Humpty Dumpty
Maymont Post-Visit Activity

**Purpose:** Students will understand the challenges of restoring an altered natural environment and appreciate the importance of conservation.

“The last word in ignorance is the man who says of an animal or plant, "What good is it?" If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.”
— Aldo Leopold, *Round River: From the Journals of Aldo Leopold*

**Science Background:**
Natural systems are inherently complex because they are comprised of many interrelated pieces working together (i.e. plant and animal populations, and non-living features such as soil and water). Because of this, biological systems, watersheds, and habitats (particularly wetlands) are difficult to restore once damaged. If parts are lost, left out, or not put back in the proper relationship with the other pieces, the ecosystem will not work the way that it used to function. Natural systems can be altered by both natural events and human activities. Human activity can lead to contamination of ground water, erosion, loss of wildlife species, saltwater intrusion, etc.

Restoration projects are undertaken in the hopes of returning ecological systems to their natural states. However, since changes to the system may have taken place many years ago, parts may be missing or knowledge of what the site originally looked like may be lost, making it difficult to restore it. The quote from Aldo Leopold above describes the importance of proactively preserving all the pieces of a natural system because each has an important role without which the system could fail. Even the best restoration projects may not restore the habitat to its original, pristine state.

**Materials:**
- Photos of altered sites
- A hard-boiled egg
- Small flower pots
- Paper plates
- Thick paper or cloth bags
- Safety goggles
- Glue
- **Optional:** Object with multiple parts that could be disassembled (e.g. an old clock)

**Procedure:**
1. Begin by reviewing wetland habitats and their ecological roles (i.e. nurseries for young animals and insects, large food sources, migration pit-stops, filter out pollution and retain it in soil, store large amounts of carbon to reduce amount in atmosphere, etc.). Brainstorm the many pieces that function together to make up the wetland—what kinds of living things and non-living things can be found there? How do they relate to one another?
2. Show the students a hard-boiled egg and recall the nursery rhyme “Humpty Dumpty.” Drop the egg onto a table so that all can see. Pass the egg around so that students can see how it has changed.
Can Humpty Dumpty be put back together again? Why or why not? (Many pieces are broken, some might be missing, etc.)

3. Show the students the photos of altered habitats (preferably wetland habitats). What changes have occurred here? Are they natural or man-made impacts? How can the habitats be improved?

4. Introduce restoration. Talk about the purpose of restoration and emphasize the complexity of restoration efforts. Read the Aldo Leopold quote above (paraphrase for younger students). How does this quote relate to restoration?

5. Divide the class into small groups and give one clay pot to each group. Have the groups decorate the clay pots to represent wetland habitats. Tell them that the primary job of their “wetland” is to support life. Warn the students that their “wetlands” will be heavily altered (broken)!

6. When the students have finished decorating the pots, have the students place their pot in a bag and trade pots with another group. Make sure every group has a different clay pot.

7. (Optional) Have the groups decide what kind of impact will disrupt their habitat: hurricane, construction, earthquake, pollution, etc.

8. Choose one person from each group to be the natural or man-made impact on the wetland habitat. This person will drop the bag on the ground to simulate the degradation of the natural system as a result of the habitat impact. Be sure to go over safety requirements and have the selected students wear safety goggles. Also be sure that the students do not smash the pot into unworkable pieces: the pieces should be large enough to put back together, but not too large that it is too easy! Having the groups do this one at a time ensures there are supervisory eyes on each demolition and increases the suspense of the activity.

9. Once the pots are broken, instruct the students to gently pour the pieces out of the bags and onto their plates. Ask the students if the habitat looks any different. What do the broken pieces represent? Is the wetland still functioning as normal? How could the wetland be restored?

10. Ask the students if any of the pieces seem unimportant. Instruct the students to remove what seems like the least important piece. Collect one piece from each group.

11. Have the students carefully glue the pots back together with their groups. Be wary of sharp pieces and emphasize caution working with the clay pot shards. Pieces that are too small to glue can be thrown out.

12. After the groups are finished with their restorations, have the groups return the pots to their original owners. Each group should have the pot they originally decorated.

13. Ask the students the reflection questions below.

Reflection Questions:
These questions can be asked to the class or provided as an individual writing assignment.

- How does the wetland look after the restoration? How does it compare to the way it looked at the beginning?
- Was the restoration successful? Why or why not?
- Was the “unimportant” piece really unimportant? Why or why not?
- Was it difficult to restore the wetland?
- Can the “wetland” still serve its primary purpose? (Could the “wetland” still contain soil and a growing plant?)
- Is wetland restoration pointless? Why not?

Keep it Going: Fill the “wetlands” with potting soil and plant flowers in them. Keep them in your classroom and watch them grow!