

Reading the River, Summer 2002

“Space Invaders”

8th Grade Science

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# “Space Invaders”

## Students will be able to:

- Learn the difference between local native and exotic plants.
- List both human-made and natural causes of barren shoreline on the Licking River
- List long term and future effects of exotic growth intrusion on a local, regional and national level.
- Describe what is being done to counteract exotic intrusion on a local, state and national level.
- Be aware of what THEY can do both now and on a continuing basis to ensure the health of the ecosystem(s)

## Program of Studies

### Students will:

- Have a hands-on demonstration of the Scientific Method
- Witness the effect of exotics on their environment
- Learn how the river is controlled by nature and technology

## Conceptual Understandings

### Students will:

- Learn the variations in growth rate and dominance of native and exotic flora.
- Witness (via field trip) soil erosion of the Licking River and its' adverse effect on the overall stability of the ecosystem. Project long-term effect of uncontrolled erosion.

## Core Content

- Nature and humans are both responsible for the erosion and subsequent introduction of exotic species of flora and fauna.
- Although all exotics are not harmful to the overall health of the ecosystem (Kentucky Bluegrass for example), we must be made aware of the potential adverse effects of non-native organisms to the environment and health of the banks of the Licking River.

- What we can do on an individual level to reclaim the banks of the river.

### Materials

- Three sturdy wooden boxes approximately 14"x14"x4".
- Enough soil (gathered on our field trip to the Banks of the Licking River) to fill all three boxes approximately 1" from the top of the box.
- Several seeds of different types of native and exotic plants.
- Four liters of distilled water.

### Activity Procedure

- Fill all three boxes with equal amounts of soil.
- Position each box (indoors) so that each is exposed to equal amounts of sunlight.
- Label the first two boxes "Native", the third "exotics"
- In the first two boxes, plant seeds that are native to our area.
- Cover the third box with wax paper.
- Water the first two boxes with equal amounts of water at the same time each day.

After all of the plants in the first two boxes have matured, plant several non-native seeds in the third box. At the same time, plant several non-native seeds in the first box. Continue the daily watering schedule, making sure that the only variable is the introduction of the non-native plants to the first box. Monitor and record the growth rate of the non-natives in the first box compared with the growth rate of the non-natives in the third box. Also, monitor and record the growth rate of the natives in the first box as opposed to the third box. Draw your conclusion.

### Accompanying handouts/materials

Each student will be given a guide of plants that are native to our area as well as those which are not. Handouts are "A Field Guide to Kentucky Lakes and Wetlands", available from the Water Watch Kentucky Division of Water.

### Definition/Explanation of concept/skill:

Using the Scientific Method, students will be able to observe, record and report the germination rate, survival and interaction of native & non-native

plants. In addition, students will have been a hands-on demonstration of the need for reclamation of the riverbank(s) locally, regionally, nationally & globally.

Method to assess stated objective(s)

Each student will keep a logbook in which his or her observations are made. The logbook entries will be done weekly. Upon completion, the logbooks will be graded as to the students' adherence to the Scientific Method, Data validity, logical conclusions and cohesiveness.

## Grading Rubric

Level 4      Excellent, thoughtful, demonstrates understanding of project

- Logbook uses proper form and style
- Adherence to Scientific Method apparent
- Demonstrates in-depth understanding of concept and processes
- Interprets data correctly and draws appropriate conclusion
- All work shown, mastery exhibited

Level 3      Above average, most important components of the project covered.

- Above average, strong presentation but lacks depth and understanding of an excellent presentation
- Logbook complete and clearly communicated
- Major concepts understood but less important concepts/conclusions overlooked.
- Adherence to Scientific Method apparent
- Important components of project understood and communicated clearly

Level 2      Average, meets minimum requirements, lacks understanding of some concepts

- Exhibits limited conceptual understanding
- Important components of the project omitted
- Conclusion communicated incorrectly or incompletely

Level 1      Below average, little understanding of project demonstrated

- Demonstrates minimal understanding of the question
- Question addressed incompletely or incorrectly

## References:

- Licking River Valley Resource Conservation and Development Council, Inc. “What are the water quality problems in the Licking River?” downloaded from WWW.
- LRVRC&D “Land in the Licking River Region”, downloaded from WWW.
- United States Environmental Protection Agency “Landscaping with native plants”, “What is a native plant?” “What is a non-native plant?” “Why should I use native plants” and “Seeding vs. Transplants”, downloaded from WWW.
- Kentucky Division of Water, “A Field Guide to Kentucky Lakes and Wetlands”, Kentucky Natural Resources and Environmental Protection Cabinet, May 1985 (Revised May 1986).
- Professional Paddlesports Association, “Expedition – Based Education”.