

Soil Science Curriculum

Content and lab derived from the USDA-NRCS Guides for Educators. Go to www.nrcs.usda.gov/soils for the Guides and additional pictures and diagrams. This lesson plan was adapted for South Dakota from the University of Nebraska Institute of Agriculture and Natural Resources, CROPWATCH.

January 2018

Soil Science Capstone Activity

Approximately 30 minutes

Objectives

By the end of the lesson, students will know or be able to:

- Use the scientific method to conduct an experiment in one or more areas of study addressed in the unit.
- Report experiment hypothesis, procedures and results in an Agriscience Fair display and research paper.

Preparatory Work

- Review the www.sciencebuddies.org website to review the process students will go through to identify an experiment

Materials

- Specific to each student's experiment

Enroll the Participants *(Approximately 3 minutes)*

Ask students to recall what they remember from the scientific method web quest.

Ask students to recall what they remember about the introduction to the Agriscience Fair event offered through FFA.

Provide the Experience *(Approximately 5 minutes)*

Ask students to share any examples that are familiar to them in terms of completing an experiment or attending a science fair.

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Label the Information *(Approximately 13 minutes)*

Inform students that during the next several days and weeks, they will conduct a soil science experiment, using one of the unit topics as a starting point for their experiment creation.

- Soil Organic Matter
- Bulk Density
- Soil Health Measurement
- Soil Respiration
- Soil Electrical Conductivity
- Soil pH
- Soil Nitrogen
- Soil Phosphorus
- Soil Infiltration

Demonstrate the Relevance *(Time varies)*

Instruct students to use the scientific method to construct their experiment, providing guidance and approval at each phase. Use the attached resource to help you complete the assessment of each checkpoint.

Provide students with the parameters specific to your classroom in terms of the following items:

How much class time will be provided for students to conduct their experiment? How much must be completed outside of the classroom?

How much time will be provided for students to work on their Agriscience Fair display?

When is the due date on the experiment?

What resources will be provided by the school/classroom? (Make sure you make good use of the resources provided through the soil science grant!)

Will the experiments be conducted individually or as a class?

Will the students present their project to someone other than the class? If so, who?

How much will the entire activity be worth in terms of points? How much will each step be worth?

Review the Content *(Time varies)*

At the conclusion of the experiments, direct students to report their results to the class or to another pertinent group.

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Celebrate Student Success *(Time varies)*

Take time throughout the duration of the experiment design and implementation to commend students for their efforts and independent work. After students share their results with their classmates, consider presenting each student with their own “Super Scientist” award.

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Scientific Method Step	
What is the question?	
What sources are you using for the background research? Attach your research to this document.	
What is your hypothesis?	
How will you test your hypothesis? What supplies will you need? How much time will the experiment take? Who will be involved? What expenses might exist? Where will you conduct the experiment? How will you ensure safety during the process? Why did you choose this experiment? What are the variables? What type of environment is needed? Attach the larger plan to this document if needed.	

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What data will/did you gather during the experiment? How will you organize the data?
What conclusion(s) can you draw from the data?

What are the results of your experiment?