



Virginia Association of Soil and Water Conservation Districts

Soil Expert

**A Patch Program for Virginia Students
in Grade 3 and Above**





VA Association of Soil & Water Conservation Districts
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www.vaswcd.org



Henricopolis Soil & Water Conservation District
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The Conservation Poster Contest Patch Program was developed by the Virginia Association of Soil and Water Conservation Districts and the Henricopolis Soil and Water Conservation District.

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Soil and Water Conservation Districts

The VASWCD Educational Foundation Mission

The Virginia Association of Soil and Water Conservation Districts Educational Foundation is nonprofit and classified as a 501(c)(3) organization that was established in 1990. The VASWCD Educational Foundation provides and promotes leadership in the conservation of natural resources through stewardship and education programs. Funding for activities such as Envirothon, Youth Conservation Camp, Youth Conservation Leadership Institute and the Conservation Poster Contest are provided through donations made by individuals, corporations, organizations and other foundations as well as fundraising efforts. Contributions to the VASWCD Educational Foundation are used to support educational efforts within the Commonwealth.

There are 47 Soil and Water Conservation Districts serving localities throughout the Commonwealth of Virginia. Governed by a board of directors of local citizens, districts work hand-in-hand with state, federal and county agencies, other conservation organizations, schools, and many community partners to achieve their conservation objectives.

Districts offer many educational programs which target a variety of audiences. Emphasis is on education programs based on the VA Standards of Learning. Resources include activities, games, models, videos, skits, and more. Many districts also have a variety of resources available to teachers and scout leaders.

Contact information for the Soil and Water Conservation District serving each county in Virginia can be found on pages 4 and 5. If you can not find your Soil and Water Conservation District please reach out Bonnie Mahl– bonnie.mahl@vaswcd.org

Soil and Water Conservation Districts



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Soil and Water Conservation Districts

Listed by County/City

| County/City | SWCD |
|----------------------|-----------------------|
| Accomack Co. | Eastern Shore SWCD |
| Albemarle Co. | Thomas Jefferson SWCD |
| Alleghany Co. | Mountain SWCD |
| Amelia Co. | Piedmont SWCD |
| Amherst Co. | Robert E. Lee SWCD |
| Appomattox Co. | Robert E. Lee SWCD |
| Augusta Co. | Headwaters SWCD |
| Bath Co. | Mountain SWCD |
| Bedford Co. | Peaks of Otter SWCD |
| Bedford, City of | Peaks of Otter SWCD |
| Bland Co. | Big Walker SWCD |
| Botetourt Co. | Mountain Castles SWCD |
| Brunswick Co. | Lake Country SWCD |
| Buchanan Co. | Big Sandy SWCD |
| Buckingham Co. | Peter Francisco SWCD |
| Buena Vista, City of | Natural Bridge SWCD |
| Campbell Co. | Robert E. Lee SWCD |
| Caroline Co. | Hanover-Caroline SWCD |
| Carroll Co. | New River SWCD |
| Charles City Co. | Colonial SWCD |
| Charlotte Co. | Southside SWCD |
| Chesapeake, City of | Virginia Dare SWCD |
| Chesterfield Co. | James River SWCD |
| Clarke Co. | Lord Fairfax SWCD |
| Covington, City of | Mountain SWCD |
| Craig Co. | Mountain Castles SWCD |
| Culpeper Co. | Culpeper SWCD |
| Cumberland Co. | Peter Francisco SWCD |
| Dickenson Co. | Lonesome Pine SWCD |
| Dinwiddie Co. | Appomattox SWCD |

| County/City | SWCD |
|-------------------------|------------------------|
| Essex Co. | Three Rivers SWCD |
| Fairfax Co. | Northern Virginia SWCD |
| Fauquier Co. | John Marshall SWCD |
| Floyd Co. | Skyline SWCD |
| Fluvanna Co. | Thomas Jefferson SWCD |
| Franklin Co. | Blue Ridge SWCD |
| Frederick Co. | Lord Fairfax SWCD |
| Fredericksburg, City of | Tri-County/City SWCD |
| Galax, City of | New River SWCD |
| Giles Co. | Skyline SWCD |
| Gloucester Co. | Tidewater SWCD |
| Goochland Co. | Monacan SWCD |
| Grayson Co. | New River SWCD |
| Greene Co. | Culpeper SWCD |
| Greenville Co. | Chowan Basin SWCD |
| Halifax Co. | Halifax SWCD |
| Hanover Co. | Hanover-Caroline SWCD |
| Harrisonburg, City of | Shenandoah Valley SWCD |
| Henrico Co. | Henricopolis SWCD |
| Henry Co. | Blue Ridge SWCD |
| Highland Co. | Mountain SWCD |
| Isle of Wight Co. | Peanut SWCD |
| James City Co. | Colonial SWCD |
| King George Co. | Tri-County City SWCD |
| King & Queen Co. | Three Rivers SWCD |
| King Williams Co. | Three Rivers SWCD |
| Lancaster Co. | Northern Neck SWCD |
| Lee Co. | Daniel Boone SWCD |
| Lexington, City of | Natural Bridge SWCD |

Soil and Water Conservation Districts

Listed by County/City



| County/City | SWCD |
|---------------------|------------------------|
| Loudoun Co. | Loudoun SWCD |
| Louisa Co. | Thomas Jefferson SWD |
| Lunenburg Co. | Southside SWCD |
| Lynchburg, City of | Robert E. Lee SWCD |
| Madison Co. | Culpeper SWCD |
| Mathews Co. | Tidewater SWCD |
| Mecklenburg Co. | Lake Country SWCD |
| Middlesex Co. | Tidewater SWCD |
| Montgomery Co. | Skyline SWCD |
| Nelson Co. | Thomas Jefferson SWCD |
| New Kent Co. | Colonial SWCD |
| Northampton Co. | Eastern Shore SWCD |
| Northumberland Co. | Northern Neck SWCD |
| Nottoway Co. | Piedmont SWCD |
| Orange Co. | Culpeper SWCD |
| Page Co. | Shenandoah Valley SWCD |
| Patrick Co. | Patrick SWCD |
| Petersburg, City of | Appomattox River SWCD |
| Pittsylvania Co. | Pittsylvania SWCD |
| Powhatan Co. | Monacan SWCD |
| Prince Edward Co. | Piedmont SWCD |
| Prince George Co. | James River SWCD |
| Prince William Co. | Prince William SWCD |
| Pulaski Co. | Skyline SWCD |
| Rappahannock Co. | Culpeper SWCD |
| Richmond Co. | Northern Neck SWCD |
| Roanoke, City of | Blue Ridge SWCD |
| Roanoke Co. | Blue Ridge SWCD |
| Rockbridge Co. | Natural Bridge SWCD |

| County/City | SWCD |
|-------------------------|------------------------|
| Rockingham Co. | Shenandoah Valley SWCD |
| Russell Co. | Clinch Valley SWCD |
| Scott Co. | Scott County SWCD |
| Shenandoah Co. | Lord Fairfax SWCD |
| Smyth Co. | Evergreen SWCD |
| Southampton Co. | Chowan Basin SWCD |
| Spotsylvania Co. | Tri-County/City SWCD |
| Stafford Co. | Tri-County/City SWCD |
| Staunton, City of | Headwaters SWCD |
| Suffolk, City of | Peanut SWCD |
| Surry Co. | Peanut SWCD |
| Sussex Co. | Chowan Basin SWCD |
| Tazewell Co. | Tazewell SWCD |
| Virginia Beach, City of | Virginia Dare SWCD |
| Warren Co. | Lord Fairfax SWCD |
| Washington Co. | Holston River SWCD |
| Waynesboro, City of | Headwaters SWCD |
| Westmoreland Co. | Northern Neck SWCD |
| Williamsburg, City of | Colonial SWCD |
| Winchester, City of | Lord Fairfax SWCD |
| Wise Co. | Lonesome Pine SWCD |
| Wythe Co. | Big Walker SWCD |
| York Co. | Colonial SWCD |



Earning the Patch

The Soil Expert patch is designed for students in 3rd Grade but may be enjoyed by older students as well. On pages 6-11, background information to assist you in completing this patch. You can also access the resource information at the end of this booklet for more. To earn the patch please [click here](#) visit this site to fill out the google form to answer the questions about soils to show that you are a Soils Expert.

What is Soil?



Soil is a mix of minerals, air, water and organic matter— organisms and the decaying remains of once living things.

Soil is amazing! It is...

- ♥ Light and heavy.
- ♥ Strong enough to hold up a skyscraper.
- ♥ Fragile enough to be blown away by the wind.
- ♥ Loose enough to flow like a river.
- ♥ Solid as a mountain.

What's the difference between soil and dirt? Dirt is what you find under your fingernails. Soil is what you find under your feet. Think of soil as a thin living skin that covers the Earth.



Why is Soil Important?

Every living plant and animal depends on the condition of our soil, so we must protect it! Soil conservation is all about protecting that natural resource so that it is here for us and for future generations to use.

A conservationist is someone who works to save or conserve things in nature. Anyone can be a soil conservationist... even you!



How is Soil Formed?



When trying to understand the formation of soil, there are 5 key factors—parent material, climate, topography, biology and time.



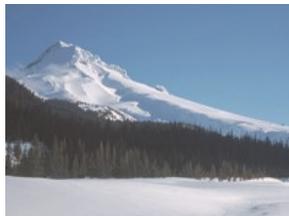
Parent Material

When the weather gets hot, rocks can get bigger. When the weather turns cold, rocks can get smaller. If this happens often enough, the rock will crack and break up into small pieces that break into even smaller pieces. When they get really small they turn into soil. Rain and ice can also get into rocks and break them apart.



Climate

Warmer temperatures and an abundance of water speed up the formation of soil. Cooler temperatures and less rain slows down soil formation. So humid locations tend to have a richer and deeper soil than cooler and dryer landscapes.



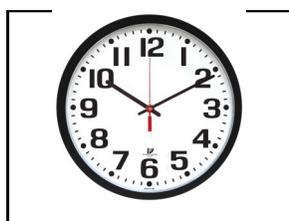
Topography

The up and down changes in hills and mountains is referred to as topography. In areas which are flat, the soil gets deeper more quickly than the surface erodes away. On steep slopes, erosion takes place more quickly than the formation of new soil. The result is that flat locations have a deeper, more mature soil layer than location with a steep slope.



Biology

Bio means life. Living organisms have a big impact on soil. Plants and animals provide nutrients to the soil in the form of waste products and dead bodies. A variety of micro-organisms perform important jobs in the soil that can help decompose living materials and give richness to the soil.



Time

Soil doesn't form overnight. In fact, soil formation can take thousands of years. It can take 500 years or more to form 1 inch of topsoil.



Types of Soil



Sand, silt and clay are the basic types of soil. Most soils are made up of a combination of these three. How soil looks and feels depends upon the amount of each type in that particular area. Sand feels *gritty* to the touch, silt feels *powdery* and clay feels *sticky*.

Water soaks into soil at different speeds, depending on the soil type. The large particles of sand allow soil to drain quickly. Clay's small particles packed close together hold water longer.

Soil Layers



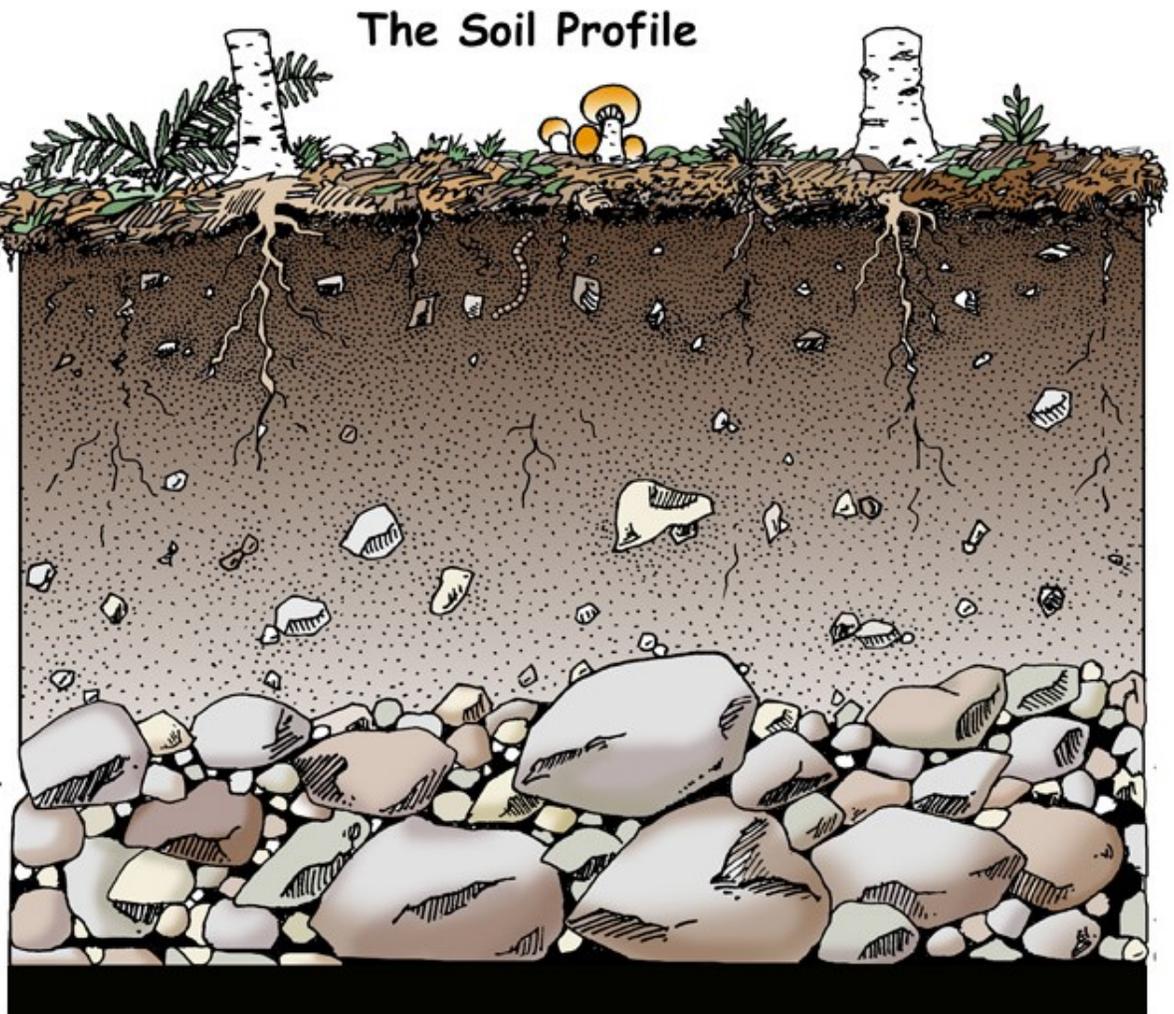
Surface Litter - Layer O
Leaves, branches, animal scat and bodies, mushrooms and other rotting matter.

Topsoil - Layer A
Also called **humus**. Rotting organic matter from the litter layer and minerals from weathering rocks.

Subsoil - Layer B
Crumbling rock, sand, clay, gravel and silt.

Parent Material - Layer C
Partially weathered rock underlying the soil layers.

Bedrock - Layer R





Conserving Soil

Soil erosion occurs when there is nothing to keep soil in place and water or wind moves it from one place to another. We can help prevent erosion by:



Plant trees and groundcover.



Grow plants on slopes.



Try no-dig gardening.



Plant a rain garden.



Use a rain barrel to catch runoff from your roof.



Build terraces and retaining walls.

Resources



Educational Resources for Children | Soil Science Society of America

<https://www.soils.org/smithsonian/children>

Kids Love Soil! Do You Dig Dirt? The links to the cool sites and activities on this page are to **educational**, government, and SSSA member web pages.

The Dirt on Soil - Free Teacher Resources - Discovery Education

<http://school.discoveryeducation.com/schooladventures/soil/>

Explore **soil** ecology, meet microscopic creatures, and journey underground in the virtual reality voyage of the Earthship. From the Discovery Channel school.

Soil Science Education Home Page - NASA

<http://soil.gsfc.nasa.gov/>

Aims to foster awareness about **soil** and its importance to life. With practical and illustrated **soil** science activities for school **children**.

The Earth's Soil - Geology For Kids - By KidsGeo.com

<http://www.kidsgeo.com/geology-for-kids/0002-the-earths-soil.php>

Educational Website For **Kids** ... **Soil** is found on the upper most layer of the Earth . **Soil** consists of a mixture of weathered rock, finely ground into powder, minerals and a variety of living and dead lifeforms.

Kids Site - Butler Soil and Water Conservation District

<http://www.butlerswcd.org/Education/Kids.html>

Great games and activities on natural resources for **children**.

Soil Education Material Flyer

http://www.nacdnet.org/education/resources/soils/pdfs/product_flyer.pdf

Soil Education Materials. Written for **children** ages 9-12. Get **kids** excited about the living world of **soil!** ... activities; list of **soil education** resources.

TLC "Science Projects for Kids: Soil Experiments"

<http://tlc.howstuffworks.com/family/science-projects-for-kids-soil-experiments.htm>

Science projects for **kids**: **soil** experiments let kids get their hands dirty while learning.

Virginia Soil Information

<https://www.soils4teachers.org/files/s4t/k12outreach/va-state-soil-booklet.pdf>