

It's not DIRT!

6th Grade Science
Mrs. Hochmuth



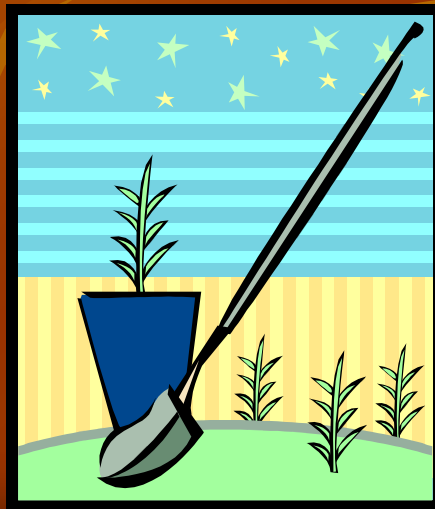
What are we going to learn...

- Soil-Why is it important?
- What is soil?
- Sand, Silt and Clay
- What's a soil profile?
- Horizons?
- Not all soil is brown
- Running out of dirt!



So what is Soil?

Soil is a mixture of rock and mineral particles and organic matter. Soil covers the earth in a thin layer and it is very important in plant growth.



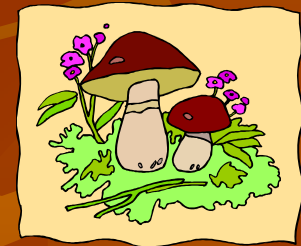
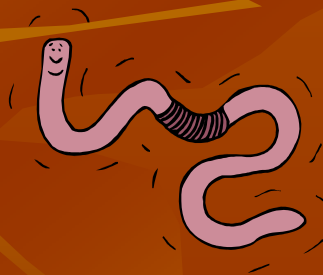
Why should I care about soil?

- Soil is the #1 support for plants
- Soil anchors the plants roots so that they don't fall over
- Soil is a superstore of nutrients
- For a plant to grow it needs 16 elements! (13 come from the soil!)
- Moisture for the plants is stored in the soil

What exactly is in soil?

Soil is made up of mineral matter that has been broken down by chemical, physical and biological actions.

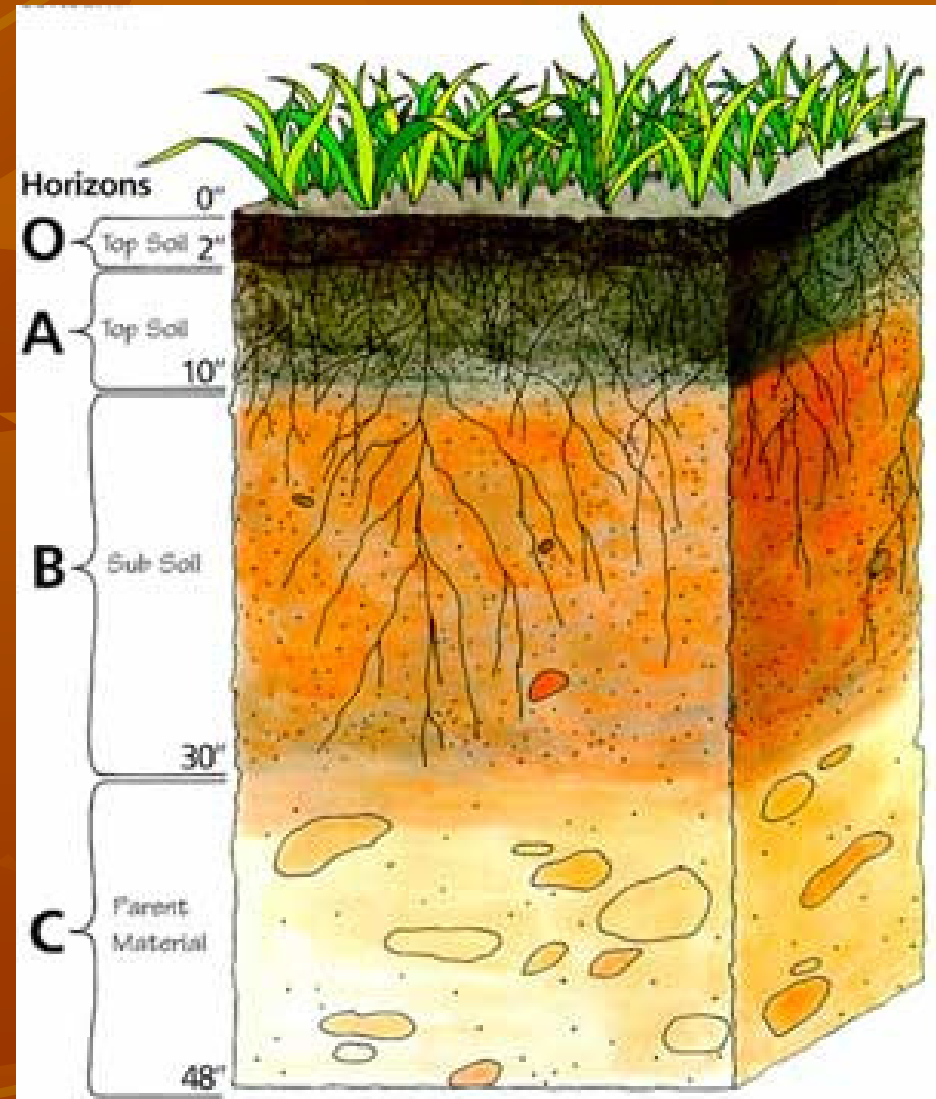
There are also living things in soil such as bacteria, fungi, mold, worms and insects.



The more living things the more productive the soil!

Soil Formation and Profile

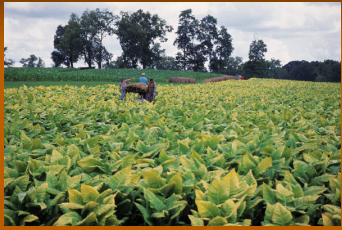
- A soil profile is a vertical cross section through a soil.
- It is made up of layers of soil material.
- These layers are called horizons. Horizons differ from each other in color, texture and/or structure
- Decayed material in soil is called **humus**.



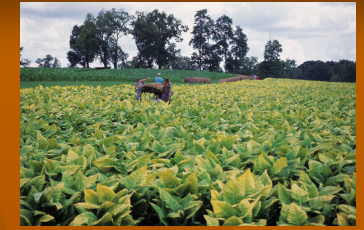
Parent Material

(Yes soils kind of have a Mom and Dad!)

- **Parent material is the unweathered material from what soil is formed. This is the hard rock found under the soil.**
- **The parent material has a strong effect on the properties of young soils**
- **If the parent material has lots of organic matter then the soil will be more acidic**
- **If the parent material is high in limestone then the soil will be more basic**



Horizons



“A” Horizon- This is the top part of the soil where life is most active. It is the most productive horizon because it has such a high organic matter and granular soil structure

“B” Horizon- Lies below the A horizon and is called the subsoil

“C” Horizon- Parent material horizon mostly composed of rock

The A horizon: Topsoil

- Can be a few inches to a foot deep
- Is usually a pretty dark color
- Lighter texture than the B or C horizon
- More likely to be a granular structure



The B horizon: Subsoil

- Low in organic matter
- Red or yellow in color
- Less desirable structure than the A horizon
- Blocky or prismatic structure
- Roots may extend into this horizon looking for moisture and nutrients



The C horizon: Parent Rock

- Deepest of the 3 major horizons
- Low in organic matter
- Coarse or rocky texture
- Undesirable structure
- Lighter in color than A and B horizon
- Rarely has roots or biological activity

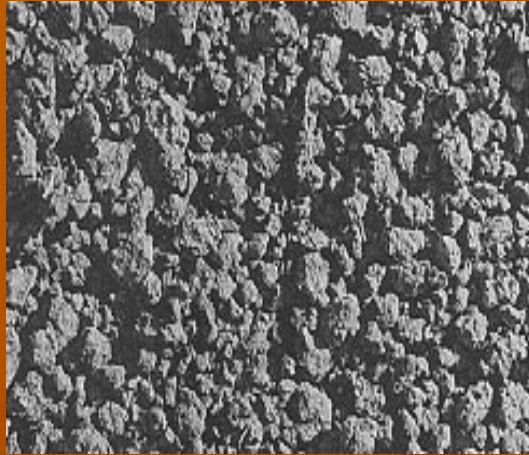


Texture, Structure, Depth and Color

- **Texture-** How much sand, silt and clay is found in soil, is it fine or coarse
- **Structure-** The mixture of the soil, how the particles are arranged to make up the soil, the structure is not permanent! Think of it as...wet soil, or disking the soil
- **Depth-** Important to plants, depends on rooting zone
- **Color-** Soil color can tell us a lot...It can tell us about drainage and water and organic matter

Soil and its Structures

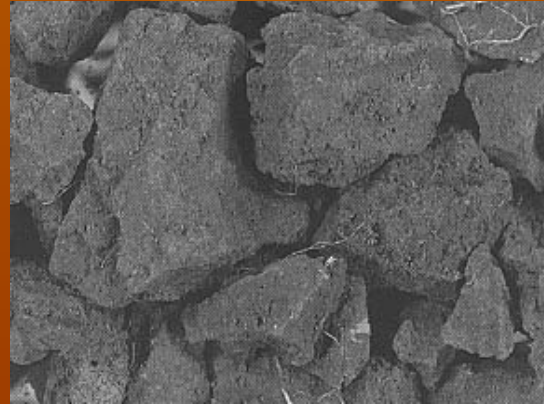
Granular



Platy



Blocky



Columnar



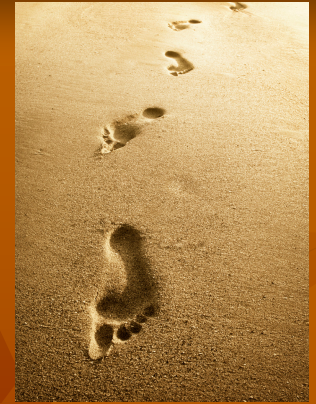
Prismatic





SAND

(Think of the beach!)



Sand is small, coarse-grained pieces of rock.

- We can see and feel the individual pieces
- It feels gritty. It doesn't stick together or form clods.
- It can be really fine or not so fine
- Not much surface area is exposed
- Sand increases space between particles, which means air and water can move more freely, which means Sand is needed in soil to provide good drainage!



SILT



(Think of flour!)

Silt is really soft and powdery

- Silt particles are so small that we can only see them with a microscope
- Water soaks well into silt
- Silt forms clods that crumble when wet so they are not good for mudballs!
- Silt particles don't stick together well
- Soils with a good water holding capacity are high in silt

CLAY

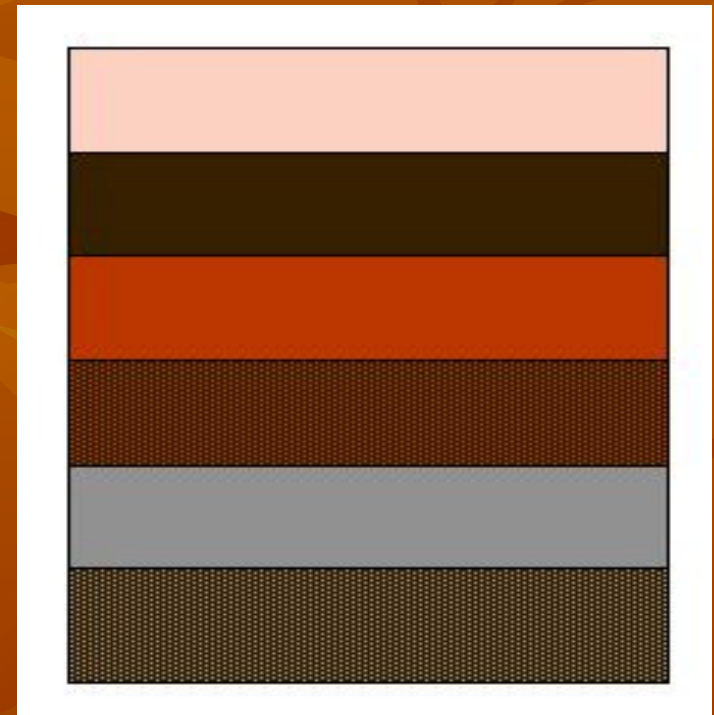


Clay is even finer than silt

- Clay particles are platy and thin in shape, they fit closely together with little space
- Clay sticks together well and forms hard clods
- A soil that contains lots of clay is considered “heavy”
- Clay has a large surface area because they are so small
- The amount of clay in a soil has a great impact on the soils water holding capacity

Soil and its Color

- Organic matter has a dark color:
humus
- A gray or motley color indicated
poor drainage
- Yellow or red color indicates iron and
good drainage



**Different Soil
Colors**



Soil Profile and Crop Production



- If we know the soil profile then we can determine the vertical distance plant roots, water and air penetration
- If the profile shows a shallow soil then we know to plant a crop with shallow roots
- The profile also tells us about the soils water holding capacity



Soil Testing



Soil Testing is the process of testing the soil by adding various chemicals to a soil to determine the nutrients in the soil



We test soil to determine what fertilizers should be used and also to determine what crops will grow best in that particular soil

Erosion and Soil Conservation

Erosion is when soil is moved by water or wind

- Water Erosion- Erosion from water is caused by raindrops and water flows. Water erosion removes the finer particles and organic matter first. Water erosion destroys the production of land very quickly.
- Wind Erosion- Happens in dry areas. The wind catches the particles and blows them away



Results of Erosion

- Losing the top soil
- Lower crop yields
- Use of more plant and commercial fertilizers
- Lower nutrient crops
- Formation of gullies
- Increased flood hazard
- Higher costs
- Silting of water holding bodies





Reducing Erosion



- Plant and cultivate crops according to the contour of the land
- Strip Cropping
- Terracing
- Crop Rotation
- Build ponds/dams

