

Warm-Up

Write the question and the examples:

1. Tell me whether each of these is an example of chemical weathering, mechanical weathering or both:
 - a) A rock getting hit by sand carried in the wind
 - b) A weed growing through a crack in the sidewalk
 - c) Polluted rain falling on Stone Mountain
 - d) A kid leaves his bike out in the rain and it gets a rusty chain.

Get the Dirt on Soil



What is Soil?

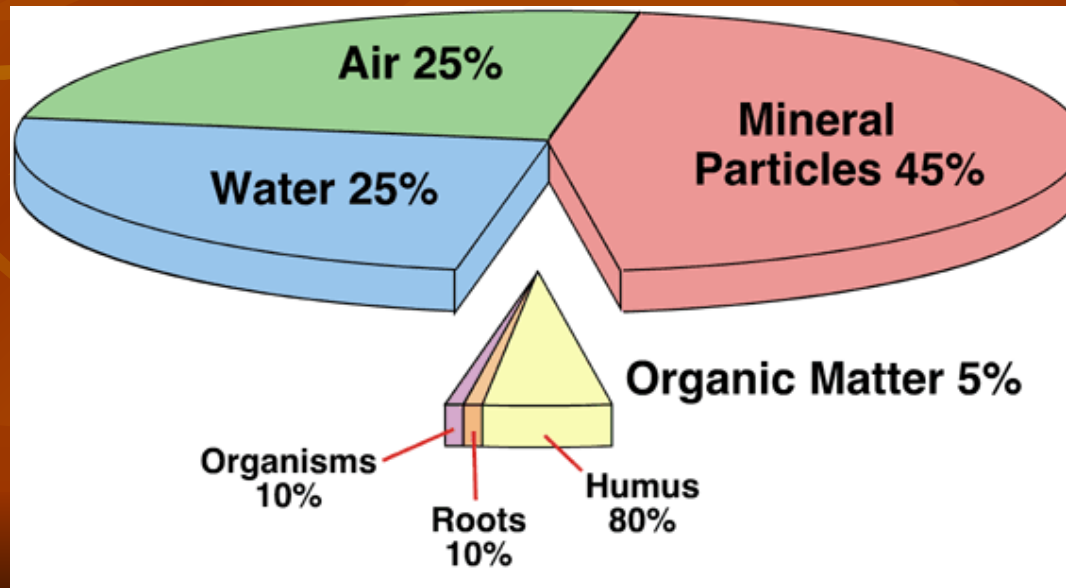
- Soil forms as rock is weathered and mixes with other materials on the surface



What is soil made out of?

■ Soil composition:

- A mixture of rock particles, minerals, decayed organic material, air, and water.
- Humus is a dark-colored substance that forms as plant and animal remains decay
- Humus is rich in nutrients plants need to grow

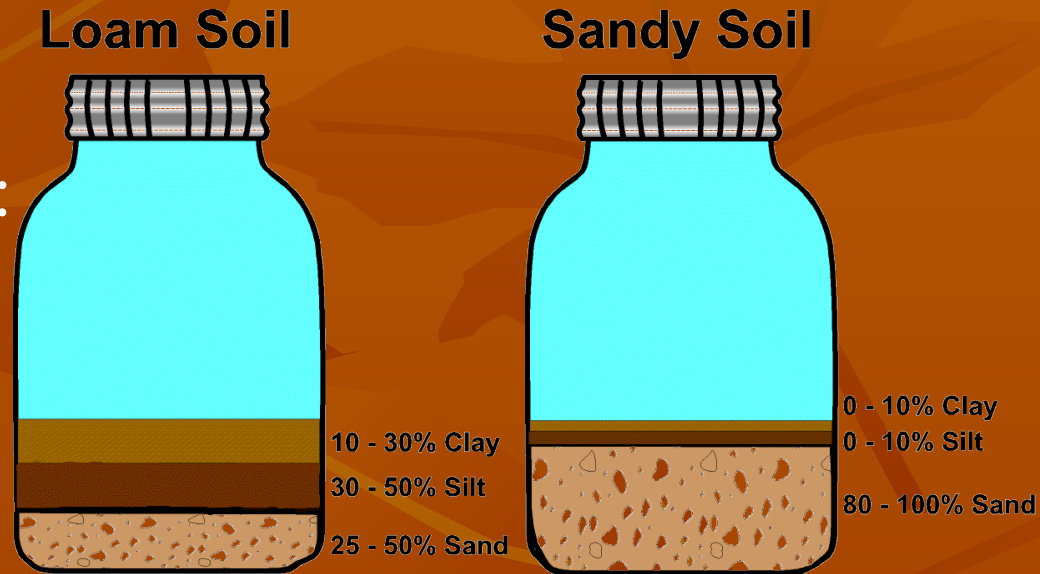


Soil Texture

- From largest to smallest:

- Gravel
- Sand
- Silt
- Clay

- If texture is too dense or not dense enough plants may not survive
- Loam is made up of about equal parts of clay, sand, and silt.
 - *Best for growing plants*



Horizons

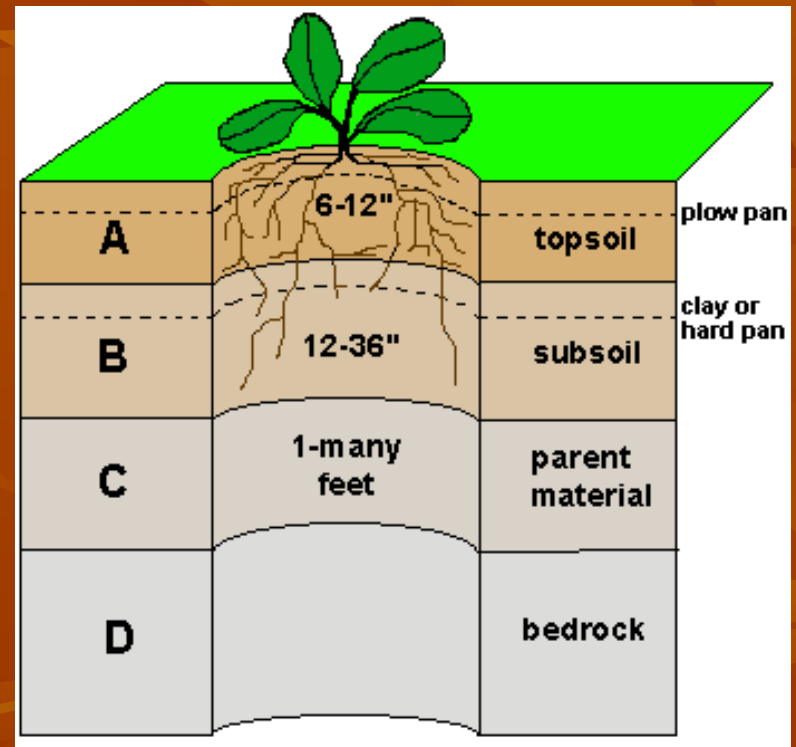
■ A soil horizon is a layer of soil that differs in color and texture from the layers above or below it

■ Horizon A (topsoil)

■ Horizon B (subsoil)

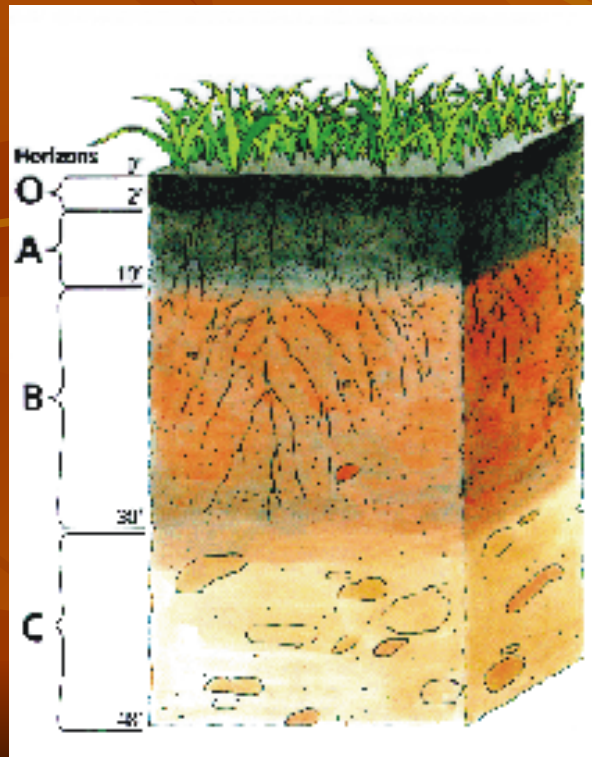
■ Horizon C

■ Bedrock



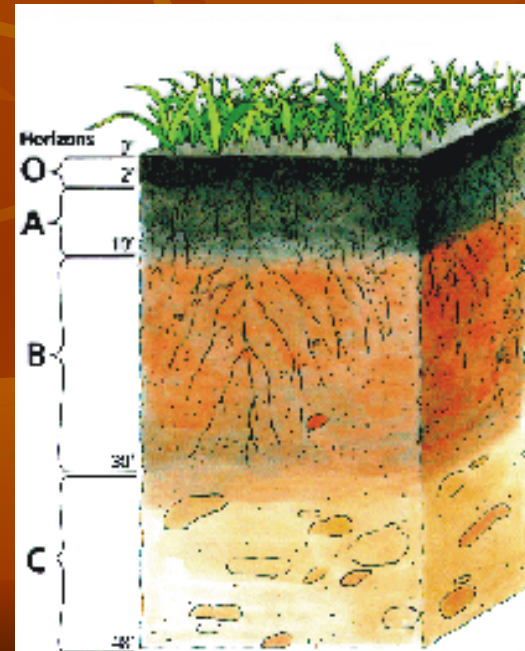
Horizon A

- Topsoil: a crumbly, dark brown soil that is a mixture of humus, clay, and other minerals
- This is what you walk on outside



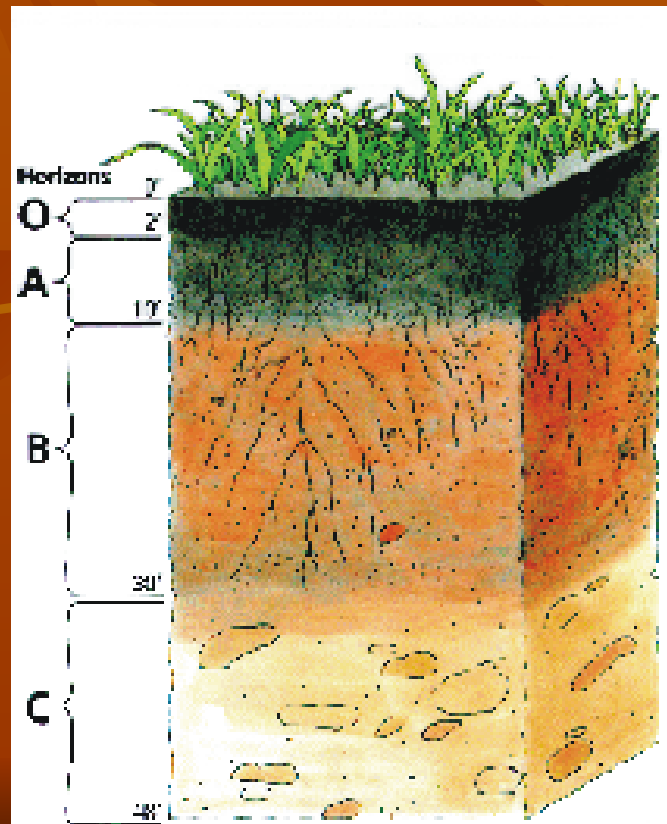
Horizon B

- Subsoil: usually consists of clay and other particles washed down from the A horizon, but contains little humus
- Below the topsoil. The subsoil is a little lighter in color than the topsoil

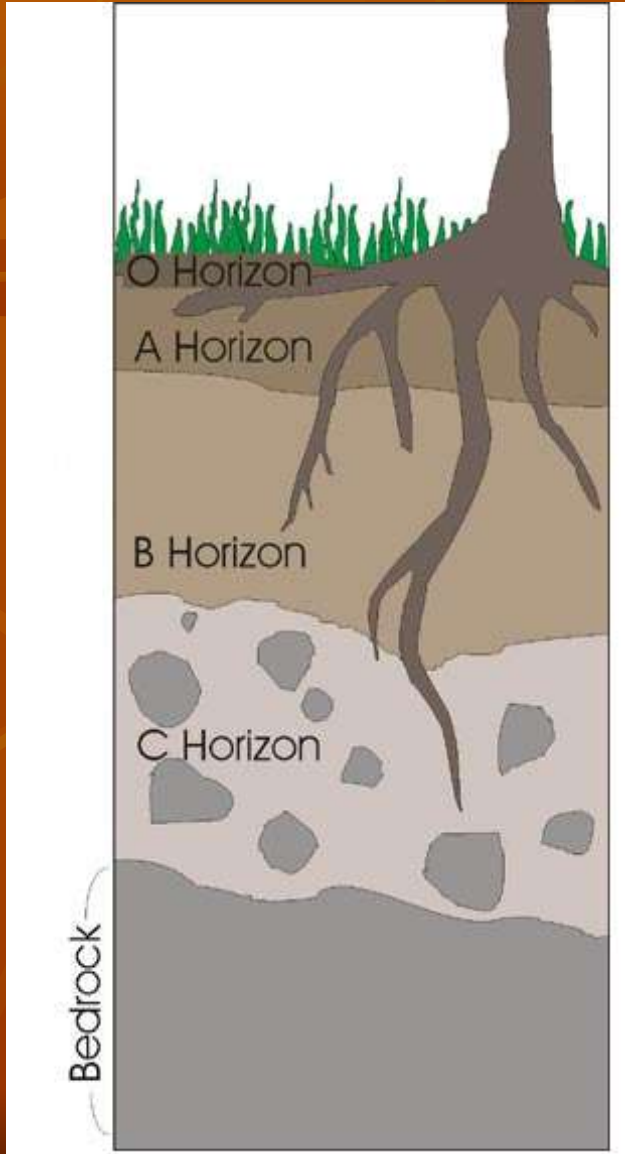


Horizon C

- Contains only partly weathered rock
- This is where you will see bigger rocks and less soil



Bedrock



- Bedrock is the solid layer of rock beneath the soil
- Once the bedrock gets to the top, it becomes weathered and turns into topsoil

How fast is soil made?

- Soil develops the quickest in areas with a warm and rainy climate
- Areas with limestone weather quicker than areas with granite



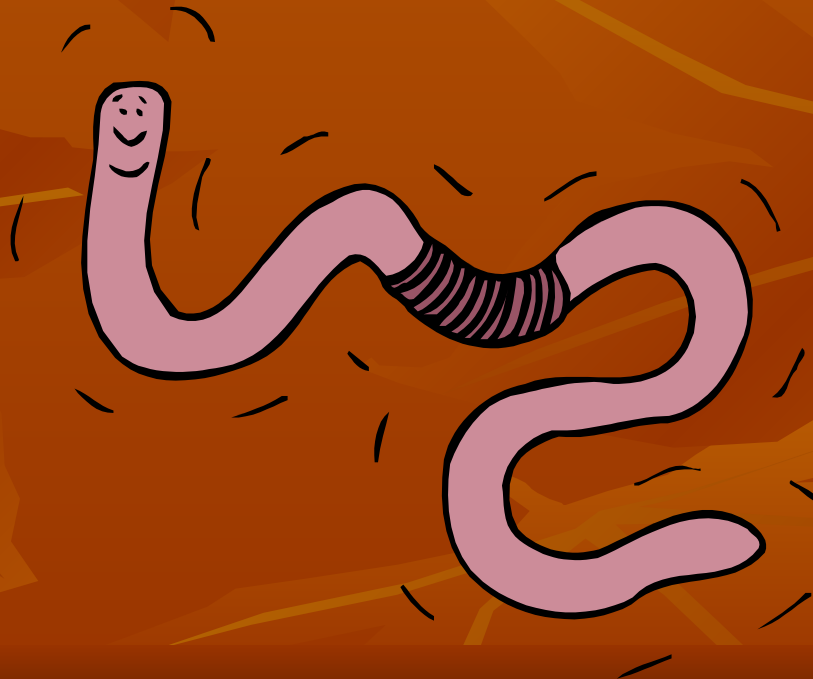
What else is down there?

- Plants contribute the most to humus
- Decomposers are the organisms that break the remains of dead organisms into smaller pieces and eat them with chemicals!!!
 - Fungi (mushrooms and molds)
 - Bacteria
 - Earthworms



Earthworms

- Nature's mixers
- Earthworm poop is rich in substances plants need to grow



How do they help?

- Many burrowing animals (mice, moles, prairie dogs and gophers) break up hard, compacted soil and mix humus through it
- These earthworms and animals help to mix air into the soil. Plants need this oxygen to survive.



Ground level

Topsoil

Subsoil

Weathered
Parent
Material

Bedrock

Review Questions

1. What is soil?
2. What is humus and how is it helpful?
3. What are the different soil horizons?
4. Put these in order from top to bottom:
Subsoil bedrock Topsoil
5. How do earthworms and animals help the soil?

Conserving Land and Soil



Land Use

■ Three things that change the land

1. Agriculture
2. Development
3. Mining



Agriculture

- This is an important land use.
- New farmland must be created by clearing forests, draining wetland, and irrigating (watering) deserts.
- Also have pastures for grazing cattle.



Development

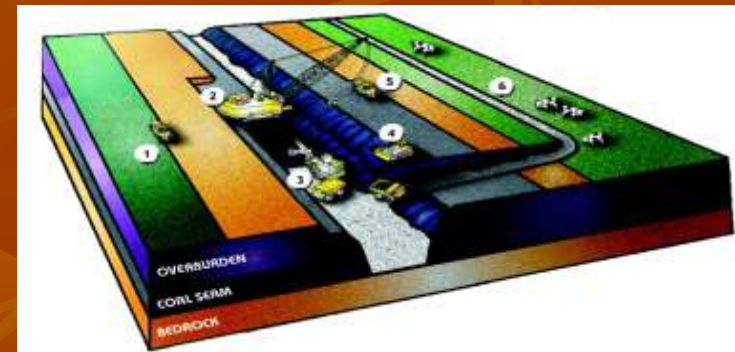
- The construction of homes, stores, office buildings, roads, bridges, and other structures.



Mining

■ Strip Mining causes the top layer of land to be stripped away.

- Trees are bulldozed down.
- Holes are drilled through rock.
- Explosives break up rock.
- This waste is piled up on the strip next to it in order to start another strip.
- It leaves no trees or plants to prevent erosion.
- Miners must reclaim the land (prevent erosion) by replanting trees and grass.



Value of Soil

- Soil is one of Earth's most valuable resources because everything that lives depends on it.

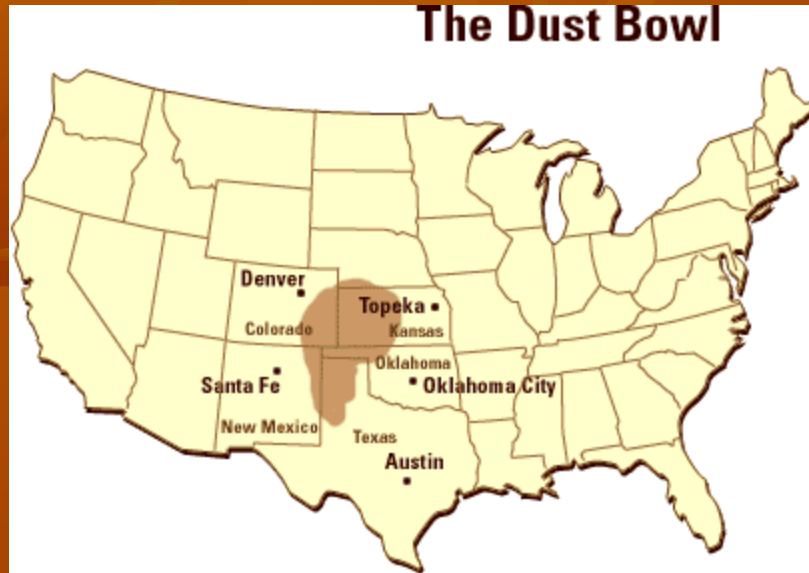


Soil Damage and Loss

- Desertification- Where a land that is fertile turns into desertlike conditions
- Happens during drought.



Dust Bowl



Dust Bowl

- In the 1930s, too many plants were removed from the land.
- This caused the soil to erode away.



Soil Conservation

- Soil Conservation - The management of soil to prevent its destruction.



Ways to Conserve

- Ways that soil can be conserved include :
 - contour plowing
 - conservation plowing
 - leaving the soil to lie fallow (unplanted with crops)
 - crop rotation.
- Pg. 233.



Strip Cropping

- Farmers alternate strips of tall crops (corn)
with strips of short crops (squash)
- Short crops prevent soil from washing out from tall crops which are less protected



Contour Plowing

- During the 1930s wind erosion destroyed the land.
- To prevent this from happening again, farmers began to plow the land according to its shape rather than just up and down like they had in the past.
- It forms ridges to keep water and topsoil from flowing away.
- It slows water flow and saves topsoil.



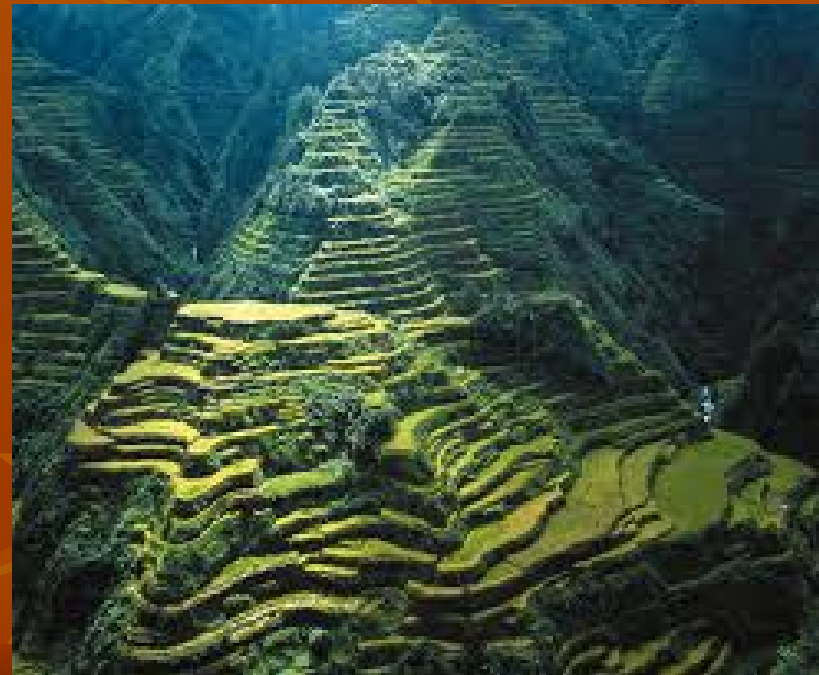
Conservation Plowing

- Instead of plowing fields and leaving them exposed farmers will use machines that break up only the subsoil
- The weeds left will help keep the topsoil from blowing away



Terracing

- Steep hillsides are built into a series of flat terraces
- Slows runoff and catches eroding soil



Windbreaks

- Rows of trees or shrubs planted along the edges of fields
- Block wind and trap eroding soil
- Sometimes can be a fence (construction sites)



Leaving land fallow

- Leaving land unplanted with crops
- Restores the fertility of soil



Crop Rotation

- A farmer plants different crops in a field each year
- Some crops use less nutrients than others
- Certain crops, such as peanuts, add nutrients to the soil

