Nashua River Watershed Investigations for Grades K-8

Lesson # 4-2

Lesson 4-2 Flood Protection Design

Grade Level and Standard: Grade 4
4-ESS3-2 Evaluate different solutions to reduce the impacts of a natural event such as an earthquake, a blizzard or flood on humans. (example: construct a wetland to mitigate flooding).

Objective: Students will design wetlands that will prevent flooding and then use the claim-evidence-reasoning format to explain their experiment.

Background: Wetlands are important because they serve as critical habitat for many species, but they also serve us in other ways. One of the most important functions of wetlands is how they serve as filters to trap pollution and sediment from urban runoff. Because wetlands often lie on the borders between uplands and open waterways, they act as a buffer between the two. Wetland plants slow the flow of water enough to allow the heavier particles to settle out. Smaller particles are trapped in the mesh of leaves, stems and roots of a densely vegetated wetland. The result of urban runoff traveling through a wetland is cleaner water entering the larger waterbody.

By slowing the flow of water, wetlands are also helpful in flood control. For example, when a heavy rainstorm increases runoff, the added water may cause waterways to overflow and flood adjacent land (homes, businesses, farms). Wetlands offer runoff a place to “rest” and soak into the soil, thereby reducing the potential for flooding.

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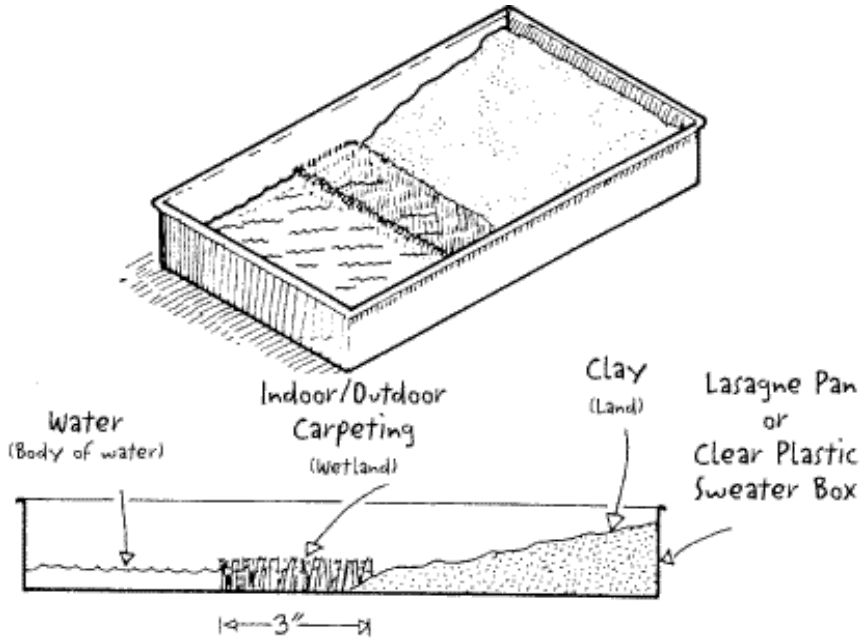
Materials:

- Modeling Clay
- Long shallow pan: a sturdy metal or glass pan with a smooth, flat bottom works
- Sponges (enough to span the width of pan) or outdoor carpeting
- Spray bottle with water
- Q-tips
- Colored drink mix
- Optional: items to represent wetland plants and animals could include pine needles, clay for animals, toothpicks and marshmallows for cattails.

Procedure:

1. Build a hill out of clay on one end of the tray.
2. Set up sponges below the hill.
3. Spray rain on hills and observe water. What happens?
4. Next remove wetlands and spray. What happens?
5. Make a claim about wetlands and flooding and support your claim with evidence from this experiment.



(http://www.epa.gov/safewater/ki.PDF)

Data Sheet: (attached) Do wetlands prevent flooding?

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DO WETLANDS PREVENT FLOODING? **4-2 Data Sheet**

Name_____

1. Spread the clay over one half of the pan and make a hill, rivers, streams.
2. Put sponges at the base of the hill but leave about ⅓ of the pan open for water.
3. Spray rain on the hills and describe how the water moved.

_____

_____

4. Now remove the wetland, spray water and describe what happened to water.

_____

_____

5. Next, replace wetland, put a pinch of "pollution" on the hill, make it rain and see explain what happened to pollutants.

_____

_____

6. Now remove wetland, put a pinch of "pollution" on the hill, make it rain and explain what happened.

_____

_____

7. Make a claim.

I think that wetlands_____

_____

8. Use evidence to support your claim.

I believe this because_____

_____

_____

My reasoning is_____

_____

_____

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