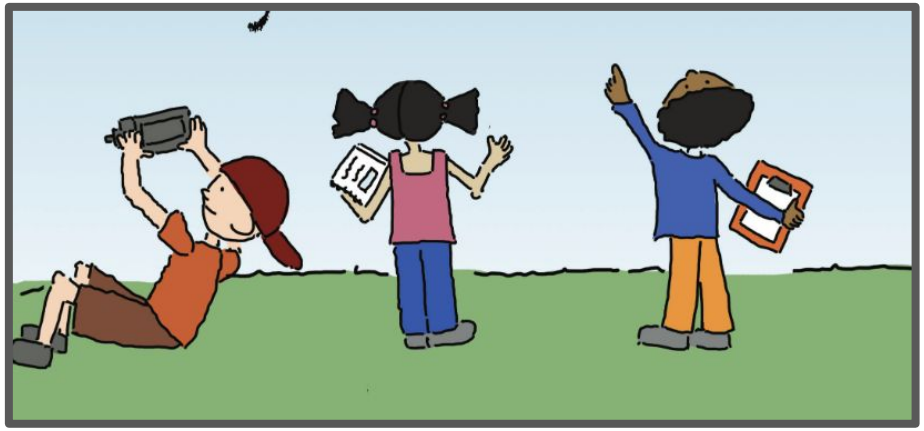
My FAVORITE Activity:

Draw or write your favorite festival activity. Why did you like this activity better than the rest?

Air, Water, and Soil Festival Field Journal

Waterville Primary

May 29, 2025



NAME: _____

Hosted by Waterville Primary, Xcite Learning, uToledo GME, Lucas County Soil and Water, The Toledo Zoo & Aquarium.
Created by j.haney, 2025

Weather Station: Air Temperature, Soil Temperature, Clouds, and Precipitation

Directions:

1. Go to the WEATHER STATION (white box on a post in prairie) and use the thermometer in the box to record the CURRENT air and soil temperature. Record below.
2. Look at the rain gauge and record how much total precipitation rain we received this MONTH. Record below.
3. Use a NASA Sky Viewer to observe the sky. Look for cloud types and cover, sky color, and sky visibility. Check off what you see.

Air Temperature: _____ºC

Soil Temperature: _____ºC

Precipitation (rain): _____ mm

Badge Earned!

Our Cloud Type Name: check one ✓

- ❑ Cirrus
- ❑ Cirrostratus
- ❑ Altocummulus
- ❑ Stratocumulus
- ❑ Nimbocumulus
- ❑ Fog
- ❑ Cirrocumulus
- ❑ Altostratus
- ❑ Stratus
- ❑ Cumulus
- ❑ Nimbostratus

Cloud Cover

- ❑ Few (<10%)
- ❑ Isolated (10 -25%)
- ❑ Scattered (25 - 50%)
- ❑ Broken (50 - 90%)
- ❑ Overcast (>90%)

Sky Color [look up]

- ❑ Deep Blue
- ❑ Blue
- ❑ Light Blue
- ❑ Pale Blue
- ❑ Milky

Sky Visibility [look across]

- ❑ Unusually Clear
- ❑ Clear
- ❑ Somewhat Hazy
- ❑ Very Hazy
- ❑ Extremely Hazy

NOTE: Teachers can enter this data as cloud observation in the GLOBE Observer App ;-)

Cloudscapes Mural

Directions:

1. Working in PAIRS, pick a cloud name from the jar.
2. Research this type of cloud using a NASA Sky Viewer and the GLOBE Cloud Book (find the page for your cloud type). RECORD the name of your cloud, where you find it in the sky, and a few words to describe the cloud type.
3. Using the materials available, make a cloud and stick it to the blue cloud mural. Also stick the cloud name label next to your cloud. BE SURE TO PUT IT IN THE CORRECT PLACE (High, Middle, Low clouds).

Badge Earned!

Our Cloud Type Name: check one ✓

- ❑ Cirrus
- ❑ Cirrocumulus
- ❑ Cirrostratus
- ❑ Altostratus
- ❑ Altocummulus
- ❑ Stratus
- ❑ Stratocumulus
- ❑ Cumulus
- ❑ Nimbocumulus
- ❑ Nimbostratus

Where in the sky is this cloud type found?

- ❑ High
- ❑ Middle
- ❑ Low

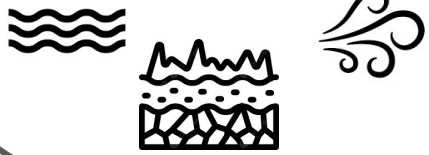
One word [or drawing] to describe our cloud:

Earth as a System Terrariums

Directions:

1. Take one CLEAN water bottle and finish cutting it in half using scissors.
2. Make “wings” in the top half of the bottle.
3. Put 1 “cup” of soil in the bottom half of the bottle.
4. Add a pinch of WHEATGRASS seeds (10 -20 seeds) to the soil. Using an unsharpened pencil push the seeds into the soil just a very little bit to cover them with soil.
5. Gently add a small “container” of water over the seeds.
6. Put the top on using the WINGS to help hold in place.
7. Ask for help in taping your top onto the bottom.
8. Add a ribbon.
9. Take home and place in a warm sunny place. Watch your system grow!
10. At home, draw your system on the first day of summer vacation! Measure and record how tall the grass is growing inside.
11. You can take the top off and CUT THE GRASS if you want! Or you can leave the top on and see how the system works.

AIR, WATER, and SOIL working together to support LIFE!



Badge Earned!

Draw what you see in this terrarium.

Date of observation: _____

Height of plants: _____ cm

Soil Profile Models

Directions : A soil profile shows you what the soil looks like underground. Soil layers itself and each layer looks different. Look at the soil profile that came out of the ground. Put a piece of sticky tape on the rectangle on your page below. Take a pinch of soil from each layer and put it on your tape in the same order as the soil profile. Now you have a model of the soil profile from your school prairie!
OPTIONAL: measure the depth of each layer starting at O cm.

Habitat: Our Prairie

Top of the soil
(0 cm)

Fun Fact: On average, it takes 200 years to make one inch of soil!

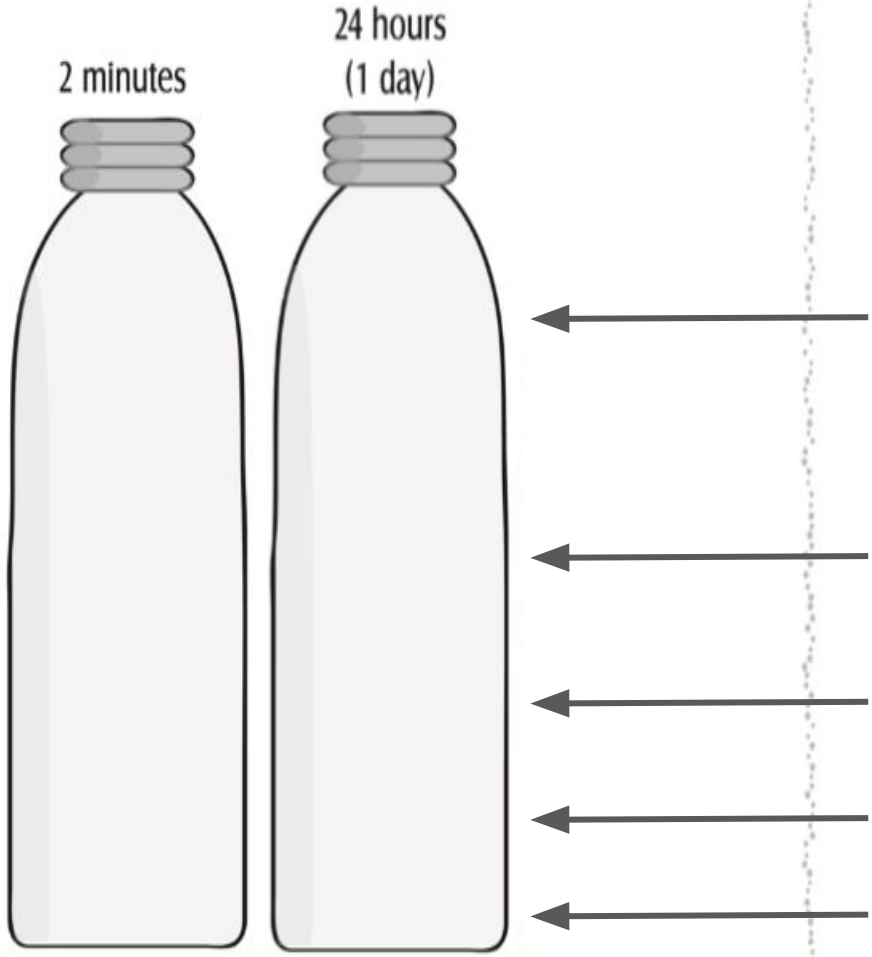
THINK: How is soil made? Where does it come from?

Badge Earned!

Directions : Add one inch (two side fingers) of soil to the vial. Fill the vial to the top with water, but leave ½ inch (one side finger) of air at the top. Shake hard for 10 seconds. Let the tube stand still. After a minute or two, draw what you see. Use color if possible. **After 1 day**, draw what you see and LABEL each arrow with what type of soil ends up on top, middle top, middle bottom, and bottom. Use these words (soil types):

Water Sand Clay Organic (humus) Silt

The soil in the jar looked like this after:



THINK: Why does it layer this way?

Soil Texture

Directions:

1. CHALLENGE: Using the soil sieves and one cup of dry soil, sort the soil onto plates based on soil particle size (smallest, medium, largest)? How many groups can you make?

OPTIONAL:

2. Take one small handful of wet soil and ask for help to wet it in your hands. Squeeze it into the shape of a snake.
3. Slowly squeeze/push the wet soil between your thumb and first finger.
   - If you CANNOT make a ribbon or snake and the soil feels very gritty/bumpy, you have a SANDY SOIL.
   - If you CAN make a ribbon or snake that is roughly 1 inch long or shorter, you have a SILTY SOIL.
   - If you CAN make a ribbon or snake that is longer than 1 inch and the ball feels sticky, you have a CLAY SOIL.
5. Clean your hands using the "Scientist" wipes!

Badge Earned!

I was able to sort the soil into: ✓

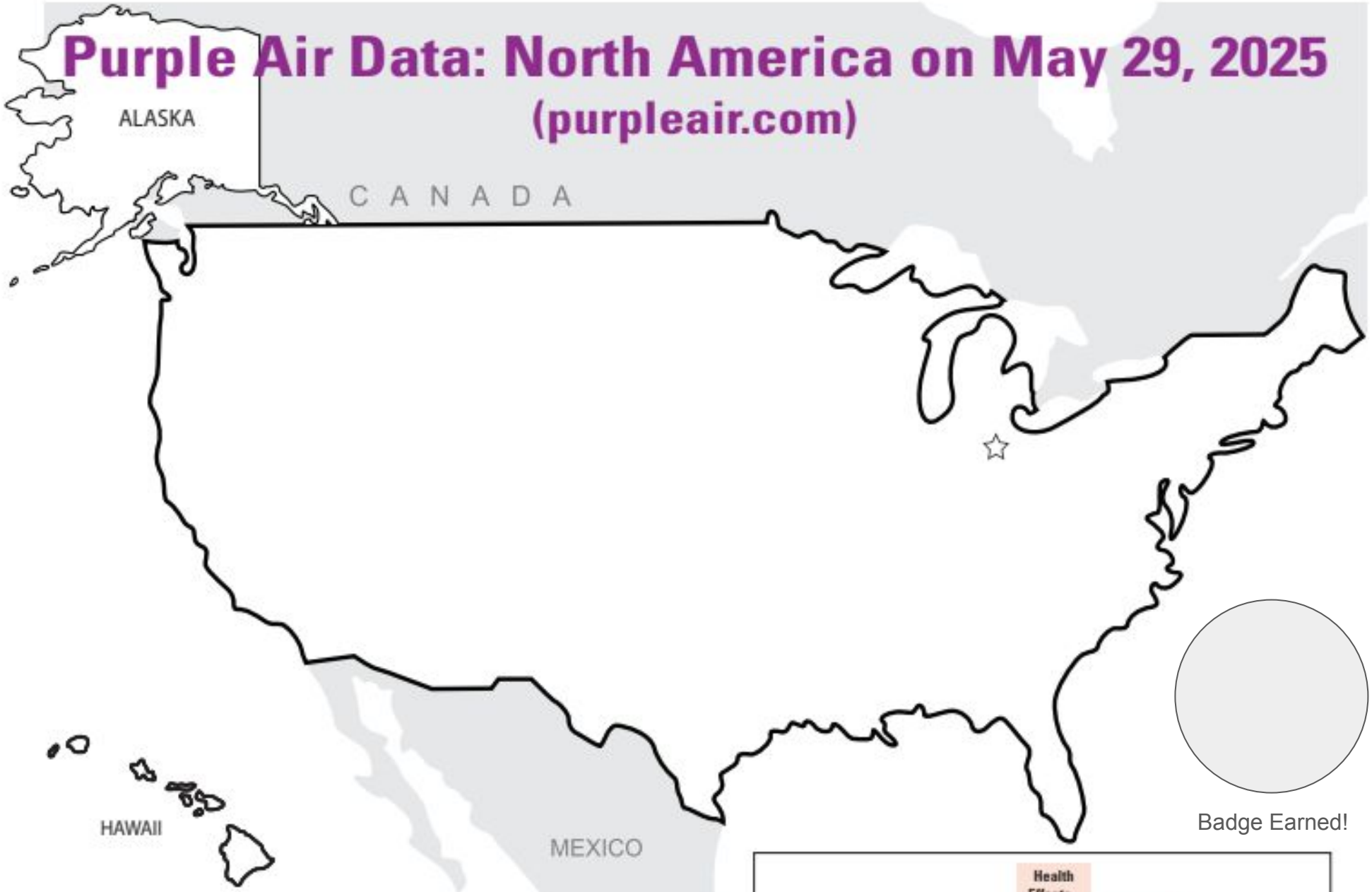
- ❑ One group
- ❑ Two groups
- ❑ Three groups
- ❑ Four groups

OPTIONAL: From the ribbon test, I found out that our soil is mostly:

- ❑ SANDY SOIL
- ❑ SILTY SOIL
- ❑ CLAY SOIL

Purple Air Data: North America on May 29, 2025

(purpleair.com)



Badge Earned!

Key: US EPA PM 2.5	Good	Acceptable	Health Effects - Sensitive Groups - 24 hours of exposure	Health Effects - General Public - 24 hours	Health Alert - 24 hours	Health warning - 24 hours
No Data	0	50	100	150	200	300

Directions: On an iPad, find the CURRENT purple air reading for Waterville Primary. Use a cotton swab and water color to DOT that color on the star location above. Then ZOOM out to see North America. Use other swabs and colors to DOT the rest of the map to make a model of the air quality today across North America.

Macroinvertebrates

[Mac-ro-in-ver-ta-brats]

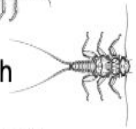
Directions: Draw a macroinvertebrate in the box below. Use a hand lens or microscope so that you can draw the details of what the animal looks like up close!

Badge Earned!

Macroinvertebrates

Record the number of each macroinvertebrate you find!

Group 1: Sensitive to Pollution

- ☐ Alderfly 
- ☐ Stonefly Nymph 
- ☐ Dobsonfly 

Group 2: Semi-sensitive to Pollution

- ☐ Caddisfly Larva 
- ☐ Crane Fly Larva 
- ☐ Crayfish 
- ☐ Clams and Mussels 
- ☐ Damselfly Nymph 
- ☐ Dragonfly Nymph 
- ☐ Mayfly Nymph 
- ☐ Riffle Beetle 
- ☐ Water Penny Larva 

Group 3: Semi-tolerant of Pollution ✓

- ☐ Black Fly Larva 
- ☐ Midge Larva 
- ☐ Right-handed Snail 
- ☐ Scud 

Group 4: Tolerant of Pollution

- ☐ Aquatic worms 
- ☐ Leech 
- ☐ Left-handed Snail 
- ☐ Mosquito Larva 

Other

- ☐ Water Boatman 
- ☐ Water Strider 
- ☐ _____
- ☐ _____

Water Turbidity & Temperature

Directions:

1. Working in PAIRS and using a thermometer set to degrees celsius, place the metal tip of the probe (not the whole thermometer) into the water. BE CAREFUL - THE PROBE END IS SHARP.
2. After the thermometer stops changing numbers (10 seconds or less), record the temperature in degrees celsius.
3. Repeat two more times.
4. Using the containers provided, carefully pour a sample of river water into the turbidity tube. Keep pouring water until the black and white disc is no longer visible. The disc is called a secchi disc - pronounced “sek- kee.”
5. Release some of the water it you go too far, you want to stop right at the point where you can no longer see the pattern.
6. Record the final end point and check off clear, cloudy, or muddy.

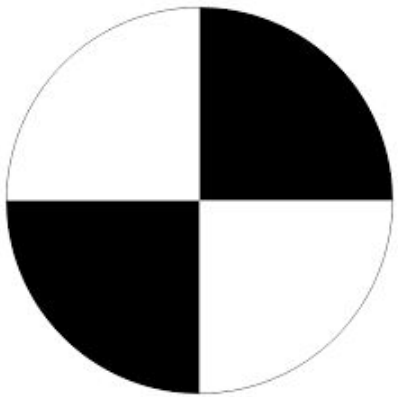
Badge Earned!

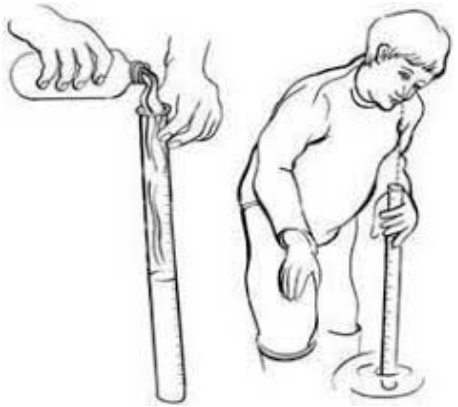
Water Temperature:

Test 1: _____ °C

Test 2: _____ °C

Test 3: _____ °C





Water Transparency:

Test 1: _____ cm

The water was: ✓

- ☐ clear
- ☐ cloudy
- ☐ muddy

Water Quality

Directions:

1. Working in PAIRS, follow the directions shared by the leader to CAREFULLY test the levels of certain chemicals found in the water using the test kits. These chemicals can help determine if the water is healthy or unhealthy for the animals and plants that live there.

pH Test
Healthy Range: 6.5 to 8.0
Unhealthy Range: < 6.5 or > 8.0

Nitrite Test
Healthy Range: .1 mg/l or less
Unhealthy Range: > .1 mg/l

Phosphate Test
Healthy Range: .2 mg/l or less
Unhealthy Range: > .2 mg/l

Badge Earned!

Record the number and check ✓ healthy or not healthy.

Water pH (acid level): _____
❑ Healthy ☺
❑ Not Healthy ☹

Nitrite Level: _____
❑ Healthy ☺
❑ Not Healthy ☹

Phosphate Level: _____
❑ Healthy ☺
❑ Not Healthy ☹

Lucas Co. Soil & Water

Soil Buddy Education Program

What is soil? What is it made of?

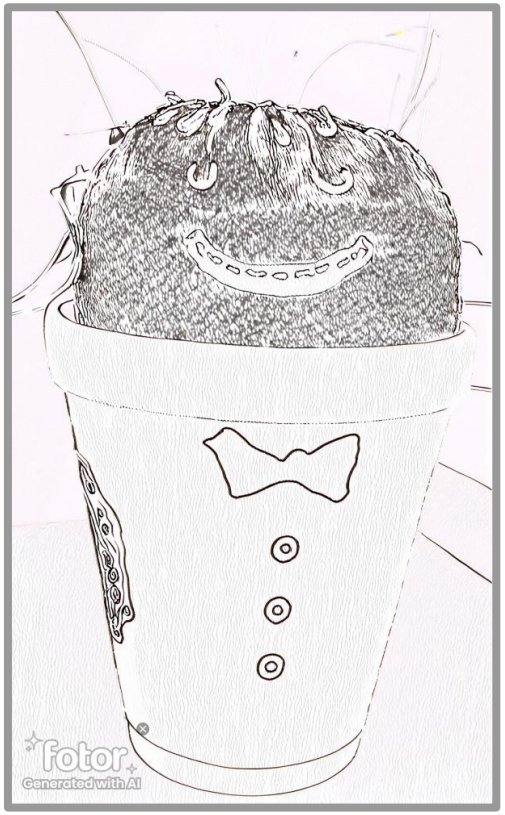
I - Inorganic Materials - Minerals, Rocks
O - Organic Materials - Leaves, Insects
W - Water
A - Air

What are some things we get from soil?

- **Food, clothing, building materials**, and so forth. Most of our resources can be traced back to plants, animals or minerals and therefore to soil.

Soil can be called **"the foundation of life" -** Everything we eat, drink, use, etc. comes from soil, grows in soil, is filtered by soil.

Badge Earned!



Different types of soil?

= Different combinations of **sand, silt, and clay**

What does a plant/seed need to grow?

Warmth, Moisture, Oxygen

1 Teaspoon of healthy soil contains **100 million - 1 billion** individual bacteria! Microscopic life and processes below ground are **more abundant than life above the ground**!

Toledo Zoo: Project Prairie

Uncover an Inquiry Question :

Where can I find the most bugs?

Explore Predictions:

Where do I think I will find the most bugs? Why?

Badge Earned!

Tally how many bugs you found:

Place	# of insects found
Lawn	
Prairie	

Think Hard about Findings and Share Discoveries!

Make a graph of where you found the most bugs.