Biodiversity Research
Scavenger hunt

BEATY
BIODIVERSITY MUSEUM

The museum contains a wealth of information on past and recent biodiversity research stories. Like a library of life, it is also a treasure trove of information for scientists to study and use for their research.

Explore the museum collections and theatre; look for biodiversity research stories about taxonomy, evolution, human uses, ecology, conservation, and more. Highlight two researchers' work below. Infer the details from information found in the museum.

Researcher:
Organism(s) studied:
Research question(s):

Look for research stories by keeping an eye out for researcher photos in the bottom left hand corner of the exhibits. These will be found in the vertical shadowboxes (Herbarium, Entomology, and Fossils) and exhibit drawers (large central areas, Marine Invertebrates, Tetrapods, Herbarium).

Hypothesis:

Conclusion and relevance:

What do you find fascinating about this research?

Researcher:
Organism(s) studied:
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What do you find fascinating about this research?

Your Project:

Find a particular collection, taxon, or organism that interests you within the museum. Examine the exhibits and find as much information as you can. Sketch or describe the organism(s) below; include classification information and scientific names.

Students can focus on a variety of topics, like ecosystems, conservation, relationships among organisms, etc. There are many fascinating specimens - you just need to look!

Take some time to observe the specimen(s) and think about their life history. Are there patterns that you find interesting? Do you have a question about it's ecology, evolution, conservation, genetics, taxonomy, or something else?
Write a research question based on your observations and thoughts below.

Some examples are: Are fish that change colour, like the seahorse, more abundant in warmer waters or cooler waters? or How vulnerable are micro-ecosystems, like moss and bromeliads, to human disturbance and patchiness?

From what you've seen at the museum and through other scientists' research, come up with a hypothesis (prediction) for your question. Include a reference if you have one.

Encourage students to put reasoning into their hypothesis. For example: I think that colour changing fish are more abundant in warm waters because there is a higher diversity of coloured substrates and potential predators.

How will you test your hypothesis? What type of data do you need to collect? How much data will you need? How long will your study run for? What type of resources do you need? Brainstorm below on how you will conduct and analyze your research.

For this example, students will have to choose what "abundance" means. Do they want to know the number of genera, species, or individuals? Is this across the globe or in sample sites? How will they ensure accuracy of information and data collection?

Their initial studies will likely start by looking at fish databases online for scientific records. Then, they might choose to do some random sampling from Alaska down to the equator. Measuring water temperature will be essential to this study.

This question is designed to be open ended, getting students to think about the multi-faceted nature of research. Where will they get funding from? How long will it take them? How will they compile the data?

How could you use the museum collections to help you answer this question?

The museum houses holdings and collections from around the world. Using these records, you could see historical fish data. You might also choose to talk to the fish curator about your question and who is currently doing research. The database from the collection is also extensive and will help this study.

Answers will depend on the question they asked initially. Encourage them to be creative. Don't forget, each cabinet is filled with specimens and is curated by knowledgeable people. Both can be a huge resource.

How will your research impact our knowledge of biodiversity? What future implications could your research project have? Think of species at risk, conservation, climate change, genetics, and more. How could other researchers take your findings and use them to their advantage? *Why is your study relevant?*

This example would help us know and better predict where colour changing traits could develop in the oceans. It may be translatable to invertebrates (like cephalopods) too. It could help conservationists decide how best to reestablish destroyed areas, keeping these types of organisms in mind.

Students should be able to answer "why does it matter?" in their answer.