

Strand III: **Using Scientific Knowledge in Life Science**

Standard 5: **Ecosystems – All students will analyze how humans and the environment interact**

Benchmark 6: **Describe ways in which humans alter the environment.**

Constructing and Reflecting:
SCI.I.1.1 - _ Generate scientific questions about the world based on observation.
SCI.I.1.5 - Use sources of information in support of scientific investigations
SCI.II.1.4 - Describe the advantages and risks of new technologies.
SCI.II.1.5 - _ Develop an awareness of and sensitivity to the natural world.

<p>Vocabulary / Key Concept</p> <ul style="list-style-type: none"> • agriculture • land use • renewable and nonrenewable resource development • resource use • solid waste • toxic waste • biodiversity <p>See <u>V.1.MS.5</u> (Explain how technology changes the surface of the earth.) See <u>V.2.MS.3</u> (Explain how water exists below the earth’s surface and how it is replenished.) See <u>V.3.MS.4</u> (Describe health effects of polluted air.)</p>	<p>Context</p> <p>Human activities, such as:</p> <ul style="list-style-type: none"> • farming • pollution from manufacturing and other sources • hunting • habitat destruction • land development • reforestation • species reintroduction
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Knowledge and Skills

Students will evaluate the positive and negative effects of human activities on the environment. Society's actual needs and perceived needs shape decisions about how humans use the environment.

Human activities that change the surface of the Earth:

- surface mining, construction, farming, dams, landfills, restoring natural resources, and land management

Sources of pollution in the hydrosphere:

- sewage, industrial waste, agricultural runoff, and household dumping

Sources of pollution in the atmosphere:

- acid rain, car exhaust, and industrial emissions

Health effects of polluted air:

- irritated eyes and breathing difficulties

Resources

Coloma Resources:

Environmental Science Prentice Hall,
Chapters 4, 5 & 6
Project "Wet" Reference Book

Other Resources:

- *The Great Lakes Story* – Brett Merritt: MSTA Journal
- Grand Valley State University – *Research Vessels*
- Bill Nye: Caves, Deserts, Forests, Lakes, Ponds, Ocean Life, Rivers, Streams, Wet Lands.
- Science Explosion: Ecosystems
- Scope Unit – [Dynamics of an Ecosystem](#)
- [Invasive Species](#) - Interactive Lessons
- [BCISD Classroom Resources](#) – Ecosystems

Videoconferences Available

For more information, see www.remc11.k12.mi.us/dl or call Janine Lim 471-7725x101 or email jjlim@remc11.k12.mi.us

III.5.MS.6

Diving into Solution to Pollution from the Aquatic Research Interactive, Inc.

Diving into Toxic Release Inventory from the Aquatic Research Interactive, Inc.

Bountiful Biodiversity from the Camden Children's Garden

Celebrating Agriculture and the Good Earth from the Center for Agricultural Science and Heritage, Inc.

6th Grade Science Curriculum

Technology Resources

III.5.MS.6 Describe ways in which humans alter the environment.

Vernier Probes available: Temperature Probe, pH Sensor

REMC Materials: Decisions Decisions: The Environment, Order #060112

Radiant Rainforests from the Cincinnati Zoo and Botanical Garden

Earthwalks from the Lake County Solid Waste Management District

Talkin' Trash from the Lake County Solid Waste Management District

The Story of Chocolate from the Milwaukee Public Museum

Corn is Life - The Hopi Perspective from the Red Vista Ranch LLC

Instruction

Focus Question: What positive and negative effects do humans have on the environment?

The class will brainstorm and identify non-native organisms that have been introduced to the Great Lakes since the St. Lawrence Seaway opened. If necessary, students should be directed to the following:

- sea lamprey
- alewife
- zebra mussel

Using periodicals, newspapers and the Internet, students will research the following questions about a non-native species introduced into the Great Lakes:

1. How was the organism introduced?
2. What niche did the organism fill and which organism(s) was displaced?
3. What are the stages in the organism's life cycle?
4. What positive effects might this organism have on the ecosystem?
5. What negative effects might this organism have on the ecosystem?
6. How have humans tried to restore the natural balance?

The students will present their findings in a debate of the positive/negative effects of the introduction of the (intentional or accidental) non-native species into the Great Lakes.

Assessment

Optional Assessment:

If possible, read In the Next Three Seconds by Morgan (ISBN 0140566244). This book takes a look at common human activities and their impacts on our world.

Students read the following statement:

"In the next three seconds, 93 trees will be cut down to make the liners for disposable diapers."

Students will brainstorm ways that the use of disposable diapers have impacted our world.

Next, present the following scenario to the student:

In light of this statement, a new law has been proposed in Lansing that banning the use of disposable diapers.

Students will receive a card from the teacher, indicating a role of a community member they will take, such as:

- Aileen, Diaper Manufacturer
- Samantha, K-Mart Manager
- Juan, Peter Pan Nursery School Director
- Hitoshi, Hospital Nurse
- Sam, Sam's Septic Service
- Maria and Jose, Parents of Newborn Triplets
- Jamal, Green Peace
- Bonnie, XYZ Waste Disposal
- Dee Dee's Diaper Delivery Service

Students must prepare a 2-minute speech reflecting the character's point of view either supporting / opposing this law. Students will present their speeches to the legislative body in Lansing / a social studies class.

Scoring Rubric:

Criteria: Accuracy of reasons

Apprentice - Presents one supportive argument for position.

Basic - Presents two supportive arguments for position.

Meets - Presents three supportive arguments for position.

Exceeds - Presents four or more supportive arguments for position.

Assessment (Continued)

Criteria: Quality of speech

Apprentice - Delivers a speech with inaccurate or incomplete thoughts.

Basic - Delivers a speech that provides information but is difficult to follow at times.

Meets - Delivers a speech in an effective, engaging manner.

Exceeds - Delivers a thorough, well-supported argument that entertains the audience.

Criteria: Accuracy of visual aid(s)

Apprentice - Incorporates a visual product that inaccurately displays some aspect of the position.

Basic - Incorporates a visual product that ineffectively displays some aspect of the position.

Meets - Incorporates a visual product that effectively displays some aspect of the position.

Exceeds - Incorporates multiple visual products that display several aspects of the position.

Teacher Notes: