Speedy Soil

KEY CONCEPTS: Soil, Natural Ingredients, Mixture, Planting, Seeding; *Soft Skill: Grit*
AGE RANGE: 2nd - 5th
TIME: 30-45 minutes

OVERVIEW: What is the scoop on soil? Just like humans need food, water and air to grow and survive, so do plants! Soil provides these basic needs for plants and therefore is an essential part of a healthy garden. Farmers rely on healthy soil mixtures so their plants can grow big and strong. Though it may just look like dirt on the ground, there is so much more to soil, which is full of living organisms! In this lesson, you will learn all about the qualities that make up good potting soil, follow a recipe to make a soil mixture, and use this mixture to plant a seed.

MATERIALS: **This is a resource intensive lesson. If you don't have access to planting materials or a garden, read the Modifications section of lesson plan for alternative activities**

- Computer, iPad or phone to watch video
- Pencil and/or colored pencils
- Paper or Journal
- Potting Soil Materials: Compost (mushroom compost or other); Vermiculite; Coco Coir
    - Other optional additions: Worm Castings, Pearlite, Pre-mixed topsoil
- Small pot
- Mixing tub or other container
- Water
- Seeds (**Snap Pea Seeds** if using Green Heart Kits)
- Lowcountry Seasonal Produce Chart[1]
- The Dirt on Dirt Video[2]
- Soil Mixture Recipe Card
- Taste-Test, carrot sticks or celery dipped into black bean hummus (to look like soil), or another healthy snack to "taste-test"

SET UP: If you plan to mix soil and plant a seed, get all materials gathered ahead of time. Coco Coir needs to be pre-soaked for 15-20 minutes before it will shred. This lesson can get messy, so make sure to lay down a towel or mat if doing it inside.

WARM-UP

WATCH: Green Heart Rules of Respect video

WRITE DOWN: The 3 Green Heart Rules in your journal:

1. Respect Yourself
2. Respect Your Green Heart Buddies
3. Respect the Earth

THINK: What does your body need to survive? Food, water, and air are all things that help you to live. Just like you need these things, so do plants in a garden! Soil helps plants to meet these needs, which is why it's so important to a healthy garden.

ACTIVITY

WATCH: The Dirt on Dirt Video[2]

ANSWER: in your journal, answer the following **questions**:

1. What is soil and why is it important?

> *Hint: Soil is the upper layer of earth in which plants grow that is made up of a mix of minerals, water, air and organic matter. Soil is important because it provides nutrients, water, air and space for plants to grow. Healthy soil supports healthy plants.*

2. How is soil made?

> *Hint: Soil can be made in many different ways. The soil creation process can be: #1. **Slow:** Leaves fall creating layers on a forest floor, and slowly break down into soil. #2. **Medium:** Food scraps and yard waste can break down & turn into soil by through composting. #3. **Quick:** Humans can create healthy potting soil (perfect for growing plants from seed) by mixing different earth materials.*

THINK: to yourself, Where do the bags of soil come from that you buy in the store? If you don't have access to bags of soil from the store, how can you create it yourself? Your job today is to become a soil expert, so that you can create a healthy soil mixture!

MAKE: a healthy speedy soil recipe by following along with the video, How to Mix, Test and Seed into Soil. **If you do not have the materials on hand, write down the steps and illustrate a picture of the process for you to try another time!*

STEP 1- ***RECORD:*** the soil recipe in your journal, so that you have it on hand while mixing soil. List the ingredients and their function.

- Compost: Provides nutrients
- Coco Coir: Holds water
- Vermiculite: Allows for drainage

STEP 2- ***CREATE:*** your own potting mixture, scoop equal parts of each ingredient from the recipe into your mixing container.

STEP 3- ***MIX:*** your soil using your hands. Add equal parts water & mix again. Pick up a handful and shape it into a snowball. Squeeze the ball to check the moisture level. You want your soil to stick

together like a snowball, with just a few drops of water coming out when you squeeze! If it is falling apart, add more water.

STEP 4- FILL & *PLANT:* Once your mixture is ready, ***FILL:*** your pot with your soil mixture all the way to the top. ***LOCATE:*** your seed packet & research how deep to plant the seed, and how many seeds you can put in your pot. *for snap peas, plant 1 to 1-1/2 inches deep and about 2 inches apart.

- *See Square Foot Gardening Handout for helpful planting tips.* ***COVER:*** the seed with soil (tuck it in) and wish it good luck! Give your seed some extra water and place in a sunny location - a windowsill or outside. Keep the soil moist until the seedling pops up. Then water about 1x/week. **Snap Pea seedling should appear in 7-10 days**

TASTE TEST

In every Green Heart lesson, there is the option to do a "taste-test." This is an opportunity to be brave and try a new, healthy food!

PREPARE: Just like plants get nutrients from soil, your body gets nutrients from food. Prepare your taste-test. Idea for today's taste test: Carrot or celery and black bean hummus (to look like soil).

WATCH: How to do a Green Heart Taste-Test: Rules & Ratings.

TRY: 3..2..1.. Taste-test!

RATE: After trying your taste-test, use describing words to explain what you tasted (salty, sweet, sour, crunchy) and give it a Green Heart rating.

REFLECTION & CONCLUSION

REFLECT: on your healthy soil mixture recipe. Discuss out loud, or write your answer to the following **questions** down in your journal:

1. Why is healthy soil important? What are some consequences of a farmer having unhealthy soil?

2. List the different ways in which soil can be made.

3. List three important components of good potting soil.

4. Formulate a question about soil that you are still curious to know the answer.

CONCLUDE: Farmers rely on healthy soil to grow vegetables and plants. Healthy *speedy* soil is made up of four components: 1) Coco Coir: natural ingredient that holds water, 2) Compost: broken down food scraps and dead leaves/sticks that provide nutrients, 3) Vermiculite: a mineral that allows for drainage.

DIGGING DEEPER

Modifications:

- If you don't have access to materials to mix your own soil, you can illustrate the mixing process instead using a pencil or coloring materials. On a piece of paper, 1) draw each ingredient individually and label it 2) illustrate the soil mixture process and then, 2) design your dream garden that you could grow using the healthy, fertile soil!
- Instead of mixing soil, you can explore soil and dirt that you find outside. What do you notice in the soil? What is growing in it? Does it seem healthy? If you have a backyard or outdoor space, you can plant seeds directly into the ground.

Extensions:

- Explore compost. Compost is used to provide extra nutrients to our soil and plants. Create a homemade organic fertilizer using a combination of

ingredients such as chopped and dried banana peels, coffee grounds, crushed eggshells and compost.
- Practice reading the back of seed labels. Compare and contrast the packets to see what different needs the seeds have in order to grow.
- Do a Soil Water Dance as a movement break.
- If students are at a higher grade level or you want to add a layer of complexity to the lesson, check the soil to ensure that the pH is between 6-7 using a pH strip. Have students brainstorm and read about ways to adjust soil pH level to get it to desired levels.
- Cross-curricular Lesson Connections:
    - Ask students to sort soil based on color, hardness, shape or size.
    - Find a quiet place to write, or read a book outside in nature. Check out these Farm to School books.
    - Count how many bugs you find in the soil and classify the different types. Connect your knowledge of healthy soil and the type of bugs that live there!

Educator Notes:
- Use a KWL chart of what students know, want to know and what they learn about soil to track learning.
- Split students into small groups to mix their own soil or do it as a large group and call up individual students to pour in different components. Encourage collaboration and teamwork.
- On choosing seeds - Some seeds do better in pots than others, and some are more easily transplanted (moved to a bigger pot or into the ground, without killing the seedling).
    - Plants that do well in small pots: spinach, peas, lettuce, swiss chard, basil, lavender, calendula, nasturtium (will trail) sunflower, dill.
    - Plants that are okay to transplant: broccoli, kale, cauliflower, squash, cucumber, melon. Most of the seeds mentioned before can also be transplanted.
        - plants we don't recommend transplanting (it's possible but not easy) are: lettuce, spinach, swiss chard, carrots, beets, radish, turnip, beans
- Soft Skill: Grit. (Strength or determination; the ability to keep working through a challenging moment.) Students will work to mix the soil with their hands and continue adding ingredients until they have the perfect mixture for their seeds. This lesson takes GRIT to keep going even when it gets hard, or messy!

SCIENCE STANDARDS: 3.S.1 Ask questions that can be (1) answered using scientific investigations or (2) used to refine models, explanations, or designs.
3.E.4A.1 Analyze and interpret data from observations and measurements to describe and compare different Earth materials (including rocks, minerals, and soil) and classify each type of material based on its distinct physical properties.
3.E.4A.3 Obtain and communicate information to exemplify how humans obtain, use, and protect renewable and nonrenewable Earth resources.

HEALTH STANDARDS: M-K 5.1 Demonstrate the ability to cooperate with others (e.g., sharing, listening, taking turns).

References:

1. Coastal Conservation League GrowFood Carolina - 2020 Annual Crop Calendar
2. http://themicrogardener.com/easy-diy-potting-mix-recipe/
3. http://www.naturallivingideas.com/tips-recipes-for-homemade-organic-fertilizer/
4. Plant & Plate, Square Foot Gardening Handout