

Soils

Major Concept: Weathering, Erosion, Decay of plants and animals

Concept

Skill

Vocabulary: residual soil

Observation

mature soil

Lab skills

humus

porosity

leaching

root pry

exfoliation

transported soil

subsoil

horizon

Core Content

SC-M-2.1.4 Soil consist of weathered rocks and decomposed organic material from dead plants, animals, fungi, protists, and bacteria. Soils are often found in layers with each having a different chemical composition and texture.

Program of Studies

Grade 7 Earth/Space (Structure of the Earth System) Students will demonstrate...and examine characteristics of soils.

Soil pretest

Challenge

Growing up we all heard, “take off those shoes before you come in the house.” Or, “You have more dirt on you than in the yard.” Living in a rural community where agriculture is an important part of the economy it is common to hear phrases such as; “that sure is good dirt,” or “look how pretty that ground worked up.” People that depend on the land for their living are very aware of the importance of good soil. But what is good dirt/soil? What characteristics do farmers look for in good soil? What makes one type of soil better for growing a certain crop than another type of soil?

(Before I begin teaching this unit I always read passages from books about the dust bowl during the 30’s.)

Task #1

Days 1-4 read and discuss section on soils from textbook or handout. Do the hands on activities.

Task # 2

Have each student to bring in a sample of soil from their yard or from somewhere close to where they live. Have hand lens and stereomicroscopes for each student to examine their soil. Have students to record observations on a chart

pieces of plants	pieces of insects/animals	live insects	rocks
------------------	---------------------------	--------------	-------

Task # 3

Make a big chart of all the classes findings and have them mark the location on a county map of where their soil came from. Compare their findings. Can students see or find a pattern.

Task # 4

Have the county extension agent come to your classroom to do a presentation on soils. Have them demonstrate some of the test that they are asked to perform on soils.

Task #5

Have a local farmer or gardener come to your classroom and discuss with students what they think makes good soil.

Soils Pre-Test

Name _____

Period _____

Date _____

- _____ 1. The breaking off of rock pieces in curved sheets parallel to the rock's surface is _____
a. oxidation b. carbonation c. root-pry d. exfoliation
- _____ 2. Rocks can be broken apart by _____
a. organic activity b. root-pry c. frost action d. all of these
- _____ 3. The wearing away of rocks by solid particles carried by wind, water, and other forces is called _____
a. exfoliation b. abrasion c. oxidation d. gravity
- _____ 4. Most chemical weathering is caused by _____
a. air pollution b. water c. sulfuric acid d. gravity
- _____ 5. The decayed parts of plants and animals in soil are called _____
a. humus b. topsoil c. residual soil d. mature soil
- _____ 6. If the minerals in a rock enable the rock to resist chemical weathering, the rock is described as _____
a. stable b. soluble c. organic d. residual
- _____ 7. The solid rock layer beneath the soil is called _____
a. transported soil b. bedrock c. residual rock d. mature soil
- _____ 8. The size of individual soil particles is called soil _____
a. profile b. horizon c. texture d. porosity
- _____ 9. The process in which water washes minerals from one soil horizon to another is called _____
a. leaching b. oxidation c. exfoliation d. claying
- _____ 10. Acid rain is rain that contains _____
a. carbonic acid b. sulfuric acid c. carbon dioxide d. plant acids
- _____ 11. Most cracks and potholes in roads are caused by _____
a. frost action b. abrasion c. root-pry d. decomposition
- _____ 12. Mosses and lichens are able to break up rock mostly because of _____
a. root-pry b. acid production c. carbonation d. exfoliation
- _____ 13. Soil that remains on top of its parent rock is called _____
a. residual soil b. humus c. transported soil d. topsoil
- _____ 14. Decaying plant or animal material in soil is called _____
a. subsoil b. talus c. humus d. nitrate

Science Open Response Soils

Multiple Choice Number your paper 1-5 at the top

- _____ 1. The breaking off of rock pieces in curved sheets parallel to the rock's surface is _____
a. oxidation b. carbonation c. root-pry d. exfoliation
- _____ 2. Rocks can be broken apart by _____
a. organic activity b. root-pry c. frost action d. all of these
- _____ 3. The wearing away of rocks by solid particles carried by wind, water, and other forces is called _____
a. exfoliation b. abrasion c. oxidation d. gravity
- _____ 4. Most chemical weathering is caused by _____
a. air pollution b. water c. sulfuric acid d. gravity
- _____ 5. The decayed parts of plants and animals in soil are called _____
a. humus b. topsoil c. residual soil d. mature soil

Open Response

Spring is finally here. At least that is what the calendar says. Almost everyone is getting SPRING FEVER. Farmers are out in their fields, adults are out in their yards, and kids are outside whenever possible.

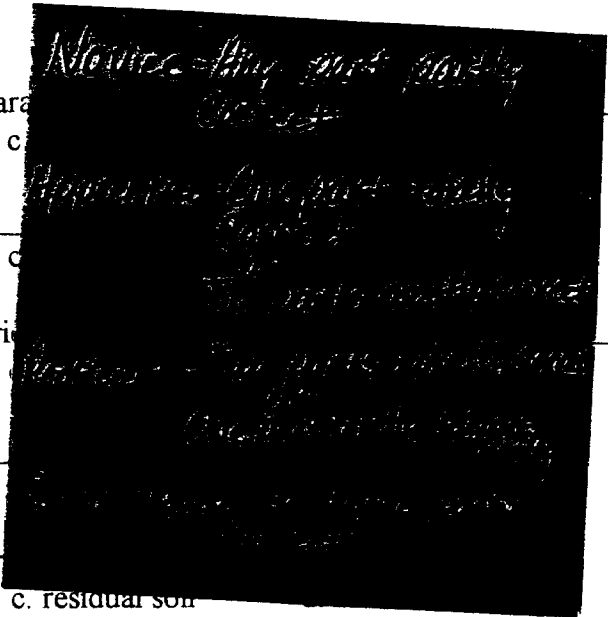
One of my favorite things to do this time of year is to work out in the yard with my flowers, roses, trees, plants, and shrubs. For each of these to grow and be healthy I need healthy soil.

- A. Describe healthy soil.
- B. Identify three (3) forces that cause soil to be formed.
- C. Explain (in detail) how each of these forces produces soil.

Science Open Response Soils

Multiple Choice Number your paper 1-5 at the top

- _____ 1. The breaking off of rock pieces in curved sheets parallel to the surface is called _____
a. oxidation b. carbonation c. exfoliation
- _____ 2. Rocks can be broken apart by _____
a. organic activity b. root-pry c. abrasion
- _____ 3. The wearing away of rocks by solid particles carried by water is called _____
a. exfoliation b. abrasion c. carbonation
- _____ 4. Most chemical weathering is caused by _____
a. air pollution b. water c. carbon dioxide
- _____ 5. The decayed parts of plants and animals in soil are called _____
a. humus b. topsoil c. residual soil

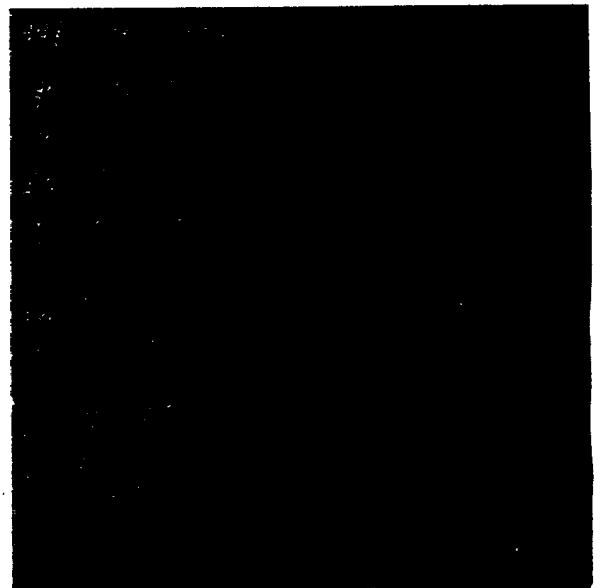
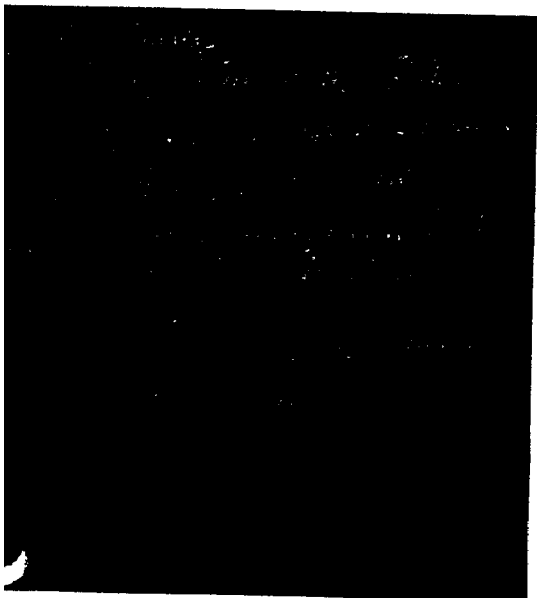


Open Response

Spring is finally here. At least that is what the calendar says. Almost everyone is getting SPRING FEVER. Farmers are out in their fields, adults are out in their yards, and kids are outside whenever possible.

One of my favorite things to do this time of year is to work out in the yard with my flowers, roses, trees, plants, and shrubs. For each of these to grow and be healthy I need healthy soil.

- A. Describe healthy soil.
- B. Identify three (3) forces that cause soil to be formed.
- C. Explain (in detail) how each of these forces produces soil.



Earth Test

1. The shape of an organism preserved in rock is called a(an) _____.
a. mold and cast b. coprolite c. imprint d. petrification
2. Bodies of whole animals have been preserved in _____.
a. ice b. tar c. amber d. all of these
3. Rocks formed from the piling up of layers of dust, dirt, and sand are called _____.
a. igneous b. metamorphic c. magma d. sedimentary
4. The decay rate of a radioactive element is measured by a unit called _____.
a. period b. era c. half-life d. unconformity
5. The animal used as an index fossil for the Paleozoic Era is the _____.
a. sago palm b. dinosaur c. trilobite d. *Eryops*
6. A measure of how many years ago an event occurred or an organism lives is _____.
a. absolute age b. relative age c. decay time d. sedimentary age
7. The thin outermost layer of the Earth is called the _____.
a. mantle b. Moho c. crust d. core
8. The ability of a solid to flow is called _____.
a. ductility b. plasticity c. seismology d. porosity
9. The layer that makes up most of the Earth's mass and volume is the _____.
a. mantle b. magma c. crust d. core
10. The crust of the Earth is made mostly of _____.
a. oxygen and silicon b. iron and silicon c. iron and nickel d. copper and nickel
11. The boundary between the mantle and the outermost layer of the Earth is called the _____.
a. Moho b. outer core c. lithosphere d. bedrock
12. The Earth's inner core is made of _____.
a. oxygen and silicon b. iron and nickel c. iron and silicon d. copper and nickel
13. Rocks can be broken apart by _____.
a. organic activity b. root-pry c. frost action d. all of these
14. The wearing away of rocks by solid particles carried by wind, water, and other forces is called _____.
a. exfoliation b. abrasion c. oxidation d. gravity
15. Most chemical weathering is caused by _____.
a. air pollution b. water c. sulfuric acid d. gravity

Earth Test

16. The decayed parts of plants and animals in soil are called _____
a. humus b. topsoil c. residual soil d. mature soil
17. If the minerals in a rock enable the rock to resist chemical weathering, the rock is described as _____.
a. stable b. soluble c. organic d. residual
18. The solid rock layer beneath the soil is called _____.
a. transported soil b. bedrock c. residual soil d. mature soil
19. The size of individual soil particles is called soil _____.
a. profile b. horizon c. texture d. porosity
20. The process in which water washes minerals from one soil horizon to another is called _____.
a. leaching b. oxidation c. exfoliation d. claying
21. Metamorphic rocks with mineral crystals arranged in parallel layers, or bands, are _____.
a. clastic b. intrusive c. porphyritic d. foliated
22. The way in which a mineral reflects light from its surface is its _____.
a. streak b. luster c. fracture d. brilliance
23. The softest mineral in the Mohs hardness scale is _____.
a. fluorite b. talc c. diamond d. calcite
24. The breaking of a mineral along smooth definite surfaces is called _____.
a. cleavage b. fracture c. splintering d. foliation
25. Elements that have shiny surfaces and are able to conduct electricity and heat are called _____.
a. metals b. nonmetals c. ores d. gemstones

Matching Vocabulary

26. igneous rock _____
27. sedimentary rock _____
28. metamorphic rock _____
29. fossil _____
30. lithosphere _____
- A. formed by the compacting and cementing of sediments or by other non-igneous processes at the Earth's surface.
- B. remains or evidence of a living thing.
- C. formed from molten rock.
- D. part of the Earth's surface covered by land; solid, topmost part of the Earth.
- E. changed in form as a result of chemical reactions, heat, and/or pressure.

Essay

31. Why is pyrite called "fool's gold"? What tests can be performed in order to avoid being fooled?
32. Look at the rock on the desk. Design an experiment to determine the type of rock it is. Be specific about the kinds of test you use to determine the rock type. Describe the rock's origin.