EcoDetectives: Peril River

<https://www.biomanbio.com/HTML5GamesandLabs/EcoGames/ecodetectiveshtml5page.html>

**Problem:**

**Select the Species Diversity and Abundance tab first and answer the following questions:**

1. What does ***diversity*** mean, in your own words? Give an example.
2. What does ***abundance*** mean in your own words? Give and example.

**Select the Water Quality Issues tab second and answer the following:**

1. In the river water, there is both algae and bacteria when you look at it under a microscope (microorganisms or microbes).
2. What is algae?
3. What is bacteria?
4. Why are they **both** important to the river ecosystem? (what positive impact do they have)
5. How do you calculate the **average dissolved oxygen** in each table (some math!!)? Explain / show how you arrived at your answer.
6. Explain the balance of life in the river. How does the number of algae & bacteria affect the amount of fish & insects that can live in that same ecosystem?

**Investigate:**

A **hypothesis is an educated guess** about what you think happened or will happen.

1. What are the three hypotheses that might possibly explain what is happening on the Peril River?
2. Which of the three hypotheses do you think is the best explanation? Explain why you think this:

**Click on Hypothesis 1, and answer the following questions**:

1. Why would ***extra nitrates*** be a problem in this ecosystem (2 reasons)?

Click **yes** to investigate further.

1. What is the process you will use to find out if and where extra nitrates might be entering the river. Explain in steps:
2. Make a graph (using real graph paper! More math!!) that replicates the graph of the data you collected from different sites on the river. Make sure to include a title, labels on the sides (axes) and numbers with units! (**Attach the graph to this booklet before handing it in!)**
3. Where on the map does it look like extra nitrates might be coming from?

**Click Test Other Hypotheses**, then **Click on Hypothesis 2, and keep on answering questions**:

1. How do ***acids / acid pollution*** affect the river ecosystem? Why might this be a problem?

Click **yes** to investigate further.

1. What is the process you will use to find out if and where acid pollution might be entering the river. Explain in steps:
2. Without making the graph for this data, explain what you think the graph would look like.
3. Does seem like acid pollution might be causing problems in this ecosystem? Explain how you know.

**Click Test Other Hypotheses** – **click on Hypothesis 3** now, and keep answering questions!

1. How do ***pesticides*** affect the river ecosystem? Why might this be a problem?

Click **yes** to investigate further.

1. What is the process you will use to find out if and where pesticides might be entering the river. Explain in steps:
2. Make a graph (another one, using real graph paper! All the math!!!) that replicates the graph of the data you collected from different sites on the river. Make sure to include a title, labels on the sides (axes) and numbers with units! **(Attach this one to the booklet too once complete)**
3. Where does it look like pesticides in the river might be coming from?
4. What is **DDT**? (research this using google, and give a brief description)
5. Why is there more DDT in a crab compared to an insect? Explain.
6. ***Bioaccumulation*** is what causes the “Pelican Problem”. Explain the Pelican problem in your own words:

**Restoration**

Click **Home,** and then select the **Restoration!** tab.

1. Which solution do you think would **not be** **effective**? Explain why.
2. Which solution(s) did you select to solve the Peril River problems? Explain why you chose each.
3. After selecting your choice(s) of solution, would you say you were successful at restoring the **biodiversity of the ocean and abundance of species** in the river? Explain why you think this, with specific evidence to support your opinion.
4. After selecting your choice(s) of solution, would you say you were successful at restoring the **water quality** of the river? Explain why you think this, with specific evidence to support your opinion.

**Send your results to me!**

Enter your name, and then enter MY EMAIL **(**[**scomte@isd21.mb.ca**](mailto:scomte@isd21.mb.ca)) in the correct boxes. In case this doesn’t work, please screenshot the score page so you can send it to me at a later date. For **class period / hour**, please enter 78A (Comte) or 78B (Conway).

**Hand in your completed worksheet**, or email me a scanned copy of it.

Thank you!