

Great Bear Rainforest Activity Plan

Inquiry:

How is technology used for research in the Great Bear Rainforest?

Students create inquiry questions on what technologies are used to study life forms in the GBR. They research one question and present their findings to the class.

Learning Objectives

Students will:

- Identify technology that is being used to research animal and/or plant life in the Great Bear Rainforest
- Design a research study
- Present their research findings

Preparing for the Activity Plan

Note: This activity may take several classes to complete.

Materials

- computer / projector
- student computers / tablets / devices
- access to Internet
- poster paper and markers

Background Information

Biodiversity research being conducted in the Great Bear Rainforest region:

Great Bear Hydrophone Network (Pacific Wild)

<https://pacificwild.org/audio/>

Climate Kids

<https://climatekids.nasa.gov/>

Great Bear Sea > Elementary > Lesson 3: Collaborative Research – Case Study on Bears

Includes information on collaborative research.

<http://greatbearsea.net/elementary-curriculum/lesson-3/>

Great Bear Sea > Secondary Environmental Science > Lesson 3: Great Bear Sea Case Studies

Includes case studies on kelp forests, bear, pacific herring, and cumulative effects on the North Coast (analysis of impacts of forestry, fisheries, LNG pipelines, LNG refineries and wind power mega-projects), and clam gardens.

<http://greatbearsea.net/environmental-science/lesson-3/>

Hakai Institute

<https://www.hakai.org/>

Identification of Habitat of Special Importance to Fin Whales (*Balaenoptera physalus*) in Canadian Pacific Waters

Fin whale tagging in Caamaño Sound (DFO)

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_039-eng.html

Managing Salmon for Wildlife (Raincoast Conservation Foundation)

Information on hair traps and the Salmon Carnivore Program

<https://www.raincoast.org/salmon-carnivore-project/>

NEMES (Noise Exposure to the Marine Environment from Ships)

<https://nemesproject.com/>

Oceans Network Canada

Kitamaat Village Community Observatory

<https://www.oceannetworks.ca/learning/ocean-sense/community-observatories/kitamaat-village>

Research Methods (Spirit Bear Research Foundation)

Information on motion sensor cams

<https://spiritbearfoundation.com/research/researchmethods/>

Research on the Central Coast (Biodiversity of the Central Coast)

<https://www.centralcoastbiodiversity.org/research.html>

Tracking grizzly bears from space – David Laskin (4:14)

<https://ed.ted.com/lessons/tracking-grizzly-bears-from-space-david-laskin>

Delivering the Activity Plan

Access Prior Knowledge

- Have students think-pair-share “biodiversity of the Great Bear Rainforest.”
- Ask students how many life forms they can name.
- If students are unfamiliar with asking powerful questions (or perhaps have forgotten), discuss what makes an inquiry question vs. a fact retrieval question.

Inquire

- Show students the following video:

Great Bear Wild – Dispatches from a Northern Rainforest (5:33)

An introduction to the Great Bear Rainforest.

<https://vimeo.com/108089318>

- Distribute posters and markers around the classroom with headings such as:
 - » Lower plants (ferns, mosses, lichens, fungi)
 - » Higher plants (trees, fruit-bearing shrubs)
 - » Marine life
 - » Mammals
 - » Birds

Note: Headings are at the teacher’s discretion. More posters can be added, such as marine invertebrates, marine mammals, fish, etc.

- Students rotate through the “stations” adding “powerful” (how, why, what if) questions about the organism group listed on each poster. Encourage the students to think outside the box: what do they wonder about or want to know more about?
- Have students rotate through all of the stations once. Ask the students to go through a second time, adding more questions or refining previous questions.

Experience

- After the poster activity, have a gallery walk where students write down the question from each poster that most interests them (or a question that they have come up with on their own during the activity).
- Students should now have a list of interesting questions for critical inquiry to choose from for the next step.
- As a class or in small groups, discuss:
 - » What did they know about the question before?
 - » What did they learn from their peers?
 - » What do they still wonder about?

Explore

- Students choose a question from the gallery walk or write a new question to research. Questions may need refining to focus on a particular species or population.
- Tell students they will present their research (including the use of technology) as a painting, collage, animation, website, PowerPoint, photo essay, etc.
- Direct students to the resources in the Background Information section. Tell students their research / presentation should answer three of the following questions:
 - » How do we know what we know? What methods are being used to collect data on the organism?
 - » How has technology been used in the research of this organism?
 - » Is there an answer to the question? If not, how would you go about answering it?
 - » What kind of research still needs to be done? Are there new forms of technology being developed to study this?

- » What are conservation issues around this organism?
- » How are local Indigenous people involved? How are they affected?
- As a class, brainstorm criteria that students could use to peer assess their classmates' visual presentation (depth of research, creativity / visual design of presentation, three of the questions were answered, etc.)

Assess

- Have students complete a self-assessment of their participation in the question development activity.
- Have students peer-assess the presentations based on the following:
 - » Does the presentation answer three of the questions posed?
 - » Does the presentation show originality and creativity? In what ways?
 - » Do the images and graphics relate to the topic and enhance the presentation? Are there any unnecessary images that detract from the presentation?

Go Beyond

The Marine Planning Partnership for the North Pacific Coast (MaPP) Seasketch application offers a further opportunity to explore technology used in biodiversity research and management planning, through students exploring various data layers:

Marine Planning Partnership for the North Pacific Coast (MaPP) Seasketch application

<https://www.seasketch.org/#projecthomepage/50e58ab28aba4075183f8fc0>

- Have students explore the site and check out the layers for birds, mammals, plants, etc.
- Demonstrate how to overlay human-use polygons on top of the various wildlife polygons (for example, select the “Pacific Salmon Migration Routes” layer, and add the “Finfish Aquaculture Tenures layer”).
- Ask students to determine what kind of human impacts can be ascertained from this information. How can these maps be used for ecosystem management planning?
- Have students report back to the class (as individuals or in small groups). Ask them to create some kind of visual aid to go with a short oral presentation (notes and visual aid to be turned in for assessment). If students are reporting as small groups, include a brief peer-assessment that can be submitted as part of the students’ assessment.



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