



Science



Math

# SOIL SAM

## Grade Level

K-5

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will have a better understanding of the growth and development of a seed.

## Materials Needed

- Potting soil
- Untreated grass seed
- Baby food jars
- Knee-high stockings
- Water
- Jiggle eyes
- Fabric

## Standards

### Common Core

CCSS.Math.Content.3.MD.A.2; 3.MD.B.3

### NGSS

3-LS1-1; 4-LS1-1.A

## Lesson Summary

This lesson is designed to help students deepen their understanding of seed growth by creating a fun character named Soil Sam. Take it a step further and test variables that might affect seed growth!

## Suggested Sequence of Events:

1. Read through IAITC Soil Ag Mag to learn about soil and its properties. Interactive online versions can be found on our website.
2. Complete the activity following the procedures:
  - Using a knee-high stocking, place some grass seeds in the toe where you want the grass to grow. The toe of the stocking is the top of the head for Soil Sam. The grass will look like hair when it grows.
  - Pack a handful of soil in the end of the stocking on top of the grass seeds. Make sure the ball of soil is slightly larger than the baby food jar.
  - Tie a knot in the stocking under the ball of soil.
  - Completely wet the head of Soil Sam. Place the opened end of the stocking (the bottom of Soil Sam) in the jar filled with water, making sure the head is above the mouth of the jar. The end of the stocking will absorb the water to feed the grass seeds, which will germinate through the stockings. You may have to poke a few small holes in the top of Soil Sam to help the grass get through.
  - Now decorate! Give your Soil Sam a face!
  - Water as needed and be sure to cut the grass (hair) and style as desired. Will the grass grow better or faster with fertilizers? Try it out. Add different fertilizers to the soil and water to see which grows best.
4. Reflection of activity. Compare with a classmate at the end of the experiment. Make sure you compare with someone that has used a liquid other than water, or someone who placed their Soil Sam in a different location. Discuss the differences observed.

# TEACHER RESOURCES

## Extension Ideas:

- Read “[Diary of a Worm](#)” by Doreen Cronin
- Read “[A Handful of Dirt](#)” by Raymond Bial
- Have students create a comic strip showing the process of germination.
- Have students write a story from Soil Sam’s perspective.
- Show a labeled diagram of a grass plant.
- **Scientific Inquiry:** Have students think more deeply about plant growth and create their own question, hypothesis, and experiment to test! Will Soil Sam’s ‘hair’ grow faster in Mountain Dew, coffee, or water? Does the amount of light affect the growth of the ‘hair’? Do different fertilizers, potting soils, temperature, etc. affect plant growth differently?
  - Have students use the “Scientific Inquiry” worksheet to test their variables.
  - Ideas of substances to add to the water: store-bought liquid fertilizer, soda, apple juice, liquid dish soap (do the scents affect it too?), coffee, lemon juice.
  - Ideas of substances to add to the soil: store-bought fertilizer stick, coffee grounds, baking soda, Epsom salts, or try different types of soils.
- Measure Soil Sam’s ‘hair’ each day. Make a bar graph to represent the data collected. Have students compare their data with other classmates who used a different variable.
- Create a large chart or graph that shows all students’ data and hang it at the front of the classroom to compare and contrast how the variables affect plant growth.
- Watch a time lapse video of a grass growing.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!

\*Farmers have to be careful to not add too much fertilizer to their crop. They go to special classes and use mathematical problems to figure out the right amount for their specific plants and size of field. You shouldn’t use too much fertilizer either, but you can experiment with different amounts! What would happen if you did use too much, or too little?





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# SCIENTIFIC INQUIRY

It all starts with a question! Everything we have today came from someone questioning the current beliefs, technologies, and practices of that time with hopes to gain new knowledge, discover something new, or to make something better or different!

**Scientific Inquiry** is investigating and finding evidence from observations in order to create logical explanations and answer questions!

Phenomenon:

What do you already know about this phenomenon?

Write 3 questions that will help you learn more about the phenomenon:



**STOP**

Before you move on, you want to make sure you know exactly what you're investigating! Choose 1 question you hope to answer through your investigation and circle it!

Brainstorm Box: What type of experiment could you design to answer your question?



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# SCIENTIFIC INQUIRY

Materials:

Control:

Variables:

Now that you brainstormed, finalize your experiment. Using complete sentences, explain how you will set it up!



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# SCIENTIFIC INQUIRY

Use the blank space below to record observations and data!

Did your experiment help answer your question? Explain, using evidence as support!

What was the most challenging part of this activity?