



erie county
envirothon

Middle School Envirothon

Resource Packet 2018

*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. 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. Avian influenza – see <http://www.pgc.pa.gov/Wildlife/Wildlife-RelatedDiseases/Pages/AvianInfluenza.aspx#1>
4. Role of PA Game Commission

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

3. Concerns

- a. Invasive species
- b. Human effect on aquatic habitat
- c. Harmful algal blooms in the Great Lakes (HABs)
https://www.glerl.noaa.gov/pubs/brochures/NOAA_HABs_in_Great_Lakes.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
(http://education.nationalgeographic.com/mapping/interactive-map/?ar_a=1)

3. Biology

- a. Definition of trophic level
- b. Soil Food web – reference graphic in What is Soil Health?

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. Forest Insects and Diseases
 - i. Current Threats
 - ii. Contributing Factors
 - iii. <http://www.dcnr.pa.gov/Conservation/ForestsAndTrees/InsectsAndDiseases/Pages/default.aspx>

2. Biology

- a. Plant cycle – seed, seedling, plant/tree, flower, fruit
- b. Transpiration
- c. Photosynthesis

3. Community

a. How to use a biltmore stick

b. Know products and uses of 10 important hardwoods grown in PA – use The Common Trees of Pennsylvania

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

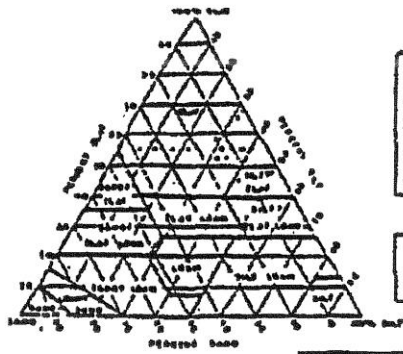
Mink	Cottontail rabbit	Dove
Woodchuck	Meadowlark	Ruffed Grouse
Bear	Northern Flicker	Northern Goshawk
Red-Winged Blackbird	Common Grackle	Eastern Screech Owl
Eastern Towhee	Opossum	Grey Squirrel
Kestrel	Canada Goose	Coyote
White-Throated Sparrow	Mallard Duck	Field Mouse
Skunk	River Otter	Least Shrew

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

Largemouth bass	Slimy sculpin	Bluegill
Brook Trout/Brown trout	Smallmouth bass	Northern pike
Dragonfly larvae	Mayfly larvae	Backswimmer
Cranefly larvae	Crayfish	Dobsonfly larvae
Wood Frog	Spring Peeper	American Toad
Gray TreeFrog	Green Frog	Northern Leopard Frog
Eastern hellbender	Red eft	Northern Red salamander
Painted turtle	Eastern Box turtle	Eastern Milk snake
Northern Water snake	Eastern Garter snake	Round Goby
DIDYMO	Yellow perch	Zebra 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
Grey Dogwood	Red oak	Apple tree
Hawthorn	Black Willow	Multiflora Rose
Crown Vetch	Purple Loosestrife	Phragmites
Emerald Ash Borer	Wooly Adelgid	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

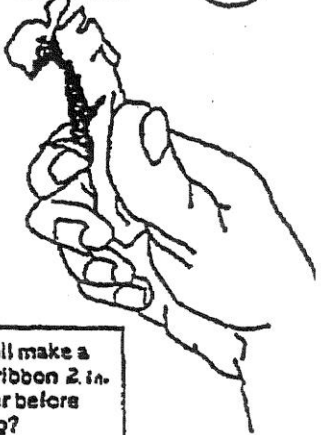
Does soil remain in a ball when squeezed?

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?

Does soil feel very gritty?

Does soil feel very gritty?

SANDY LOAM

SANDY CLAY LOAM

SANDY CLAY

Does soil feel very smooth?

Does soil feel very smooth?

Does soil feel very smooth?

SILT LOAM

SILTY CLAY LOAM

SILTY CLAY

Neither grittiness nor smoothness predominates

Neither grittiness nor smoothness predominates

Neither grittiness nor smoothness predominates

LOAM

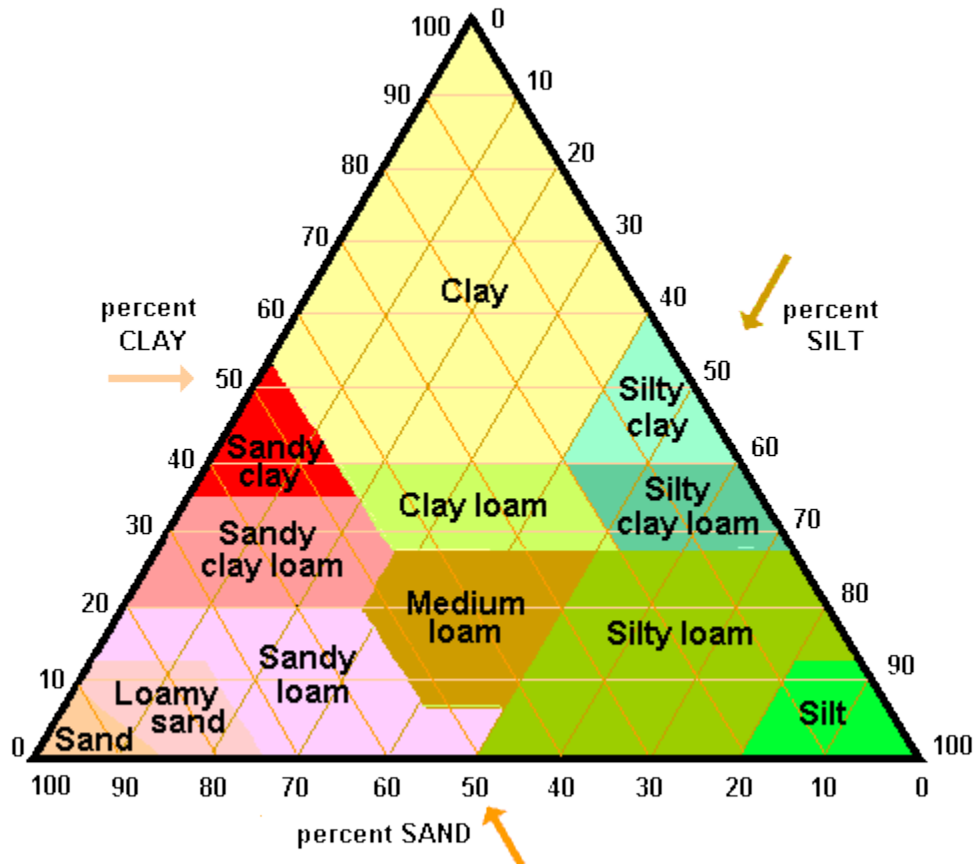
CLAY LOAM

CLAY

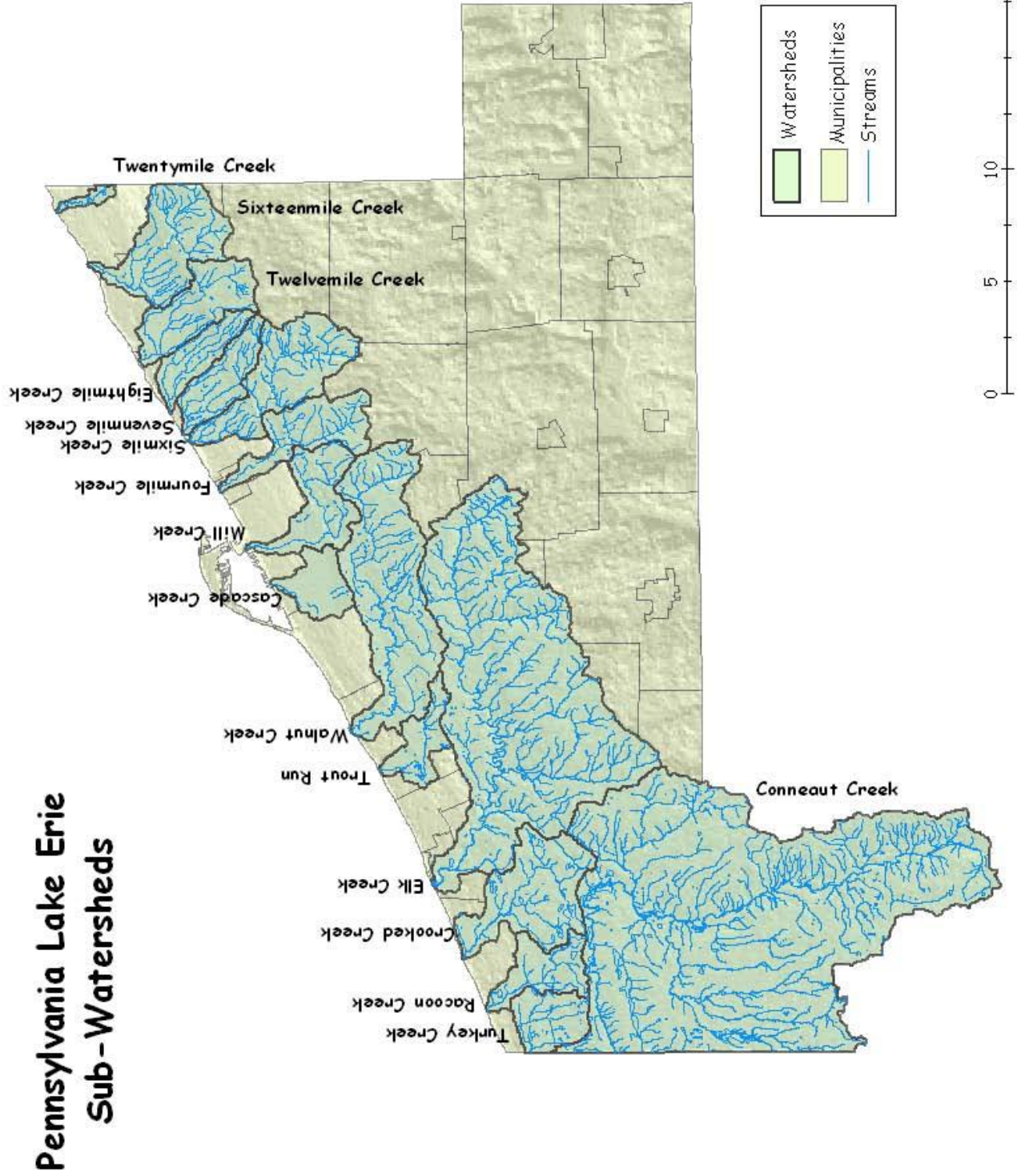
The Textural Triangle

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