

Unit 4: Water & Erosion

Unit Summary: This unit focuses on the importance of water and erosion to the ag producer. It is intended to be delivered in two parts. The first (4a) discusses water and erosion in the Pacific Northwest. It discusses the water cycle, water storage, and erosion. The second half of the unit focuses on scientific computer based models and how one specific model was created.

Teaching Time: It is anticipated that this unit and its related activities will take a minimum of four 50-minute class periods to complete, and more depending on the variations selected in the lab activities. Depending on the number of readings utilized, this could be longer. Several teachers reported using this unit for two full weeks of their semester, but included additional activities related to erosion lab by modifying the soils through a variety of processes including increasing organic material in the soil, and freezing the soil and then saturating an unfrozen layer on top of the frozen layer. They also let students modify and rerun the lab according to their modifications.

Audience: 9-12 Science & Agriculture Students

Unit's placement in the overall course: This unit is designed to be delivered with the unit of soils as the subjects of soils, water and erosion general associate well with students. It is an extension of the soils foundational unit building upon the soils unit through discussion of the erosion of soils by water. Historic loss of topsoil in the Pacific Northwest exceeds 10 feet on some sites and has been a major focus of research and producers for decades. Many of the related practices also fit with the topic of cropping systems, another unit in the REACCH curriculum.

Goals: Two goals for this unit are for students to explain the integrated relationship between soils, water, and erosion. The second is for students to start to explore scientific models, but a key component of the Next Generation Science Standards, and an area future scientists need to understand earlier in educations.

Description of the unit: This unit includes two PowerPoints and two laboratory activities. Teacher notes are supplied with most slides to help guide class discussion. Multiple readings on water and erosion are included with emphasis on the role of water in the west.

Using this unit: Within the PowerPoint for this unit are hidden slides. On these slides are embedded Microsoft Word Documents. These documents provide the additional resources needed to deliver this unit. A standards document is provided which includes the relevant Next Generation Science Standards, Common Core State Standards for Math and ELA, and Agriculture, Food, & Natural Resources Standards. The standards included may be only introduced through this curriculum, and the teacher will need to decide the level at which they want to augment the provided instruction in relation to these standards. Readings associated with the unit are in a separate zipped PDF file. This document includes all the readings in one zipped file so teachers can select those readings most appropriate for their classrooms.

Related Readings for Meeting CCSS in ELA: These readings are not overly technical, however teachers reported some difficulty using them with students on IEP's. To accommodate these students it is recommended teachers choose a portion of the readings and run it through an application like <http://www.rewordify.com> which can adjust the reading levels as needed.

Required Supplies:

Soil Infiltration Lab (per group, group size of 2 recommended):

- Aluminum bread pan (inner pan)
- Sturdy bread pan slightly larger than disposable (catch pan)
- 12 oz. soda bottle with holes in the lid
- Soil sample(s)
- 400 mL beaker (or similar measuring container)
- Binder clips (2)
- Ruler

Erosion Modeling Lab

- Computers with internet access