Can You Dig It? Dirt Dip Facilitator Notes

Objective: Students will explore the components of soil as well as different soil types through hands on investigations and simulations, featuring a cooking demonstration.

Recipe Category: Soil & Composting, Cooking & Tasting

Cooking Time: 25 mins

✓ **Level of Difficulty:** Grade 3

Recipe Ingredients:

Introduction to Soil:

- ☐ Soil Samples in bowls: Coconut husk, dirt, compost…
- ☐ Magnifying Glasses (optional)

Components of Soil

- ☐ Material Cards (Water, Air, Organic Material, Mineral Material)
- ☐ Diagram of Particle Sizes: Sand, Silt, Clay
- ☐ 1 large glass jar or glass bowl
- ☐ 1 large can of refried beans
- ☐ 1 can of corn kernels (opened, drained), or fresh kernels from one cob of corn
- ☐ A teaspoon
- ☐ Ground Cumin

- ☐ Salt (kosher)
- ☐ Bunch of fresh cilantro
- ☐ 1 lime (cut in half)
- ☐ 1 packet of Tortilla chips (real corn, low salt if possible) or fresh tortillas

Curriculum Links:

Grade	Subject Area	Ontario Curriculum Links
3	Science & Technology	*Understanding Life Systems* Investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow (i.e. the nutrient density of the soil). (O) • 2.4 Investigate ways in which a variety of plants adapt and/or react to their environment, including changes in their environment, using a variety of methods. (S) • 2.5 Use scientific inquiry/experimentation skills and knowledge acquired from previous investigations, to investigate a variety of ways in which plants meet their basic needs. (S)
		Understanding Earth and Space Systems: Investigate the composition and characteristics of different soils. (O) • 2.2 Investigate the components of soil, the condition of soil and additives found in soil using a variety of soil samples from different local environments, and explain how the different amounts of these components in a soil sample determine how the soil can be used. (S) Demonstrate an understanding of the composition of soils, the types of soils, and the relationship between soils and other living things. (O) • 3.1 Identify and describe the different types of soils. (S) • 3.2 Identify additives that might be in soil but cannot be seen. (S)

		• 3.3 Describe the interdependence between living and non-living things that make up soil. (S) • 3.4 Describe ways in which the components of various soils enable the soil to provide shelter/homes and/or nutrients for different kinds of living things. (S)
	Health & Physical Education	*Healthy Living* Demonstrate an understanding of factors that contribute to healthy development. (O) • C1.1 Demonstrate an understanding of how the origins of food (e.g., where the food is grown, how it is made) affect its nutritional value and environmental impact. (S)

Introduction to Soil: (5 mins)

Tell the students that today we will be learning about soil. Ask the students "*What do you know about soil?*" You may need to give some prompting questions to tap into their prior knowledge such as "*What is it*? "*Where do we find it*?" "*Where does it come from*?" "*What does it look like*?"

Pass around three different "soil" samples for sensory exploration

- *Dirt* from the garden
- *Coconut Husk* from the garden centre (imported from tropical locations!)
- *Compost* from worms

Briefly investigate how the samples are the same or different to each other

- Ask students to describe the *colour, texture, consistency, moisture, smell, origin* (where it came from)

After looking at the different examples, ask students what they would include as the definition of soil. i.e. *What did those soil samples all have in common*? Take a few examples and then share the definition with them:

Soil is: "*a substance made up of organic material, mineral material, water and air*."

Give examples:

- *Organic material* comes from plants and can be things like decomposed leaves
- *Minerals* come from rocks and can be calcium or iron

Components of Soil: (5 mins)

All soils have four different things in common: Organic material, mineral material, water and air.

**Show the soil component cards*

These are four ingredients that when added together become soil. It's kind of like cooking, you take separate ingredients and when you add them all together they become something else!

Ask students for an example of something they like to eat and break down the ingredients as an example.

- *You like soup? Well that is when you take carrots, potatoes, and onions and mix them together to become something new, soup*!

"Dirt Dip": (15mins)

Tell students that you'll be making a *soil snack* to share together! To make the snack, you can use different ingredients that when added together become something different. Here, the different vegetables, spices and beans when added together will become *Dirt Dip!* This is just like when we have four different components, or ingredients, that when added together becomes soil! We're going to use these ingredients to learn more about the ingredients in soil.

Add each ingredient in the following order to prepare the dirt dip:

1. First, to make your soil snack, add some ingredients that represent ***mineral material***.
    a. **Show the mineral material card*.
    b. Mineral materials come from rocks that have been broken into small pieces. These pieces can be many different sizes. Some of the biggest pieces are sand, to represent the sand; we are going to be using some corn kernels.
    c. Layer the corn kernels into the jar or bowl.
2. Using the **particle size diagram*, show how there are different sizes of mineral material.
    a. Some smaller mineral materials are called *silt particles,* these are much smaller than sand, but are made out of similar materials.

b. In our soil snack, we are going to represent these silt particles with refried beans.
c. See how the beans are in smaller "particles" than the corn? This is just like how silt is smaller than sand.
d. Add the refried beans on top of the corn in the jar or bowl.

3. Some mineral materials are extra tiny! These particles are called clay – they are even smaller than silt and are WAY smaller than sand.
    a. We are going to use these spices, cumin and salt, to represent these really, really tiny clay particles.
    b. Add ½ tbsp of cumin and one pinch (or ¼ tsp) of salt to the jar or bowl. Have students look at the difference in size. Refer to the soil particle diagram.

These mineral materials not only provide minerals for the soil but also provide structure to the soils with their solid shape.

4. So mineral material is just one component of soils, another is ***organic material***.
    a. **Show the Organic Material card.*
    b. Organic materials are things that come from plants, like rotten leaves, decomposed roots, twigs, branches, grass clippings, etc. The organic material has lots of nutrients that when broken down get added into the soil.
    c. In our example, we are going to use some cilantro, it even looks just like leaves on a tree!
    d. Add ½ a handful of cilantro to the jar or bowl.
    e. The organic material and water work together. The organic material works like a sponge, absorbing water and keeping it available for roots to drink up!
5. Review that you have organic materials and mineral materials, but is it soil yet? Nope, something's missing! We need some **liquids**! In soil, there is always some water.
    *a. *Show the Water card.*

b. This provides liquids for all of the plants and microorganisms in the soils to drink.
c. In our snack, we are going to use this limejuice as the water.
d. Squeeze half of a lime into the jar. Watch as the lime trickles down past all of our "soil" ingredients.

6. There is one more component of soil – it's hard to see, it's even already there! Does anyone know? **Air**!
    a. We are going to add more air to our soil mixture here by turning the mixture around with this spoon.
    b. Watch as these snack ingredients mix together to form something new – a dip! This is what happens when air, water, organic material and mineral material mix together to become soil!

When everything is all mixed well, hand out the tortillas and spoon some of the dirt dip onto each tortilla for the students to taste.

Wrap-Up:

If time, you can review the three different soil samples, asking whether all three samples have each of the four components of soil.

Ask students if they can think of anyways to make healthy soils? What are some ways that we can not only protect our soils but make them even better!

- One way is to *create compost*! If we place our food scraps in the green bin at home, or if we start a worm bin, we can turn our food scraps into healthy, nutrient rich organic material! This organic material adds tons of nutrients to our soils and also holds water in the soils for plants to drink!"

Serving Suggestions:

Material Cards could look like this: