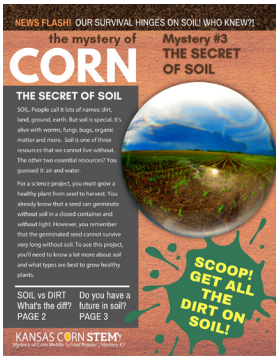

MYSTERY #3
THE SECRET OF SOIL

Middle School Teacher Guide

KANSAS CORN STEM

This teacher's guide is broken into the different sections with suggestions of how to use the reader in the classroom and provides ideas on how to extend learning for your students. A PDF version of this teacher guide with active links can be found at kansascornstem.com under Mystery of Corn Reader.

Reader QR Code Links

If your students are unable to use QR codes in the classroom here are the links to share the videos in alternative ways.

- Difference between Soil and Dirt- https://agreenhand.com/difference-between-soil-and-dirt/
- Copy of Google Slides - https://qrco.de/soilslides
- Introduction to Soil Part 1 by Science Basement- https://youtu.be/p166fVxwyuY
- AgExplorer- https://agexplorer.ffa.org/search/node/soil
- How is Soil Created?- https://youtu.be/hpO6AGQ3wvQ

Vocabulary Words

There are eight vocabulary words to be found throughout the reader. They are bolded with a small explanation to help define the word. Other ways to learn more about these words are:

- Have your students find the definitions to the words on their own before reading.
- Draw pictures of the words which will help them make meaningful connections.
- Have them create online or physical flashcards, graffiti posters or a PowerPoint presentation to help them understand the meaning of the words.

Google Slides

Focusing on the differences between soil and dirt, students will have the opportunity to read more about both and complete a Google Slide activity.

- If students do not have access to a computer, you can have them make a simple T-chart on paper and write the information in the correct column.
- Using the QR Code link will automatically make each student their own copy when they click on it.
- If you have access to Newsela, search the topic soil or use the link here, https://newsela.com/search?needle=soil. There are some wonderful articles on how soil is formed, soil erosion, and even the use of soil to help straighten the Leaning Tower of Pisa.

Introduction to Soil Worksheet

The provided worksheet can be used to access students' learning from the "Introduction to Soil Part 1" video. You can provide the worksheet before the video and have students complete as they watch or provide afterwards as an assessment of what they learned.

True or False
After listening to the videos and reading the material, the student should be able to answer the True or False questions. They are all true, but if you have students do additional research, they may argue that the second question is false as they will find some claims that it could take 100 years to create topsoil. Opinions vary and it is largely dependent on the environment in which the soil is being created. Based on United States Department of Agriculture (USDA) information, the minimum number of years on average is 500 years.

Corn Careers
This section allows students to explore soil science careers. Students will be able to research more careers related to working in soil science.

- You can have students discuss what careers they research, write a summary of their findings, or do a group share of what careers they learned about that they had not heard of before.

Corn Science Investigation
This Soil Science Investigation is a great time to continue discussing with students the materials that make up soil, how soil is different from dirt, and the importance of a healthy soil for plant growth.

- The four-ounce containers can be purchased on Amazon. You can get a pack of 100, including lids, for about $15. The additional small materials added to the slime soil model will represent microbes, minerals, nutrients, inorganic, and other various mediums found in soil. Link to containers: https://amzn.to/3BIK1gB
- There are also several other mini lab extensions that can be done using the compiled list from NRCS Soil Scientist, Kim Vinson. The majority of these activities require minimal, easy to access materials. They've been included as an additional teacher resource page.
- If you have the ability to download software to student computer, STEAMpowered.com has an educational game called "Secrets of Soil" that can be played for free after it is downloaded and a free account is made. The link to app for the STEMpowered soil game can be found here: https://store.steampowered.com/app/1610820/Secrets_Of_Soil/

Additional Kansas Corn STEM Resources
This reader can be used as a stand-alone activity, or you can pair it with other Kansas Corn STEM offerings.

- ***Lessons*** - Soil Sleuths and Soil Erosion lessons. You can find the lesson guide and training videos here https://kscorn.com/topic/soil/
- ***Breakout Box Challenge*** - Challenge your students to learn more about soil using a breakout box. *Spread It. Grow It. Know It. and Sifting Through Soil* would go well with this reader. It is available online or for physical breakout boxes. Check out the lessons and others at https://kscorn.com/topic/breakout-box/
- ***Guest Speaker*** - Request a guest speaker to visit the classroom and expand learning about soil and corn. https://kscorn.com/guestspeaker/
- ***Lessons*** -Other middle school labs can be found in the lesson library. Check out the TEACH-FLEX lessons that use easy to find classroom materials to complete a lab. https://kscorn.com/lesson-library/
- ***Seed to STEM Workshop*** - Seed to STEM is a 2-day workshop where teachers learn 10 labs, attend a farm dinner and ethanol plant tour and receive $500 in supplies to use in their classroom. To learn more about the workshop go to - https://kscorn.com/middle-school-science-teacher-professional-development/#AboutSeedtoSTEMWorkshops