Water Cycle Simulation Activity (1st – 4th grade)

**Goal:**

To demonstrate the water cycle as well as the function of dams and irrigation canals.

**Additional goals:**

If time permits (or if you decide to make this project longer than 1-2 days), you can spend time doing the following goals:

1. The anatomy of a lake
2. The anatomy of a river (including deltas)
3. The ideal dam and its ideal position

**Duration of activity:**

A single 1.5 hour period if only the primary goal is achieved.

Two 1.5 hour periods would be required for all goals to be achieved.

**Requirements:**

1. A large area with lots of dirt/soil
2. Trowels, shovels, and hoes
3. A large water cooler
4. Large sponges
5. A water source
6. A large plastic slab (for the dam)
   1. Or any long boards of water-proof material

**Lesson Layout:**

1. **Introduction** of water and its essentiality to life **(lecture)**
2. Lead the students into **inquiry based science** by providing the question, “Where would people most likely live in the ancient world?”
   1. Be sure to provide the facts that (1) ocean water is unfit for consumption, (2) there were no pumps or trucks back then for water transport, and (3) rain water is not reliable
   2. The answer should be: “Near rivers.”
3. Provide a **model** for a river system:
   1. A mountain lake that feeds the river
   2. The river that goes downhill and flows towards the sea
   3. The delta of the river
4. Lead the students into understanding how **irrigation systems** work and why it’s important (people would have to carry it all the way otherwise)
5. Split the students into **teams**
   1. One team to build the lake
   2. One team to build the river
   3. One team to decide where the ideal location of a village would be relative to the river
      1. This team also decides the ideal location of the village’s farm and the irrigation system that goes with it (and builds it)
   4. One team decides the best place for the dam and works with the team working on the lake to place the dam in position
6. **Construct** the different parts
7. Fill the lake with water with the dam intact
   1. Water should flow over the dam and down the river
   2. The irrigation system should be fed and the farm watered
8. After the water stops flowing over the top of the dam assign two students to fetch water from the cooler with the sponges
   1. They are to sprinkle the water onto the lake to simulate rain
   2. They should realize by themselves that the river will go dry or stop flowing if there is no constant rain (they will have to make regular trips to the water cooler to keep the river ‘alive’)
9. The final demonstration will be a flood
   1. Option A: break the dam and allow the lake to empty into the river
   2. Option B: pour water straight from the cooler into the lake to overcome the dam
   3. Students should observe where the water flows (downhill)
      1. Ask questions deriving from this information: where is the safest place for people go if there is a flood? Where should a village be built in order to avoid getting flooded?
      2. Ask how people can prevent floods if they had a dam
         1. Make sure it was maintained
         2. Let more water out than usual when they know that there’s a lot of rain (this should cause a more active river but not a flood)
10. The Water Cycle
    1. Explain how the water cycle works
       1. Water evaporates from the ocean and become clouds (water cooler 🡪 sponge)
       2. Clouds travel to mountains and rain/snow (sponge sprinkling on lake)
       3. The lake fills with water and the water flows downhill toward the ocean
       4. The cycle begins again
    2. Ask how learning about he water cycle will help:
       1. Warning and prediction of floods
       2. Village/farm placement
       3. Irrigation systems
       4. Dam technology

**About the lesson:**

I just want to argue that this activity does far more for students in terms of the water cycle than sitting in a class room reading it. The students will retain the knowledge far better and have enjoyed the lesson to boot.