Laarman Lesson Plan

Class: Earth Science Unit: Earth’s Features Standards: ESS2-5

Topic: The Water Cycle Date: 10/31/16

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| **Materials, Prep** | Small glass, large mixing bowl, food coloring, plastic wrap, dirt, coin; Chapter 15 book power point |
| **Anticipatory Set****-connection, motivation, relevance** | 1. Ch. 14 Smartboard Review2. Without water, life on Earth as we know it could not exist. Water is continually changing forms and locations on Earth in a process called the water cycle. What are the three forms of water? Write answers on the top of the board. The total amount of water on Earth and in its atmosphere does not change. |
| **Direct Instruction** | * Class diagram activity: Students are called at random to add to a large diagram on the whiteboard; all students should draw their own in their notebooks
1. Set the scene: draw some mountains, trees, and an ocean
2. How does water get into the atmosphere? What form is it in? Draw it on the diagram.
	1. Define evaporation: the process by which liquid is changed to vapor
	2. 86% of evaporated water comes from oceans
	3. Define transpiration: process by which plants and animals release water vapor into the air
	4. Define evapotranspiration: the total loss of water from an animal; evaporation and transpiration combined
3. How does water get from the atmosphere back to Earth? (precipitation) What does it have to do before it precipitates? (condensation) Draw the condensation process on the diagram.
	1. Define condensation: the change from a gas to a liquid
4. We already mentioned precipitation. What are the forms of precipitation? (rain, snow, sleet, hail) Draw precipitation on our diagram.
5. What happens to the water once it falls as precipitation? (runoff, soaked into groundwater, consumed by plants or animals, etc.) Draw these processes on our diagram.
* Explain the concept of water budget: income and expenses
1. What is the Earth’s total water budget? (balanced)
2. But local water budgets can be unbalanced in either direction. What might be the results? (floods, droughts)
	1. Show slides 13, 14
3. How do you think factors like wind, vegetation, and temperature affect a local water budget?
* Water use: show slides 16-19
1. How do you think you could get salt out of salt water? (heating it, freezing it, reverse osmosis) What’s wrong with this solution? (takes energy and burning of fossil fuels)
* Demonstration: Quick Lab, p. 377
1. Do you think the precipitation will have food coloring? What are some things you’ve learned in the past and today that might help you predict? Hints: Is precipitation always pure water? How does desalination work?
* 15.2 and 15.3 Power Point for student notes: River Systems
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Topic: Floods Date: 11/1/16

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| **Materials, Prep** | Laptops, vid quizzes |
| **Anticipatory Set****-connection, motivation, relevance** | Review: why would people settle in a floodplain? |
| **Independent Practice** | Students get laptops and study learning module at <https://www.as.uky.edu/sites/default/files/elearning/module12swf.swf> * + In-class assignment: write the six most important things learned
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| **Direct Instruction** | Begin “Flood!” video from Safari Montage while filling out vid quizzes |

Topic: Floods Date: 11/2/16

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| **Procedure**  | 1. Complete “Flood!” video
2. Discussion: How did humans impact flood risk on the Mississippi? What would you do in the shoes of the people featured in the video?
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Topic: Success Date: 11/3/16

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| **Materials, Prep** | Water Investigation Sheet |
| **Procedure**  | 1. Introduce assignment: Plan and conduct an investigation of the properties of water and its effect on Earth materials and surface processes
2. Place students into groups
3. Discuss possible categories of investigation
	1. Ice wedging
	2. Stream erosion and deposition
	3. Solubility and leaching of different materials
	4. Factors that affect erosion (possible factors include type of soil, amount of vegetation, moisture content of soil contours of land)
4. Student groups…
	1. Devise a question about the impact of water on Earth’s features and turn it in before the end of the period
	2. Review the aspects of a good investigation by reading pp. 10-13
	3. Come up with an hypothesis they wish to test
	4. Work on planning their investigations
	5. Submit to me a report on the materials that will be needed and the procedure that will be followed
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Topic: The Effects of Water on Earth’s Surface Date: 11/4/16

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| **Materials, Prep** | Materials as requested by groups |
| **Procedure**  | Student groups continue working on planning/executing their investigations |