawing of your animal's habitat.
 - Multi-sensory: Use all of your senses – imagine what your animal might smell, feel and sound like?
 - Have the students do a research project on their chosen animal, making sure to include the following: where does it fit into the ecosystem? what is its habitat like in the wild? why is it important? is it threatened or endangered? what does it need to survive and what adaptations does it have in order to survive in its ecosystem?
 - Creative writing: A day in the life of (your animal)

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Grade 4

Science:

- The ways organisms in ecosystems sense and respond to their environment.
- Environment interdependence and adaptations.
 - o How they structurally and behaviourally adapt to their ecosystem.
 - o How they respond to changes in their environment.

Grade 5:

Science:

- The nature of sustainable practices around BC's living and non-living resources.

Grade 7:

Science:

- Natural selection through adaptive radiation - a proposed mechanism of the theory of evolution.
- Survival needs and interactions between organisms and the environment.
- Evidence of climate change over geological time and the recent impacts of humans.
- Sustainability of systems and First Peoples' principles of interconnectedness.

These Prescribed Learning Outcomes (PLOs) are related to sustainability & the environment as per the BC Ministry of Education Framework, Environmental Learning and Experience Curriculum Map: Complexity, Aesthetics, Responsibility and Ethics.

Observation Cut and Paste Cues

Select the following observation activities that fit with your student group. Cut and paste select activities directly into student journals or have them write them directly into their journals [greener option].

My Chosen Animal at the Vancouver Aquarium:

1. Common name:
2. Scientific (*latin*) name:
3. Location in the Aquarium:
4. Origin:
 - Which country/continent is it from?
 - Which climate is it from? Eg) Temperate, tropical, arctic

Movement:

How does my animal move? Which parts of its body does it use? What shape are its fins/arms/feet?

Sketch the swim/movement pattern of your animal....

(you may want to use blank paper and a pencil to trace movement as you watch for a certain period of time)

Adaptations:

What special features (adaptations) does my animal have to help it to survive?

- a. From looking at its mouth – what might it eat?
- b. How does it protect itself?

A sketch of your animal and labeling of anatomy...

<p>A “zoomed-in” sketch of the body covering of your animal...</p>
<p>Interactions: Does my animal interact with any living or non-living things in its habitat? How?</p> <p>A pastel/pencil crayon artistic scene of your animal and its habitat...</p>
<p>Food chain: Where in the food chain might my animal be? Does it have the features of a predator, prey or both? Is there evidence of food remnants?</p> <p>Do humans use my animal in any way? Is it sustainable? (Will it be around for future generations?)</p>
<p>Oxygen: What organ does my animal use to breathe? Are there gill slits? Does it breathe in the air with lungs? Can I see it take a breath? How many times per minute does it happen?</p>
<p>Locomotion: How long does it take my animal to move (swim, crawl, walk) 1 metre?</p>
<p>Vocabulary Bank.... (Write new, unfamiliar and words related to your animal here)</p>
<p>Impacts: Are there any threats to my animal in the wild?</p>
<p>Questions about my animal....</p>