

NGSS Unit Planning with UbD

Teacher Name: 4th grade team

Date: 9-22-16

School Site: E. Hale Curran

Unit: Earth Changes Over Time, Module 2

NGSS Covered:

- **4-ESS2-1:** The student is expected to make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- **4-ESS3-2:** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- **3-5-ETS1-2:** The student is expected to generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Cross Cutting concept: Cause and Effect

Science and Engineering Practice: Planning and carrying out investigation

CCSS ELA Covered:

W.4.7- Conduct short research projects that build knowledge through investigation of different aspects of a topic.

W.4.8- Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

CCSS Mathematics Covered:

MP.2- Reason abstractly and quantitatively.

MP.4- Model with mathematics.

MP.5 Use appropriate tools strategically.

4.MD.A.1- Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz;l, mL; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

4.MD.A.2- Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Note: This module should take about 7 to 10 days

Understanding by Design NGSS Unit Plan	
Stage 1: Desired Results	
Understand Students will understand that earth processes aid in the shaping of earth over time.	Essential Question(s) How does land change over time?
Stage 2: Evidence/Assess	
Know From the given investigation plan, students identify the phenomenon under investigation, which includes the following idea: the effects of weathering or the rate of erosion of Earth's materials. From the given investigation plan, students identify the purpose of the investigation, which includes providing evidence for an explanation of the phenomenon.	Do: Students will explore and investigate erosion and how that aids in shaping Earth slowly over time. They will do this with a variety of activities: They will build a soil hill to keep the land from eroding as well as a down hill water slope to examine water and wind erosion Kids get a real world experience on how we can help farmers, etc

Stage 3: Learning Plan

Engage: (1 to 2 days) Students will write the essential question in their notebooks. Have them in groups or partners share ideas about the essential question. Have a whole class discussion and document any questions or ideas students have on a chart to be revisited later. The crosscutting concept is cause and effect. Pose to students: How does cause and effect apply to changes over time? STEMscopes: Sugar Lab- Students will put sugar cubes in baby food jars and add water. They will shake it up and then let it rest and observe what happens to the sugar cube. They will then record in their science journals. Watch Bill Nye Video (erosion).

Explore: (2 days) Students will build a soil hill to keep the land from eroding. They will have access to a variety of materials and they will work in teams. Students will use cake pans, dirt, and various materials to test how well the dirt hill withstands the effects of water and wind. Students will examine the cause and effect of erosion as they conduct their investigations.

Explain: (2 days) Literacy connection in STEM Scopes (4 corners writing activity), Nat Geo and Wonders for articles to read, (during ELA rotations) and then write paragraphs about the article. Tree Map first and then add topic sentence and two details to support topic as well as passages from the science book for erosion and quick changes, reading and writing science books to help students find evidence to support their claims.

Tied to “regions” in the Social Studies unit. Look at the formation of land and how it applies to regions. What part does erosion play?

Elaborate: (2 days) Sand Castle- measure before and after – wind and rain- Students will be put in teams. Teams will create sand castles from putting wet sand in a cup and then turning it upside down. Students will then measure the height of their castle and document measurement. It is a good idea for students to keep a chart. Then they will use eye droppers to simulate rain and drop water on the castle. They should then record the measurement. They will do the same with the wind simulation using a straw to blow on the castle. Results will be compared. During the discussion students will have to support their claims with evidence from their investigations.

Evaluate: (1 day) CER, 3 quizzes (like games) in STEMscopes- key concepts and details from the investigation. Can assign to students.

Stage 4: Transfer

Knowledge Transfer

Cause and effect: Students should be able to identify cause and effect in other areas of Earth Science and connect it to the phenomena of Earth’s slow changes over time.

