



erie county
envirothon

Middle School Envirothon

Resource Packet 2021

*Written tests will include approximately 15 questions in a multiple choice, fill-in, or short answer format, including hands-on identification. They will be completed as a team.

Wildlife

1. Animals (see table)
 - a. Identification – mounts, skins, tracks and bird calls
 - b. <https://www.envirothonpa.org/wp-content/uploads/2017/10/Envirothon-Animal-Tracks.pdf>
 - c. Habitats
2. Ecology
 - a. Food requirements (omnivore, herbivore, carnivore)
 - b. Basic food chains and webs
 - c. Predator /prey relationships
3. Concerns
 - a. Definition of biodiversity and how it is beneficial to the environment
 - b. Habitat loss and fragmentation
 - c. https://wildlife.org/wp-content/uploads/2017/05/FactSheet-Fragmentation_FINAL.pdf
4. Role of PA Game Commission
 - a. Wildlife Conservation
 - b. [https://www.envirothonpa.org/wp-content/uploads/2019/10/North American Model of Wildlife Conservation.pdf](https://www.envirothonpa.org/wp-content/uploads/2019/10/North_American_Model_of_Wildlife_Conservation.pdf)

Aquatics

1. Identification (see table)
 - a. Fish
 - b. Macroinvertebrates
 - c. Amphibians and reptiles (including life cycles)
2. Watersheds

- a. Watersheds in Erie County: Names and ID on a map – Conneaut Creek, Elk Creek, Walnut Creek, Cascade Creek, Mill Creek, 6 Mile Creek, 16 Mile Creek, 20 Mile Creek
 - b. Function and value of wetlands (know 3)
https://www.envirothonpa.org/documents/Wetlands_TheVitalLink.pdf
 - c. Know 6 specific aquatic or wetland environments given their physical or biological characteristics (is the water moving? Are there fish, or only macroinvertebrates? Is the water very deep? What plants grown there?)
3. Concerns
- a. Invasive species
 - b. Habitat destruction and conservation
https://www.envirothonpa.org/wp-content/uploads/2016/10/Ghosts_of_the_Ohio_River.pdf
4. Role of PA Fish and Boat Commission

Soils and Land Use

- 1. Basic Soils knowledge
 - a. Soil horizons
 - b. Soil texture triangle
 - c. Sand, silt, and clay properties
- 2. Lake Erie Watershed
 - a. History – glacial lake
 - b. Erosion – definition, possible solutions
 - c. Identifying physical features on a topographic map – including contour lines
http://education.nationalgeographic.com/mapping/interactive-map/?ar_a=1
- 3. Soil Chemistry
 - a. Soil forming process and the FBI (fungi, bacteria, and insects)
 - b. Soil color and composition – what is a Munsell color chart and how does it work? Why is it important?
<https://www.envirothonpa.org/documents/munsellcharts.pdf>

Forestry

- 1. Plant and tree identification (see table) using bark, leaves, and IDing using a botanical key – “Key to Some Common Trees of PA”
 - a. Basic tree terms
 - i. Bark

- ii. Heartwood
 - iii. Sapwood
 - iv. Roots
 - v. Leaves
 - b. Invasive Plants
 - i. Current Threats and characteristics (be able to list and identify 5 in PA)
 - ii. https://www.envirothonpa.org/wp-content/uploads/2015/10/3-6-0_What-is-an-Invasive-Plant.pdf
2. Biology
- a. Plant cycle – seed, seedling, plant/tree, flower, fruit
 - b. Transpiration
 - c. Photosynthesis
3. Community
- a. Be able to identify a Biltmore stick, diameter tape, and a clinometer and explain what they do.
 - b. Forest succession and wildlife
<https://www.envirothonpa.org/documents/ForestSuccession.pdf>

Basic list of Wildlife: (Note: bird call ID highlighted in yellow)

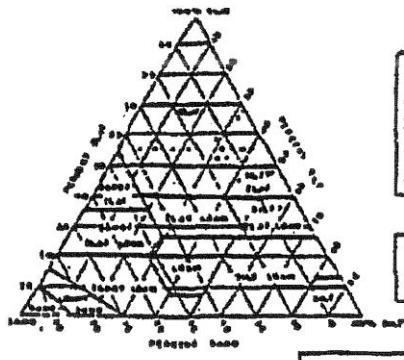
Weasel	Cottontail rabbit	Dove
Woodchuck	Meadowlark	Ruffed Grouse
Bobcat	Screech Owl	Northern Goshawk
Black capped chickadee	Common Grackle	Canada Goose
Great Blue Heron	Opossum	Grey Squirrel
Kestrel	Fisher	Striped skunk
European Starling	American Bittern	Red Fox

Basic list of Aquatic species: (Note: Frog and Toad call ID in yellow)

Bluegill	Slimy sculpin	Spotted Gar
Brook Trout/Brown trout	Creek Chub	Pumpkinseed
Aquatic Sowbug	Water Strider	Water penny
Backswimmer	Water scorpion	Damselfly larvae
Spring Peeper	Upland Chorus Frog	American Toad
Northern Leopard Frog	Gray Treefrog	Eastern Spadefoot Toad
Eastern hellbender	Spiny Softshell Turtle	Green salamander
Eastern hognose snake	Painted turtle	Five-lined skink
E. Massasauga Rattlesnake	Eastern Garter snake	Round Goby
DIDYMO	Jefferson salamander	Clubshell mussel

Basic list of Trees/plants:

Staghorn Sumac	Red Maple	White Ash
Bitternut Hickory	Eastern Hemlock	Ironwood/Hophornbeam
Yellow Birch	Black Cherry	Witch hazel
Sassafrass	Tuliptree	Elm
Sugar Maple	Basswood	Quaking Aspen
Hawthorn	Black Willow	Garlic Mustard
Autumn Olive	Japanese Knotweed	Phragmites
Spotted Lanterfly	Emerald Ash borer	Asian Longhorned Beetle



Start

Place approximately 25 g soil in palm. Add water dropwise and knead the soil to break down all aggregates. Soil is at the proper consistency when plastic and moldable, like moist putty.

Add dry soil to soak up water

Does soil remain in a ball when squeezed?

YES
Is soil too dry?

YES
Is soil too wet?

SAND

Place ball of soil between thumb and forefinger gently pushing the soil with the thumb, squeezing it upward into a ribbon. Form a ribbon of uniform thickness and width. Allow the ribbon to emerge and extend over the forefinger, breaking from its own weight.



LOAMY SAND

Does soil form a ribbon?

Does soil make a weak ribbon less than 1 inch long before breaking?

Does soil make a medium ribbon 1-2 inches long before breaking?

Does soil make a strong ribbon 2 in. or longer before breaking?



Excessively wet a small pinch of soil in palm and rub with forefinger

Does soil feel very gritty?

SANDY LOAM

Does soil feel very gritty?

SANDY CLAY LOAM

Does soil feel very gritty?

SANDY CLAY

Does soil feel very smooth?

SILT LOAM

Does soil feel very smooth?

SILTY CLAY LOAM

Does soil feel very smooth?

SILTY CLAY

Neither grittiness nor smoothness predominates

LOAM

Neither grittiness nor smoothness predominates

CLAY LOAM

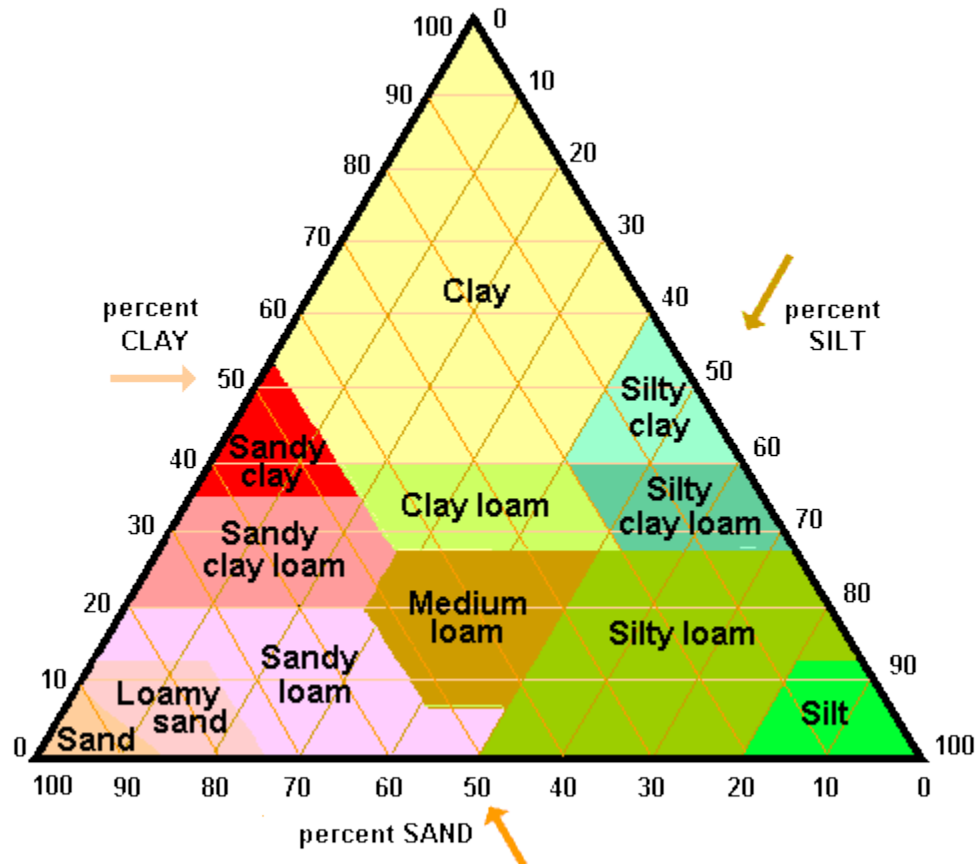
Neither grittiness nor smoothness predominates

CLAY

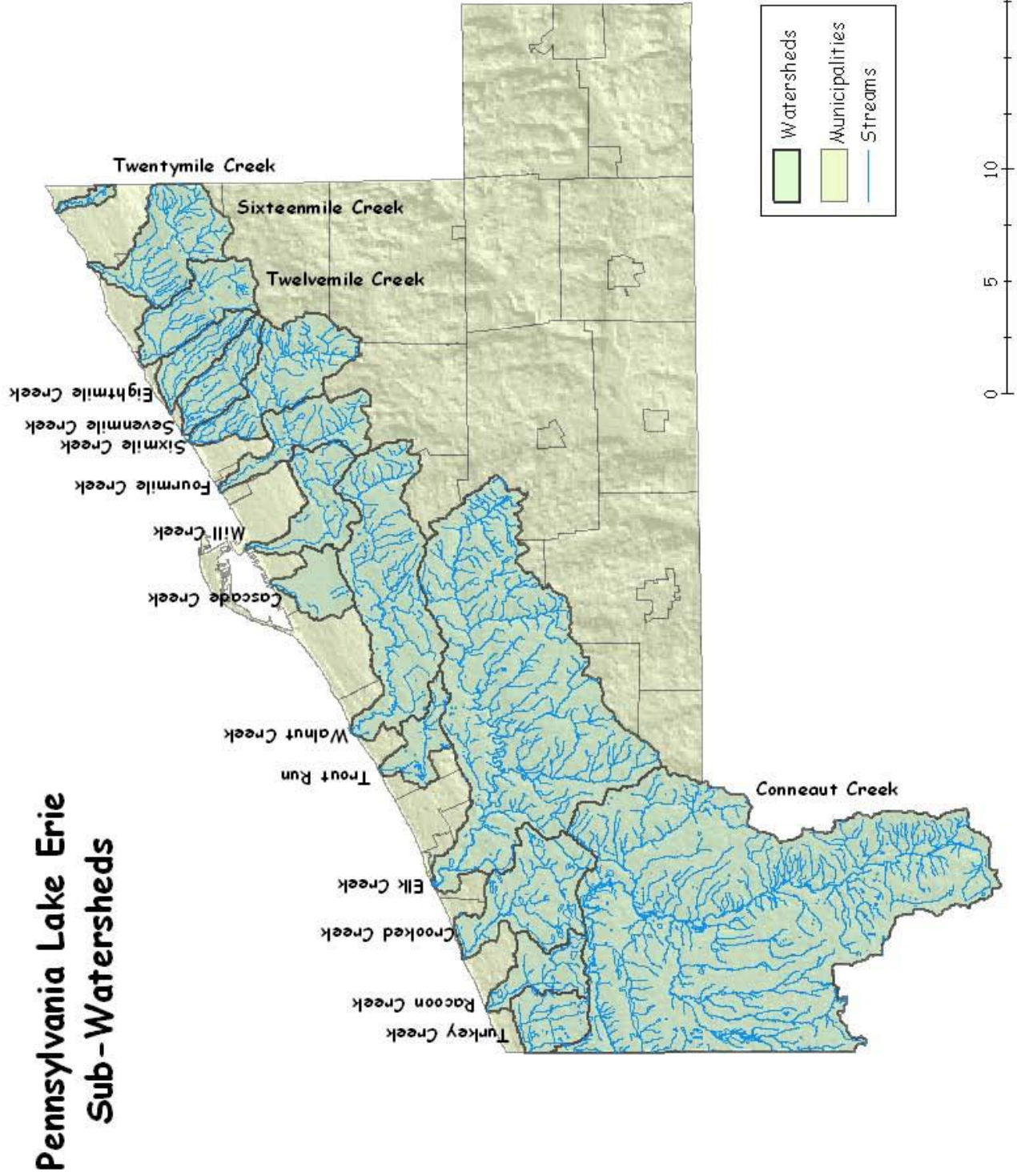
The Textural Triangle

Soil classification is typically made based on the relative proportions of silt, sand and clay. Follow any two component percentages to find the nominal name for the soil type. For example, 30% sand, 30% clay and 40% silt:

Find 30% along the bottom (sand) line, and follow the slanted line up and to the left. Stop at the horizontal line for 30% clay, and find the soil type: **clay loam**.



Soil Triangle is from the Idaho Association of Soil Conservation Districts, copyright 2010.



Adapted from the PA Envirothon High School resources