Colorado Academic Standard Focus

Reading, Writing, and Communicating:

- Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (CCSS: RI.4.1)
- Determine the main idea of a text and explain how it is supported by key details; summarize the text. (CCSS: RI.4.2)
- Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. (CCSS: RI.4.3)
- Interpret information presented visually, orally, or quantitatively (for example: in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. (CCSS: RI.4.7)
- By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range. (CCSS: RI.4.10)
- Conduct short research projects that build knowledge through investigation of different aspects of a topic. (CCSS: W.4.7)

4th Grade Science:

- 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-ESS2-1)
- Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. (4-ESS3-1)

5th Grade Science:

- Support an argument that plants get the materials they need for growth chiefly from air and water. (5-LS1-1)
- Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. (5-LS2-1)

Additional standards can be easily met by utilizing the complementary lesson plans from the National Agricultural Literacy Curriculum Matrix, identified to the right.

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Stay in-the-know by subscribing to our free educator e-newsletter

This e-newsletter is geared towards educators and will include updates on our programs and resources, select lesson plans and activities from our Curriculum Matrix, and other information to connect educators and students. To subscribe, complete the form available here: http://bit.ly/2k3Ay0y

Lesson Plans to go with this *Reader*

The Agricultural Literacy Curriculum Matrix is an online, searchable, and standards-based database for K-12 teachers. The Matrix contextualizes national education standards in science, social studies, and nutritional education with relevant instructional resources linked to Common Core Standards. Below are a few lesson plans that could be used in conjunction with this *Colorado Reader*. Go to www.GrowingYourFuture.com and click on Curriculum Matrix (on the Home Page or under the Educator's Tab), search each title within the Curriculum Matrix to find these lesson plans.

Caring for the Land (3-5): Students will explain why people have different opinions regarding soil management and identify cause and effect relationships relating to agriculture and the environment.

The Soil Chain (3-5): Students will recognize their relationship to soil and model the connections between common objects and the soil.
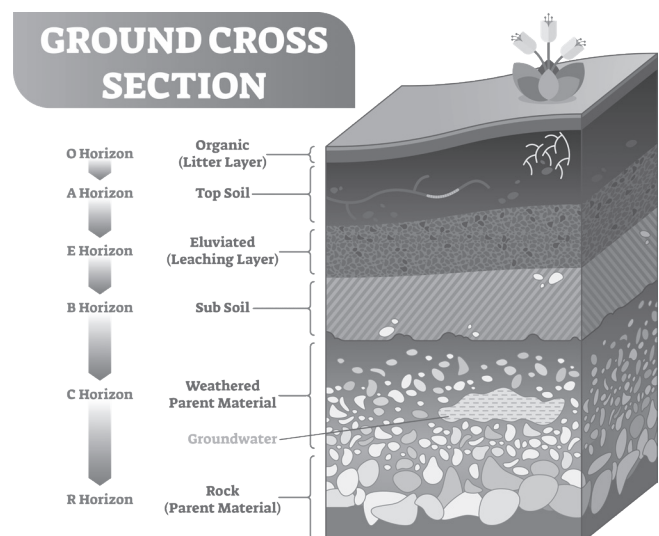
Climate Change Phenomena: Bananas in Our Breadbasket? (6-8):Students will explore the carbon cycle and evaluate associated phenomena of climate as they discover the impact climate change could have on the farms that produce our food.

Carbon Hoofprints: Cows and Climate Change (9-12): Students will explore the carbon cycle and evaluate the carbon footprint of beef cattle. Using critical thinking skills, students will use the Claim, Evidence, and Reasoning model to determine the effect of cows' methane production on the environment and investigate the extent cattle contribute to climate change.

Or use the search words "resources" and "climate" for additional free lessons and classroom activities.

Answers

Page 2 - What are the layers of soil?

GROUND CROSS SECTION

Horizon	Layer
O Horizon	Organic (Litter Layer)
A Horizon	Top Soil
E Horizon	Eluviated (Leaching Layer)
B Horizon	Sub Soil
C Horizon	Weathered Parent Material / Groundwater
R Horizon	Rock (Parent Material)

Science Experiment - Erosion Model

In this experiment, you will observe how plant life and ground cover minimize soil erosion.

Go to https://www.youtube.com/watch?v=im4HVXMGI68 to watch this experiment.

Materials:
- 1 x piece of ply wood (30cm x 30cm x 2cm thick)
- 6 empty 2 liter bottles
- Scissors and/or Stanley knife
- Wood glue
- Hole puncher
- String
- Bag of soil
- Mulch (bark chips, dead leaves and sticks)
- Grass seed or flowers
- Watering can
- Water

Procedure:
1. Prepare three of the bottles by cutting a rectangular opening out of the side of the bottles so they looks like planters.
2. Stick the bottles to the wood with wood glue, making sure the necks of the 3 bottles hang evenly over the edge of the board.
3. Fill each of the three bottles about half way with soil.
4. Do not add anything on top of the soil in the first bottle. In the middle bottle, cover the soil with mulch or dead leaves. In the third bottle, either plant grass (do this 2-3 weeks ahead of time) or flowers. If you are planting flowers, plant them tightly together and press down firmly to compact the soil.
5. Cut the other three bottles in half horizontally. Keep the bottom halves to use as collection bowls. Make holes with the hole punch on each side of the bottle, near where it was cut. Cut three identical pieces of string, roughly 10 inches long. Thread a piece of string through the holes and tie knots at each end to secure the string. Hang the string and bottle over the necks of the three bottles that are being used as planters.
6. Finally, make it rain! Slowly pour equal amounts of water in each of the planter bottles using the watering can. Pour the water in at the end furthest from the neck of the bottle to simulate rain moving through the soil. Observe the color of the water collecting in the bowls. You can add water to the bottles every day and see what happens to the soil over a period of a week.

Questions to answer:
1. What do you observe in each of the collection bowls?
2. Why do you think they are different from each other?
3. How do plants and ground cover help minimize erosion?
4. How does this experiment apply to farming? Based on this experiment, how are farmers helping soil health?