Soil –

It’s not just dirt!
Kentucky’s soil is worth protecting.
“Land, then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals.”

Aldo Leopold, *A Sand County Almanac*, 1949
We depend on soil for food for people...
and food for wildlife.
Local farmers’ markets are becoming more popular, but the average American meal still travels about 1500 miles from farm to plate.

- Center for Urban Education About Sustainable Agriculture
We build roads, schools, houses, stores, hospitals and many other things on soil. Soil supports us in many ways!
Do you recognize this famous building?
It was built on soils that could not support the weight of the structure!
We depend on soil for many of the fabrics and other products we wear and use every day.
Without soil

- Blue jeans are made of cotton, grown in soil.
- Aluminum is mined from bauxite, found in soil.
- Penicillin was discovered in mold that grows in soil.
- Cereal is made from plants that grow in soil.
“This little patch of earth and this little pile of stones, I can wash the dust from off my face and skin, But this earth is in my bones.”

Ralph McTell – *Peppers and Tomatoes*, 1998
Soil is the thin upper layer of Earth’s crust capable of supporting plant life.
A cloak of loose, soft material, held to the earth's hard surface by gravity, is all that lies between life and lifelessness."

Wallace H. Fuller, in Soils of the Desert Southwest, 1975
“The outstanding scientific discovery of the twentieth century is not television, or radio, but rather the complexity of the land organism. Only those who know the most about it can appreciate how little we know about it.”

Aldo Leopold (1886–1948), *Round River*, 1949
Soils are different around the world.
An average soil will contain...

- **Organic Matter**: 5%
- **Mineral Particles**: 45%
- **Water**: 25%
- **Air**: 25%

**Organic matter** consists of living and dead plants and animals.

**Mineral particles** include clay, silt, sand, gravel, and stones.

Water and air are present in pore spaces in the soil.
Students use soil probes to look into the soil. From this sample, you can discover the soil’s *profile* and look at the different soil layers, called *horizons*. 
This soil profile shows five horizons.

Only a healthy, well-developed soil has all of these layers.
The proportion of the different mineral particle sizes in a soil is called texture. Soils are described by their texture - clay, silt or sand.

*Discovery Education, The Dirt on Soil – what’s really going on underground*
Soil *texture* makes a difference in how much water the soil will absorb, and how much water it will have available for plants to grow.

Clayey soils usually hold a lot of water and are “sticky” when wet. When dry, they are very hard!
Organic matter breaks down or decomposes to form soil.

Composting kitchen and yard waste is a good way to see soil being formed!
Rotten logs are a fun place to study how soil is formed!
Salamanders often live in the moist soil under a rotten log!
Many different animals – of all sizes - live in the soil.

Amoeba

Nematode

Mole

Earthworm
"We must come to understand our past, our history, in terms of the soil and water and forests and grasses that have made it what it is."

William Vogt, Road to Survival, 1948
Scientists have been studying soils for many years!
Was the new land a desert or a garden?

Could it produce crops to feed a growing nation?

The Lewis and Clark Expedition was instructed by President Jefferson to report on "the soil and face of the country."
Their journals contain the first detailed descriptions of the soils, plants, and animals native to an area that now spans 18 different states.

After the first winter of the Expedition in 1805 (Ft. Mandan, ND), Lewis and Clark sent samples of soil, minerals, plants and other items back to the President.
Reports from the Expedition excited Americans - the West was both a desert and a potential garden.

During the 20th Century, the United States saw the need for a thorough inventory of farmland and woodland to document potential productivity of the land. The result was the National Cooperative Soil Survey.
Kentucky has a state soil!

Crider Soil Profile
- Surface layer: brown silt loam
- Subsoil - upper: reddish brown silt loam
- Subsoil - middle: dark red silty clay loam
- Subsoil - lower: dark red clay

USDA Natural Resources Conservation Service
The Crider series was established in Caldwell County, Kentucky, in 1957. It is named after a community in the county.
The mission of the soil and water Conservation Districts of Kentucky is to work for the improvement and conservation of the soil, water, and related natural resources.
Soil erosion continues to be one of the main problems today.
Storm water carries precious soils into our waterways where it can smother aquatic life.
“Soil…is lost a little at a time over millions of acres by the careless acts of millions of people…"
It cannot be saved by heroic feats of gigantic technology but only by millions of small acts and restraints, conditioned by small fidelities, skills and desires...
Soil loss is ultimately a cultural problem; it will be corrected only by cultural solutions.”

Wendell Berry, "Conservation and Local Economy," 1992
• Written and produced by Mary Kathryn Dickerson for the Boone, Campbell and Kenton Conservation Districts

• Photographs courtesy of:
  – Sally Aaron, Mary Kathryn Dickerson, Mark Jacobs, and Kristin Scott, Conservation District Staff
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  – Microsoft Clip Art Gallery

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  – The Courier-Journal, Kentucky Soil-It’s Worth Protecting
  – Discovery Education, The Dirt on Soil – what’s really going on underground
  – Microsoft Clip Art Gallery

• Soils Paintings by:
  – Janis L. Lang, USDA Natural Resources Conservation Service – Soils
Beautiful rocks - beautiful grass
Beautiful soil,
where they both combine.
Beautiful river - covering sky
Never thought of possession,
but all this was mine."

- Bruce Cockburn, A Dream Like Mine, 1991