Background Research

Overview

This lesson will walk students through the process of conducting background research. Student groups will follow the provided guidelines to generate research questions around a Great Lakes issue.

This document contains activities from lesson 4 of the Groundswell Creating Meaningful Outdoor Experiences Curriculum Unit. See the complete version of the lesson on pages 26-30 of the unit.

Curriculum Connections

Michigan K-12 Science Standards
- MS-LS2-2, MS-LS2-4, MS-LS2-5, HS-LS2-6, HS-LS4-5, 5-ESS3-1, MS-ESS3-4

Michigan K-12 Social Studies Standards
- 6 – G5.1.1, 6 – G5.1.3

Key Questions

- How do you generate research questions about an issue?
- What constitutes a high-quality, relevant research question?
- What do we need to learn about the issue we've chosen to understand it more fully?

Student Objectives

- Students will follow guidelines to generate a list of relevant research questions for their chosen Great Lakes issue.
- Students will conduct background research with various sources to better understand their chosen Great Lakes issue.
- Students will present their findings to an authentic audience.

Materials List and Setup

- Student journal or paper for written reflection
- Generating Research Questions handout
- Student technology with the Internet to research
- Materials for students to share their findings (posters, slideshow, etc.)

Lesson Activities

1. Engage:
   a. Materials:
      i. Student journal or paper for written reflection
      ii. Generating Research Questions handout
   b. Procedure:
      i. Introduce the task for the day. We have chosen _____ as the Great Lakes issue our class will address. Today, your task is to research this topic.
      ii. Prompt students to write a reflection to pull out their prior conceptions of the topic before researching. What do you already know or think you know about the topic?
      iii. Distribute the Generating Research Questions handout and guide students through the instructions.
      iv. Have students work in small groups to generate at least eight (8) research questions.
      v. When they are done, have them check with you to ensure their questions are relevant.
2. Explore:
   a. Materials:
      i. Student technology with Internet to conduct research
      ii. See the Appendix for a list of helpful website links related to each Great Lakes Restoration Initiative Area of Concern
   b. Procedure:
      i. Students will need to do online research to answer questions they generated around the class issue. Prompt them to explore at least four (4) different resources

(websites or print materials you may have available) to gather information.

    ii. If you'd like, have students record the source(s) they used to answer each question.

    iii. Generally, websites that end in gov, edu, and org will be of higher quality than those that end in com or net. You can have students peruse the websites listed in the lesson plan's Appendix section to ensure they access accurate and appropriate information.

3. Explain:
   a. Materials:
      i. Student-generated list of research questions
      ii. Materials for students to share their findings (posters, slideshow, etc.)
   b. Procedure:
      i. As students research, they will answer the minimum of eight (8) questions generated during the engage phase.
      ii. Have student groups share their findings so the whole class fully understands the issue. You may choose to bring in the principal or other school staff as an audience for student presentations, or students could create posters of their questions/answers to display in the school's hallways to inform other students.
4. Elaborate/Extend:
   b. Procedure:
      i. Depending on the capacity of your community partner to assist your class, you may encourage students to direct any remaining questions they were unable to answer to your community partner (via email, phone call, or in person).

Appendix

Cleaning up Great Lakes Areas of Concern
- https://www.glri.us/sites/default/files/glri-action-plan-2.pdf
- http://www.regions.noaa.gov/great-lakes/index.php/great_lakes-restoration-initiative/toxics/
- https://www.epa.gov/great-lakes-aocs/restoring-great-lakes-areas-concern
- https://www.epa.gov/great-lakes-aocs
- https://www.epa.gov/greatlakes/contaminated-sediment-great-lakes
- https://www.cbc.ca/news/canada/5-chemical-threats-to-the-great-lakes-1.1055139

Preventing and controlling invasive species
- https://www.invasivespeciesinfo.gov/whatis.shtml
- https://www.glri.us/sites/default/files/glri-action-plan-2.pdf
- https://www.epa.gov/greatlakes/invasive-species-great-lakes-0
- http://www.regions.noaa.gov/great-lakes/index.php/great_lakes-restoration-initiative/invasive-species/
- https://greatlakes.org/campaigns/keeping-invasive-species-out/
- http://www.glfc.org/invasive-species.php
- http://www.iiseagrant.org/NabInvader/great_lakes.html
- https://www.nwf.org/Our-Work/Waters/Great-Waters-Restoration/Great-Lakes

Reducing nutrient runoff that contributes to harmful/nuisance algal blooms
- https://www.glri.us/sites/default/files/glri-action-plan-2.pdf
- https://oceanservice.noaa.gov/hazards/hab/
- http://www.noaa.gov/what-is-harmful-algal-bloom
- https://www.epa.gov/nutrientpollution/harmful-algal-blooms
- https://www.cdc.gov/habs/index.html
- https://oceanservice.noaa.gov/facts/nutpollution.html
- https://www.epa.gov/nutrientpollution/problem
- https://www.epa.gov/nutrientpollution/sources-and-solutions

Restoring habitat to protect native species
- https://www.glri.us/sites/default/files/glri-action-plan-2.pdf
- https://www.epa.gov/wetlands/why-are-wetlands-important
- https://www.fisheries.noaa.gov/coastal-wetlands-too-valuable-lose
- https://www.biologicaldiversity.org/campaigns/protecting_native_plants/

- https://www.worldwildlife.org/habitats/wetlands
- https://www.fisheries.noaa.gov/national/habitat-conservation/great-lakes-habitat-restoration
- https://www.audubon.org/content/why-native-plants-matter
- https://www.glc.org/work/habitat
- http://www.miseagrant.umich.edu/lessons/lessons/by-broad-concept/life-science/habitat-restoration/

Generating Research Questions

Background research is important for helping you understand the Great Lakes issue you've identified and gather ideas to design a stewardship project.

<u>Directions:</u>
You can follow the steps below to generate a list of important questions you need to answer through online research.

1. Identify the keywords in the topic. Brainstorm additional keywords and concepts you might need to search. Use the Great Lakes Issue statement as a place to start identifying keywords. Here is an example of an Atlantic Ocean concern:
   a. **Issue:** Plastic pollution is harming wildlife that lives in the Atlantic Ocean

   In this example, the keywords would be:
   - Plastic
   - Pollution
   - Wildlife
   - Atlantic Ocean

2. Use the following question stems and the keywords you came up with to create research questions. The goal is to use the question stems (why, how, who, what, when, where) with your keywords. Ask why, how, and what causes things to happen, etc.
   a. **Question Stems:**
      i. What
      ii. When
      iii. Where
      iv. How
      v. Does
      vi. Why
      vii. Which
   b. **Research Question Examples:**
      i. Which species are harmed by plastic pollution?
      ii. When did plastic pollution start becoming such a problem in the Atlantic Ocean?
      iii. What are people doing to solve the issue of plastic pollution?

3. Throw out irrelevant questions. You can always find more information to research, but some questions have nothing to do with the issue and stewardship project you will create.
   a. Relevant Questions = questions that **will** help you gather information on your Great Lakes issue and understand how to solve it.
   b. Irrelevant Questions = questions that **will not** help you gather information on your Great Lakes issue and understand how to solve it.