



“Toxic Waters – Lessons Learned From the Bald Eagle”

Discovering Our Watershed Elective

Saginaw Bay Visitor Center

School Program Description

Bay City State Recreation Area

Level: 4th, 5th or 6th Grade

PROGRAM DESCRIPTION:

This program focuses on the importance water quality plays in every living creature’s existence, the factors which indicate good water quality and how man is part of the water pollution problem and solution. The program opens with a groundwater model demonstration on how man’s use of the land introduces pollutants that are carried to our rivers and lakes by way of the water cycle, and identifies the major pollutants present in the Saginaw Bay. Students are introduced to the most common Saginaw Bay fish through a hands-on fish classification lab where they identify Saginaw Bay Fish by their traits and characteristics. Students will also explore the freshwater coastal ecosystem on a hike out to the Saginaw Bay, surveying the wetland community, its living and non-living components, man’s use of the land and the Saginaw Bay. The trip concludes with a tour of the visitor center museum, which includes participation in a computer touch screen virtual fishing scenario where ultimately the student must catch, measure, and ID a fish then use the Michigan Fish Consumption Advisory to determine whether they will eat it or not.

PROGRAM GOALS:

Each student will see the connection between water quality of the Bay and the health of the food web within its ecosystem, and have a better understanding how man is a part of the water pollution problem and solution.

PROGRAM OBJECTIVES:

1. Each student will be able to list water as one of the four things every living creature needs to survive.
2. Each student will be able to list at least three pollutants which effect water quality and how they are introduced into the Saginaw Bay’s ecosystem.
3. Each student will be able to describe sediment as a pollutant which decreases water quality.
4. Each student will be able to give an example of one way man’s use of the land could affect water quality.
5. Students will be able to describe how wetlands help keep our water clean.
6. Students will be able to identify several components of an eagle’s food web.
7. Students will be able to describe the physical characteristics of the bald eagle and two other birds of prey and of three fish that help them survive in their environment.
8. Students will be able to describe a behavioral characteristic of the bald eagle, and three fish that help them survive in their environment

9. Students will be able to identify factors in the Great Lakes aquatic ecosystem that influence changes in fish and bird populations.
10. Each student will be able to classify what family a fish belongs to using the fish's unique traits and anatomical features.
11. Students will be able to describe different members of a Great Lake food chain/food web and their place in it.
12. Students will be able to identify the gills of fish as a part of the respiratory and circulatory systems, the tongue and its function in the digestive system, the anal opening as part of the excretory and reproductive systems, and the lateral line and nares as part of the nervous system
13. Students will be able to determine what the fish advisory for a particular fish is by using a measuring stick and the MDCH Fish Consumption Advisory Guide.

PRE-VISIT SUGGESTIONS:

1. Call the visitor center to make you pre-visit classroom program scheduled for part one of you Lessons Learned from the Bald Eagle.
2. Be sure that every student is dressed for the weather conditions. Layers work best. Our weather can be 10 to 15 degrees cooler near the Bay than at your school site. Tell them to wear shoes which can get muddy. If it is winter and we have snow, students will have the opportunity to use snow shoes so boots must be worn.
3. Review Vocabulary: water, wetland, conservation, macro invertebrate, environment, sediment, turbidity, photosynthesis, oxygen, carbon dioxide, nutrients, pH, pollutant, herbicide, pesticide, bio-accumulation, toxin, precipitation, run-off, condensation, evaporation, predator, prey, abiotic, biotic, parasite, competition.

POST-VISIT SUGESTIONS:

1. Make a chart or table depicting the data collected by each group on their ecosystem survey hike. Graph the data collected.
2. Keep a class scrapbook on newspaper articles regarding the Dioxin issue and other incidents which affect the water quality of the Saginaw Bay.
3. 5th grade classes can follow up this program by participating in 5th Grade Fishing for Fun.
4. Teachers attend Project WET or Project WILD workshop and get two books bulging with fun interdisciplinary, cross-referenced, hands-on lesson plans for water studies.
5. Conduct the Project Wild Lesson: "What's in the Water?"
6. Have the students design their own fish, name it and describe its food, water, shelter and space requirements (or Project Wild lesson: Fashion a Fish).
7. Visit a DNR Fish Hatchery.
8. Participate in the all new DNR classroom program "Salmon in the Classroom"
9. Participate as a class in the BAY SAIL program. Information on BAY SAIL is available from the Bay Area Visitors and Convention Bureau.
10. Obtain a list of land use precautions that the EPA has identified for people living or using land that has been contaminated by the dioxin in our area.
11. Have the students highlight on a county map or state map the floodplain areas contaminated with the dioxins.

12. Call the Saginaw U.S. EPA office and see if a field agent is available to make a visit to your classroom or if they can make supplementary classroom materials available to your students. Mary Breeden, EPA, 111 S. Michigan LL015, Saginaw, MI 48602 (989) 790-5215
13. Contact Saginaw or Bay County Health Department and ask for information on other environmental health programs which are available for your students.

COORDINATING WITH MICHIGAN SCIENCE Grand Level Content Expectations:

Science. Inquiry Process: S.IP.04.11, S.IP.04.12, S.IP.04.13, S.IP.04.14, S.IP.04.15, S.IP.04.16, S.IP.05.11, S.IP.05.12, S.IP.05.13, S.IP.05.14, S.IP.05.15, S.IP.05.16, S.IP.06.11, S.IP.06.12, S.IP.06.13, S.IP.06.14, S.IP.06.15, S.IP.06.16,

Science. Inquiry Analysis & Communication: S.IA.04.11, S.IA.04.12, S.IA.04.13, S.IA.04.14, S.IA.04.15, S.IA.05.11, S.IA.05.12, S.IA.05.13, S.IA.05.14, S.IA.05.15, S.IP.06.11, S.IP.06.12, S.IA.06.13,

Science. Reflection & Social Implications: S.RS.04.11, S.RS.04.14, S.RS.04.15, S.RS.04.16, S.RS.04.17, S.RS.04.18, S.RS.04.19, S.RS.05.11, S.RS.05.12, S.RS.05.13, S.RS.05.15, S.RS.05.16, S.RS.05.17, S.RS.05.19, S.RS.06.14, S.RS.06.15, S.RS.06.16, S.RS.06.17, S.RS.06.19

Physical Science. Properties of Matter: P.PM.04.23

Physical Science. Changes in Matter: P.CM04.11

Life Science. Organization of Living Things: L.OL.04.15, L.OL.04.16, L.OL.05.41, L.OL.05.42, L.OL.06.51, L.OL.06.52

Life Science. Heredity: L.HE.0511

Life Science. Evolution: L.EV.04.21, L.EV.04.22, L.EV.05.11, L.EV.05.12, L.EV.05.14, L.EV.05.21

Life Science. Ecosystems: L.EC.04.11, L.EC.04.21, L.EC.06.11, L.EC.06.21, L.EC.06.22, L.EC.06.23, L.EC.06.31, L.EC.06.32, L.EC.06.41

Earth Science. Earth in Space & Time: E.ST.04.12, E.ST.05.25

Earth Science. Solid Earth: E.SE.06.11, E.SE.06.12, E.SE.06.13

COORDINATING WITH M.E.A.P. SOCIAL STUDIES CONTENT STANDARD

BENCHMARKS: *(underway GLCE's correlation)*

Geographic Perspective

II.1—I.e.2

II.2—I.e.1, I.e.2, I.e.3, I.e.4

II.4—I.e.5

II.5—I.e.1

Civic Perspective

III.3—I.e.2

II.4—I.e.2

Public Discourse and Decision Making

VI.1—I.e.1, I.e.3