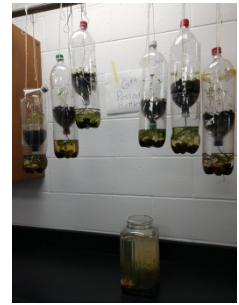


Can you model a sustainable ecosystem...in a bottle? Sure!

7th graders at Interstate 35 Middle School in Truro, Iowa are attempting just that! As part of the NGSS standards, 7th grade students are asked to: *Develop a model to describe the cycling of matter and the flow of energy among living and nonliving part of an ecosystem.* (NGSS MS-LS2-3) Next the students *analyze and interpret data to provide evidence for the effects of resource availability on organisms and population of organisms in an ecosystem.* (NGSS MS-LS2-1)



The students use two liter bottles, rocks, soil, radish seeds, aquatic plants, and pouch



snails to construct a terrestrial-aquatic contained ecosystem. After exploring how energy moves through an ecosystem and learning the categories of organisms that make up the energy pyramid, student determined what level of populations of organism could be maintained in a small closed system.

Once students had a solid grasp of the nutrient and energy flow, we explore the impact of outside forces including road salt and farm runoff. We discussed these as issues of debate, and determined, as Iowans, we could all best address the issue of nutrient management. Students still struggled with why nutrient

management is necessary to sustain their life style. Comments such as, "If farmers weren't greedy, we wouldn't need fertilizers" to "Fertilizers are like candy, the more the better."



So, some clarity was obviously needed. I turned to *Humanity Against Hunger* from the Nutrients for Life Foundation to help student understand the necessity of nutrient



management as a plant and human health issue. They were excited to see how they could learn to use observation to diagnose crop health issues and in turn help people. To follow up we used *Journey 2050* to build the understanding of the larger picture of sustainability. The students love the game and some commented, "I learned so much about farming." And "It was neat to see how people farm in other countries."

We will move forward with *using Nourishing the Planet in the 21st Century* to deepen understanding. Our cumulating experience will be planting school kitchen garden incorporation with the 3rd grade students. Nutrients for Life materials make my job easy!