

Edible Soils Lab

Different Soil Horizons

Though the soil composition varies from place to place, most soils conform to a general pattern consisting of six horizons. A vertical cross section of the soil, which is known as the soil profile, is your best bet if you intend to get well-versed with different horizons.

Purpose: What is the makeup of a soil horizon (profile)?

Hypothesis: If I use the appropriate ingredients in the correct order, then I will construct an accurate representation of the soil horizon (profile).

Directions: Please create your edible soil profile following the instructions below. Then answer the questions using the passages provided from the Different Soil Horizons article found <http://www.buzzle.com/articles/soil-horizon-layers.html> **Once you have completed your lab you may enjoy your horizon.**

Experiment: Construct an edible soil profile as follows.

R Horizon (Bedrock)

The R horizon is basically the deepest soil horizon in the soil profile. Unlike the horizon above, this horizon does not comprise rocks or boulders, but instead is made of continuous mass of bedrock. It is very difficult to dig through this layer. In some regions, the bedrock is located just a few inches below the surface, and in some, it is found several feet below

Step 1 Horizon R: In a plastic cup, place Oreo cookie in the bottom of the cup. Answer the following questions.

1A. Horizon R is the deepest soil in the soil profile and is made of a mass of bedrock. How does the Oreo represent Horizon R?

1B. If you were designing this activity what is another food related item you could use to represent bedrock?

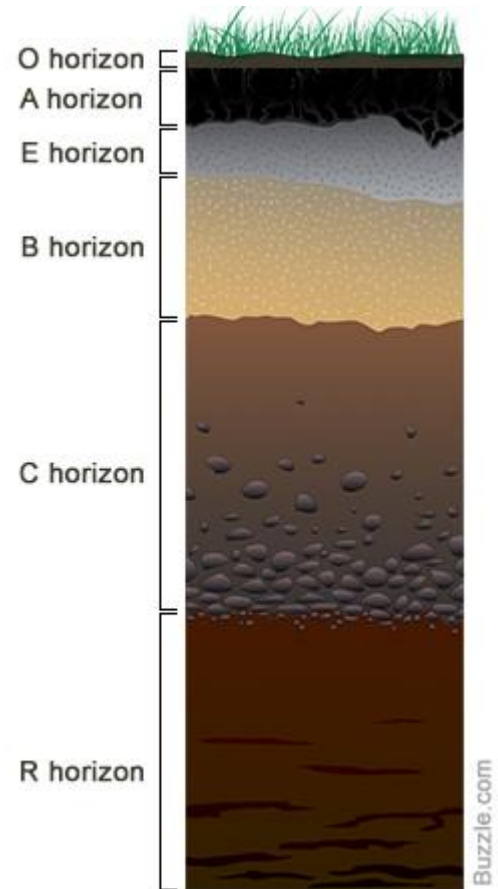
The C Horizon

“The C horizon is mainly made of large rocks or lumps of partially broken bedrock. It is considered the transition layer between soil and parent material. This layer is least affected by weathering as it lies deep within the soil and is inaccessible to the soil-forming agents. That explains why the rocks in this layer haven't changed much since their origin. As plant roots do not reach this layer, the C horizon is typically devoid of organic matter.” – Buzzle

Step 2: Place a small layer of chocolate chips on top of the Oreo cookie. Answer the following questions.

2A. How do the crumbled Oreos represent horizon C?

2B. What influences does the parent material have on the other horizons? Discuss how this is like our parents influences on us as humans.



2C. According to the passage above plant roots do not reach layer c, please describe your thoughts on what limits root growth.

The B Horizon (Subsoil)

The B horizon is rich in clay and minerals like iron or aluminum. It is usually reddish or brown in color, which can be attributed to the presence of the iron oxide and clay. Though this layer has a high mineral content as compared to the topsoil, the chances of some organic matter reaching this layer as a result of the leaching process cannot be ruled out.

Plant roots may reach this layer, but the chances of this are pretty less, and therefore, its humus content is very low.

Step 3: Place a layer of vanilla pudding on top of the chocolate chips

3A. Horizon B is also known as _____.

3B. Horizon B is lighter in color than the A or O horizons. According to what you know about soil and the passage above why is that?

3C. Using the passage above the reddish brown colors can be attributed to the presence of what?

3D. Using what you know about horizon B why did we use vanilla pudding to represent this layer?

A Horizon (Topsoil)

The A horizon is the topmost layer of the mineral soil. As it lies just below the O horizon, this layer also has some amount of humus in it and therefore, it is darker than the layers below. Similarly, the soil particles in this zone are smaller and finer compared to the lower horizons of the soil. It is this layer where seeds germinate and roots grow.

Even the soil organisms, like earthworms, fungi, and bacteria, are mainly concentrated in this layer. As most of the biological activities take place in this layer, it is often referred to as the 'biomantle'.

Step 4 Horizon A: Place a layer of chocolate pudding on top of the vanilla pudding and add ONE gummy worm

4A. Horizon A is also known as _____.

This is the top layer of soil. Nutrients, bacteria, fungi, and small animals are abundant. Plants thrive in it because of the nutrients in it.

4B. According to the passage above what happens in this layer in regards to seeds and roots?

4C. You were instructed to add a gummy worm to your A horizon, why is this a key part of horizon A?

4D. Using what you now about horizon A why did we use chocolate pudding to represent this layer?

4E. Using the article above please define the term “Biomantle”

O Horizon

The letter 'O' stands for organic, which implies that this horizon is rich in humus, i.e., the organic matter of plant and animal origin. This organic matter, which is usually in various stages of decomposition, gives this horizon its characteristic dark color. In order to be identified as the O horizon, the layer has to have more than 20-30 percent organic matter. Furthermore, depending on whether the origin of the decomposed matter is visible to the naked eye or not, the layer is divided into two zones - O1 and O2

Step 5 Horizon O: Place a layer of chocolate chips on top.

5A. What does the Letter O stand for?

5B. According to the article what percent of organic matter can be found in this layer?

5C. Synthesize what you know about plants to answer this question: What impact does decomposed matter have to plants? Why is this the MOST IMPORTANT layer or soil?

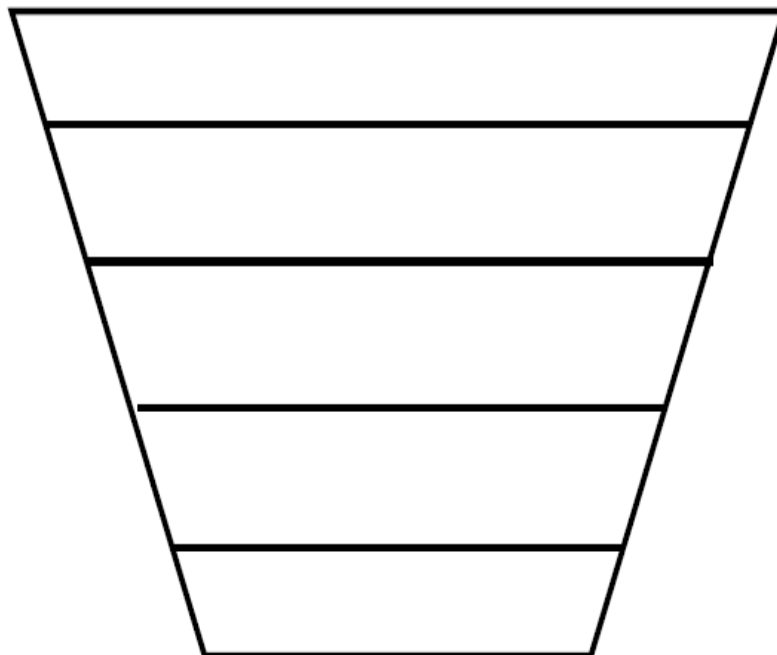
Step 6: DO NOT EAT UNTIL GIVEN PERMISSION TO. You MUST draw your diagram and answer ALL questions above first!

Analysis and Conclusion:

1. Using the space provided (Under each heading) below please indicate
 - a. FIRST: The soil layer or part example: A, B
 - b. SECOND: The Edible representation example: Oreo

Soil layer or part

Edible representation



2. Discuss the use of (Why did we use these materials to represent each layer?)

Material	Horizon	Why?
Chocolate Pudding		
Vanilla Pudding		
Oreo		
Gummy Worms		
Chocolate Chips		