Grade: 4

Program Title: Erosion with the Stream Table

Related Iowa Core Performance Expectations:

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [*Assessment Boundary: Assessment is limited to a single form of weathering or erosion.*]

4-PS3-1.Use evidence to construct an explanation relating the speed of an object to the energy of that object. [*Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.*

Future Considerations: Blend this program with the unit storyline developed by the classroom teacher.

Program alignment with the Iowa Core Science Standards:

Disciplinary Core Ideas (DCIs)	**Investigative Question**	**Investigative Phenomena**	**Practices (SEPs) Students will:**	**Cross Cutting Concepts (CCCs) Students will identify:**
ESS2.A: Earth Materials and Systems Water breaks rocks, soils and sediments into smaller particles and move them around. **PS3.A: Definitions of Energy** The faster a given objects is moving the more energy it possesses.	How does water shape the earth?	Go out to playground and look for examples of erosion. Bring in a sample rock with rounding Show pics of Maq. Caves	**Use a stream table model** to learn about erosion. **Make a model** to test how they might prevent erosion. **Construct explanations and design solutions** to control erosion.	**Patterns** that seem related to erosion. **Cause and Effect** relationships when experimenting with stream table. **Stability and Change** of the landscape due to erosion

Program components: The presenter will have students use the CCCs, the SEPs and the phenomena to figure out how to answer the investigative question and to grasp the disciplinary core ideas.

View examples of erosion in the vicinity – walk the culvert under Hwy 61, mulch run off under the peach tree, willow walkway, area around the rain barrels, edge of driveway to 63rd St., see if any action in the sandbox.

Now that we've explored some different types here, do they remember any examples from home or school?

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Whole class viewing of stream table operation with demos:

1. Show how materials are affected by their placement.
2. Kids write down their questions to use during model building.
3. How does water interact with each of the materials and discuss why.
4. Discuss the changes over time due to water.

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Design a landscape to best prevent erosion in their watershed using a limited set of materials/time. Students make models to test their design while gathering data on their efforts – compare designs (draw and build) and take notes on success or failure.

Each group gets a tray, set volume of grit, set volume of water, sponges (to mimic plants), stones, toy farm buildings and implements, rain tray, measuring cups, colanders, chamois cloths, plastic sheeting.

Measure the amount of grit runoff as a test of success- less grit means a better erosion prevention design. Visually observe then record the changes in the landscape.

Test designs in trays first then best 3 goes to the big table