

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02;
CRP.04; CRP.06; CRP.08

Appendix 3: Soil

Created: Summer 2020 by the National FFA Organization
Part 1

DIRECTIONS:

Read "Ag 101: Soil Horizons" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.

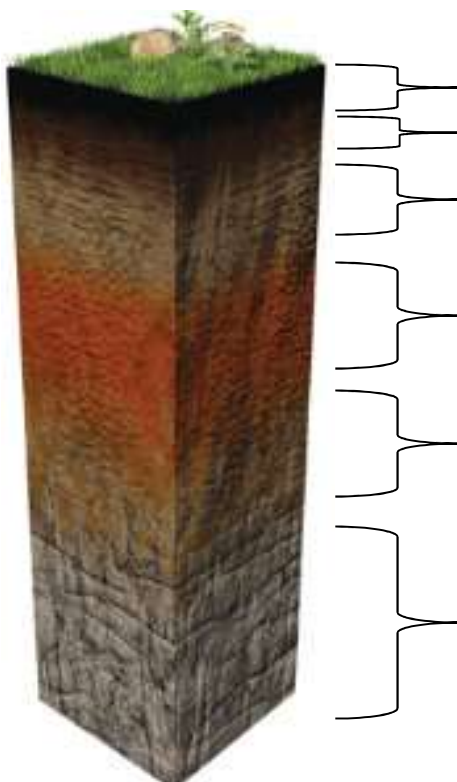
	<u>Letter</u>	<u>Horizon Name</u>	<u>Short, one- to five-word description</u>
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Image from [Soils4Kids](#) from the Soil Science Society of America.

Why is it important to understand soil?



Identify two ways soil has impacted you today.

1. _____
2. _____

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CRP.04; CRP.06; CRP.08

Part 2

DIRECTIONS:

While thinking about each basic horizon of a soil profile, you are going to create your own soil profile using everyday items that could represent each horizon.

1. Select a category of everyday item you would like to use. (Example: candy)
2. Draw a soil profile and use different items from that category to develop each layer of the profile. (Example: Oreo cookies for bedrock) Be sure to select items from your category that match the color, look and texture of the actual soil profile horizons.
3. Label each horizon with the representative letter and name. (Example: O layer = organic material)

Category Selected:

Letter: _____

Name: _____

Letter: _____

Name: _____

Letter: _____

Name: _____

Letter: _____

Name: _____

Letter: _____

Name: _____

Letter: _____

Name: _____

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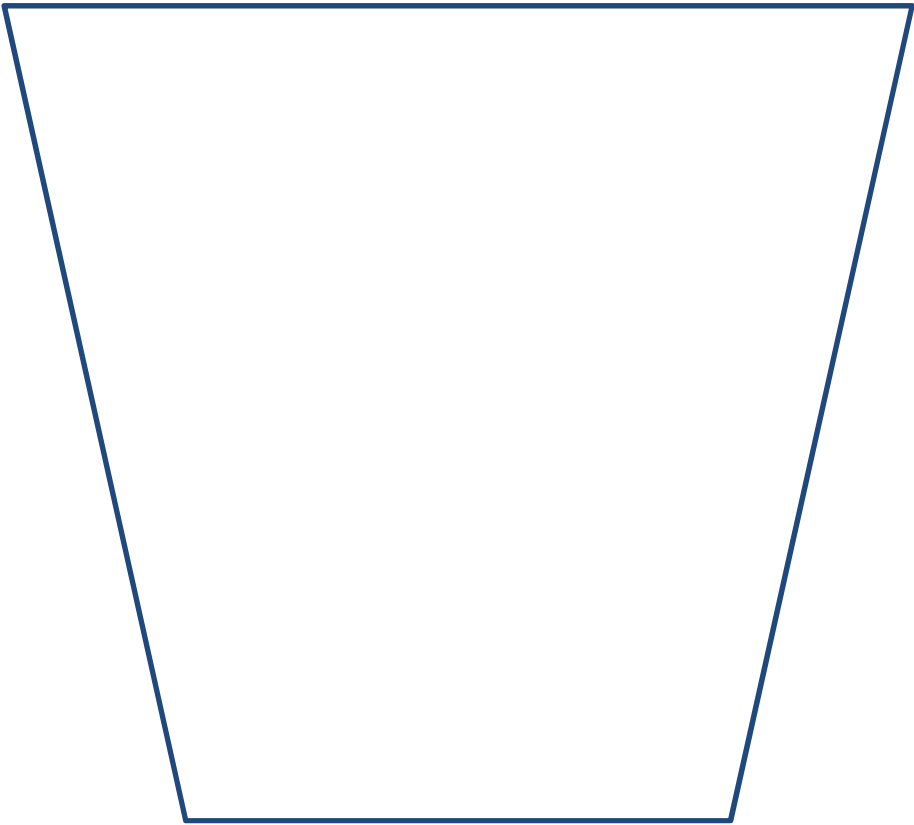
Part 3

DIRECTIONS:

Now let’s put together a physical representation of what soil profile looks like! In this lab, you will follow along with your teacher and complete the chart below. During this time, you will be adding items to a cup you have been provided by your teacher. In the cup diagram at the bottom of this page, draw and color the items being added. Be sure to label the cup with the letter and horizon as you go. To complete the conclusion questions, refer to the “Ag 101: Soil Horizons” article in the summer 2020 issue of *FFA New Horizons*.

Horizon Letter and Name	Represented by	Description of Appearance

Your Soil Profile Cup



NAME: _____

1. Which horizon of the soil would be the richest in nutrients for plant growth?

Why?



3. The E horizon is not always represented in all soil profiles. In what type of site would an E horizon be found?

a. _____

b. _____

2. Which horizon of the soil do we test for the texture in a soil judging competition?



4. Which horizon is known as the zone of accumulation?

Why?

5. What is the leaching process in horizon B called?



6. Which layer is most likely to be caused by disturbance from plants or animals?

Why?

7. What is the deepest horizon in the soil pit before the bedrock?



8. The bedrock layer is commonly made up of what materials?

a. _____

b. _____

c. _____

9. Using [AgExplorer.FFA.org](https://www.agexplorer.org), identify 3 careers in which having background knowledge in soil science would be extremely important.

a. _____

b. _____

c. _____

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CRP.04; CRP.06; CRP.08

Part 4

DIRECTIONS:

Now let's find out what the soil profile looks like in your area. Using the following resource from UC Davis, <https://casoilresource.lawr.ucdavis.edu/gmap/>, find your home and school on the map by using the "menu" button in the top left corner. Once you have found these two points on the map, answer the following questions using the content in the left side bar. NOTE: You must click on a specific spot and drop a red dot to have specific information populate in the side bar.

Home

1. Click on "map composition." What types of soils are present?
2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located?
3. Select one of the soil types present and identify the taxonomic order.

4. Draw the soil profile.

School

1. Click on "map composition." What types of soils are present?
2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located?
3. Select one of the soil types present and identify the taxonomic order.

4. Draw the soil profile.

How can understanding the soil in your local area help you in the future?

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CRP.04; CRP.06; CRP.08

Teacher Lab Sheet

DIRECTIONS:

In this lab, students will use food to create their own soil profiles.

Supplies Needed:

- Clear plastic cups (1 per student)
- Plastic spoons (1 per student)
- Organic material (O): coconut colored green (if you have coconut allergies, sprinkles can be used instead)
- Topsoil (A): chocolate pudding (works well in the individual cups)
- Subsoil (B): vanilla pudding (works well in the individual cups)
- Parent Material (C): Crushed vanilla wafers
- Bedrock (R): Partially broken Oreos
- Optional: gummy worm (1 per student)

1. Prior to the beginning of class, have all materials purchased and prepared. Hide the materials so students cannot see them as they enter the class.
2. Hand out plastic cups and spoons to each student.
3. Tell students you are going to start from the bottom of the soil profile and work your way up. *Who can tell me which horizon is the deepest?* The answer would be the R horizon, or bedrock. *Who can tell me what everyday items would be a good representation for the bedrock layer?* Answers may include anything that could "resemble" a bedrock layer. *Today, we are going to use Oreos.* Walk around the classroom and place some Oreos in the bottom of each student's cup. During their wait or once they have received their Oreos, they should add the layer to their charts and draw the Oreos in their cups.
4. *Who can tell me which horizon is on top of the bedrock?* The answer would be the C horizon, or parent material. *Who can tell me what everyday items would be a good representation for the C horizon?* Answers may include anything that could "resemble" the C horizon. *Today, we are going to use crushed vanilla wafers.* Walk around the classroom and place some crushed vanilla wafers in each student's cup. During their wait or once they have received their crushed vanilla wafers, they should add the layer to their charts and draw the crushed vanilla wafers in their cups.
5. *Who can tell me which horizon is on top of the C horizon?* The answer would be the B horizon, or subsoil. *Who can tell me what everyday items would be a good representation for the B horizon?* Answers may include anything that could "resemble" the subsoil. *Today, we are going to use vanilla pudding.* Walk around the classroom and place some vanilla pudding into each student's cup. During their wait or once they have received their vanilla pudding, they should add the layer to their charts and draw the vanilla pudding in their cups.
6. *Who can tell me which horizon is on top of the E horizon?* The answer would be the A horizon, or topsoil. *Who can tell me what everyday items would be a good representation for the topsoil?* Answers may include anything that could "resemble" the topsoil. *Today, we are going to use chocolate pudding.* Walk around the classroom and place chocolate pudding in each student's cup. During their wait or once they have received their chocolate pudding, they should add the layer to their charts and draw the chocolate pudding in their cups.
7. *Who can tell me which horizon is on top of the A horizon?* The answer would be the O horizon, or organic material. *Who can tell me what everyday items would be a good representation for the organic material?* Answers may include anything that could "resemble" the organic material. *Today, we are going to use green coconut.* Walk around the classroom and sprinkle green coconut into each student's cup. During their wait or once they have received their green coconut, they should add the layer to their charts and draw the green coconut in their cups.
8. Next, you can walk around and add a gummy worm to each student's cup. *Why do we need worms in the soil?* Answers should include aeration, nutrition, etc. Discuss how organisms in the soil help to benefit the overall soil composition and can help with plant growth.
9. Once students finish their charts and pictures, have students answer the questions on the final page. At this time, students can consume their soil profiles. While they finish working, play the following song in the background: <https://youtu.be/gx2wVHeiTKF>.
10. Have students clean up and turn in their activity sheets.

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Key — Appendix 3: Soil

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Part 1

DIRECTIONS:

Read "Ag 101: Soil Horizons" in the summer issue of *FFA New Horizons* and complete the following activities.

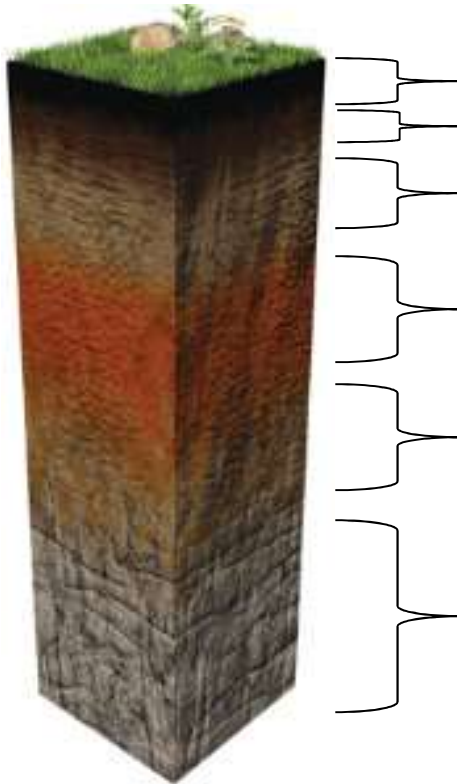
	Letter	Horizon Name	Short, one- to five-word description
	<u>O</u>	<u>Organic Material</u>	<u>Answer will vary.</u>
	<u>A</u>	<u>Topsoil</u>	<u>Answers will vary.</u>
	<u>E</u>	<u>Eluviated</u>	<u>Answers will vary.</u>
	<u>B</u>	<u>Subsoil</u>	<u>Answers will vary.</u>
	<u>C</u>	<u>Parent Material</u>	<u>Answers will vary.</u>
	<u>R</u>	<u>Bedrock</u>	<u>Answers will vary.</u>

Image from [Soils4Kids](#) from the Soil Science Society of America.

Why is it important to understand soil?

Soil is important for many reasons. Soil is the foundation for our homes and roads, grows plants/crops, etc. By understanding soil, we can have a greater appreciation of agricultural production practices, understand where homes should and should not be built, etc. Answers will vary.



Identify two ways soil has impacted you today. **Answers will vary.**

1. _____
2. _____

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Part 2

DIRECTIONS:

While thinking about each basic horizon of a soil profile, you are going to create your own soil profile using everyday items that could represent each horizon.

1. Select a category of everyday item you would like to use. (Example: candy)
2. Draw a soil profile and use different items from that category to develop each layer of the profile. (Example: Oreo cookies for bedrock) Be sure to select items from your category that match the color, look and texture of the actual soil profile horizons.
3. Label each horizon with the representative letter and name. (Example: O layer = organic material)

Category Selected:
Answers will vary.

Letter: O

Name:
Organic Material

Images will vary.

Letter: A

Name:
Topsoil

Images will vary.

Letter: E

Name:
Eluviated

Images will vary.

Letter: B

Name:
Subsoil

Images will vary.

Letter: C

Name:
Parent Material

Images will vary.

Letter: R

Name:
Bedrock

Images will vary.

NAME: _____

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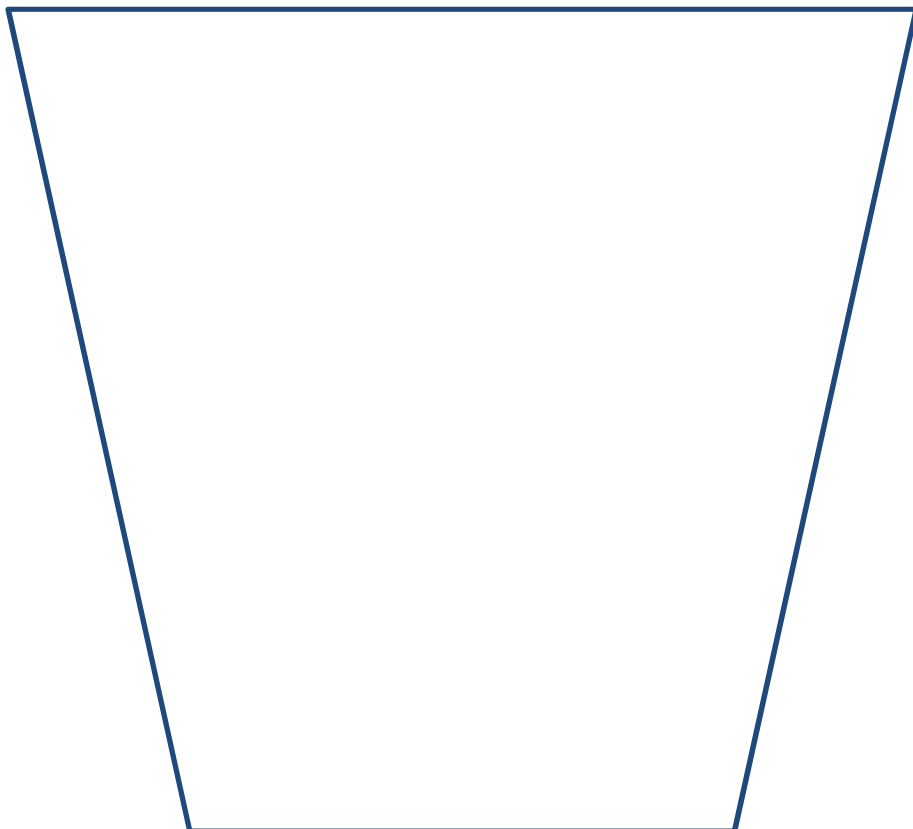
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Horizon Letter and Name	Represented by	Description of Appearance
O, Organic Material	Green coconut or sprinkles	Answers will vary.
A, Topsoil	Chocolate pudding	Answers will vary.
E, Eluviated		Answers will vary.
B, Subsoil	Vanilla pudding	Answers will vary.
C, Parent Material	Crushed vanilla wafers	Answers will vary.
R, Bedrock	Oreos	Answers will vary.

Your Soil Profile Cup

Images will vary. All labels should be the same as the first column above.



NAME: _____

1. Which horizon of the soil would be the richest in nutrients for plant growth?

O, organic material

Why? The layer is formed over hundreds of years from dead and decaying matter which lends itself to be high in essential nutrition for plant growth.



2. Which horizon of the soil do we test for the texture in a soil judging competition?

Horizon A



3. The E horizon is not always represented in all soil profiles. In what type of site would an E horizon be found?

- a. High temporary water table
- b. Forest soils

4. Which horizon is known as the zone of accumulation?

Horizon B

Why? It's named the zone of accumulation due to the build-up of minerals leached out of the A and E horizons.

5. What is the leaching process in horizon B called?

Illuviation



6. Which layer is most likely to be caused by disturbance from plants or animals?

Horizon A

Why? This layer is close to the top of soil profiles.

8. What is the deepest horizon in the soil pit before the bedrock?

Horizon C



8. The bedrock layer is commonly made up of what materials?

- a. Sandstone
- b. Granite
- c. Limestone

9. Using AgExplorer.FFA.org, identify 3 careers in which having background knowledge in soil science would be extremely important. Answers will vary.

- a. _____
- b. _____
- c. _____

NAME: _____

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Part 4

DIRECTIONS:

Now let's find out what the soil profile looks like in your area. Using the following resource from UC Davis, <https://casoilresource.lawr.ucdavis.edu/gmap/>, find your home and school on the map by using the "menu" button in the top left corner. Once you have found these two points on the map, answer the following questions using the content in the left side bar. NOTE: You must click on a specific spot and drop a red dot to have specific information populate in the side bar.

Home

1. Click on "map composition." What types of soils are present? **Answers will vary.**
2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located? **Answers will vary.**
3. Select one of the soil types present and identify the taxonomic order. **Answers will vary.**

4. Draw the soil profile.
Answers will vary.

School

1. Click on "map composition." What types of soils are present? **Answers will vary.**
2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located? **Answers will vary.**
3. Select one of the soil types present and identify the taxonomic order. **Answers will vary.**

4. Draw the soil profile.
Answers will vary.

How can understanding the soil in your local area help you in the future? **Understanding soil can help you in your future career, home ownership, gardening, etc.**