

DIG IT!

The Scoop on Soil.

Soil is a complex mix of ingredients: minerals, air, water, and organic matter—decaying remains of once-living things and countless organisms.

Why is Soil important? You need it for...



FOOD

Most of our **food** comes from plants anchored in and nourished by soil.



CLOTHES

Most of the **clothes** we wear are made with fibers from plants grown in the soil.



AIR & WATER

Part of the **oxygen** we breathe is produced by plants living in the soil. Much of the **water** we drink and use is filtered by soil.



BUILDINGS

Nearly everything we **build** is built on soil (and often with it).

And the Earth needs it. Soil is the thin outermost layer of the Earth's crust.

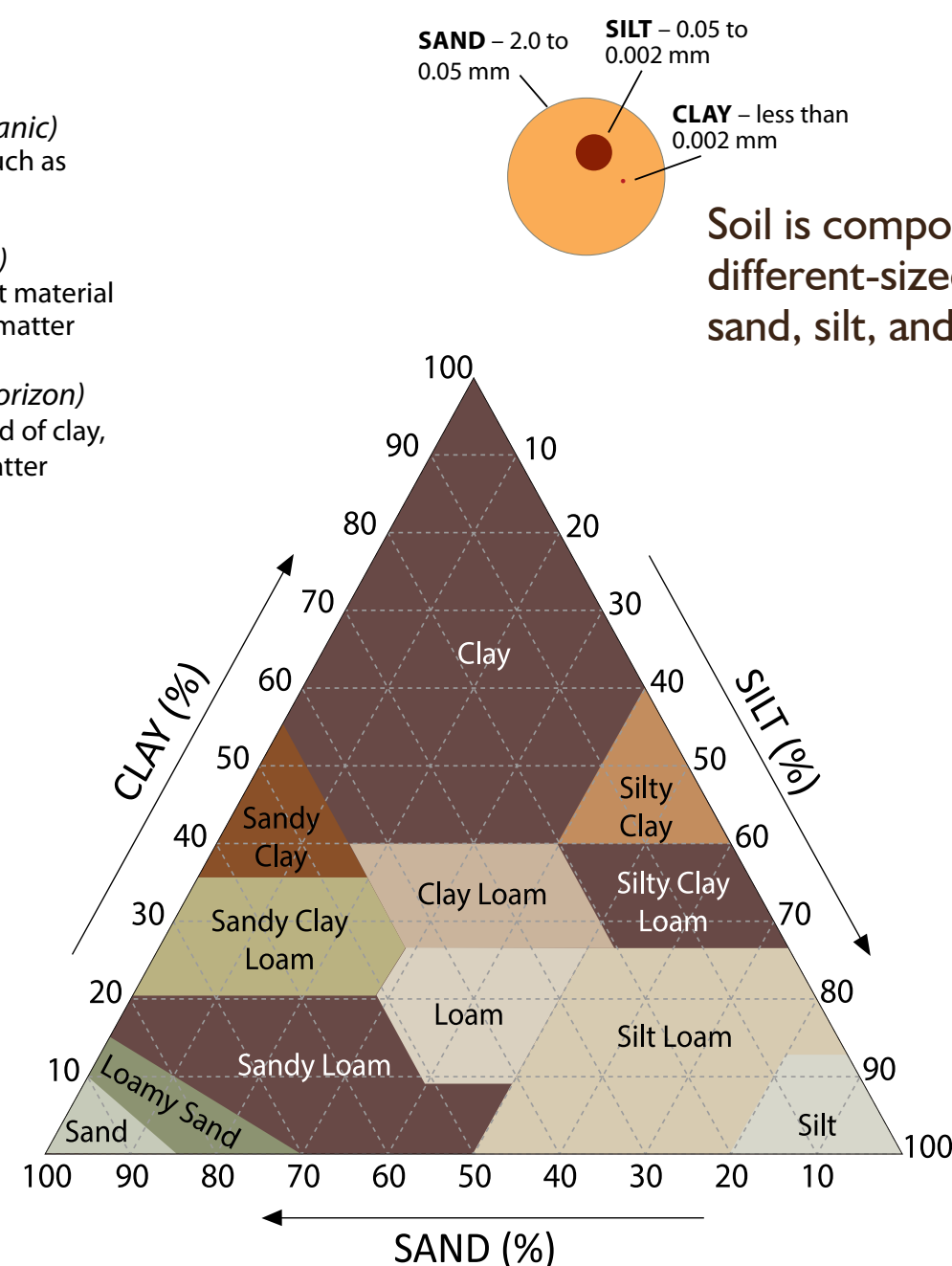
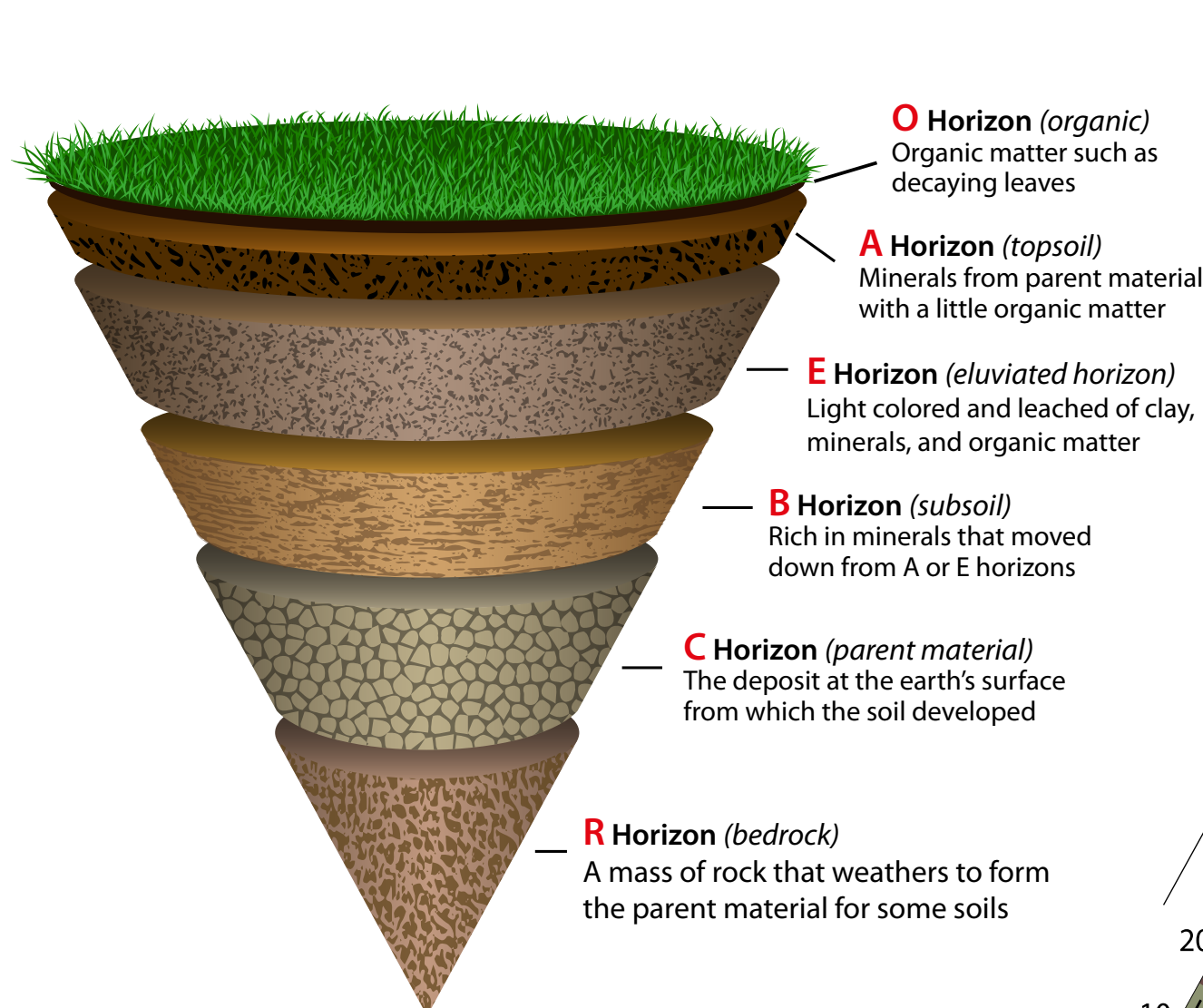
Dirt is not soil.

Dirt is soil particles that are out of place—no longer part of the soil on the ground. It doesn't have the properties that provide nutrients to grow food and filter our water.



Dig Deeper

Soil comes in many colors—from blue-grey to brown to red. Soil has layers called horizons. These horizons may look different and they tell the story of how a soil formed over time. Together the horizons are called a *soil profile* (photo left).



A soil texture triangle helps identify the soil type.

Soil Profile

How does soil become soil?

There are many different soils in the world. All soils are different because of where and how they formed. Over time, **5 major factors** play a part in how a soil forms. Together these factors are called **C L O R P T**.

C L O R P T | 5 factors of soil formation



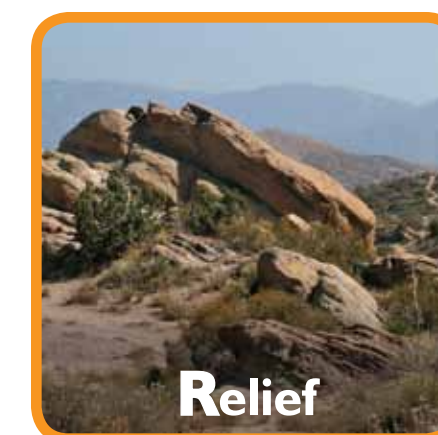
CLimate

CL—Temperature and moisture influence the speed of chemical reactions, which in turn help control how fast rocks weather and dead organisms decompose. Soils develop fastest in warm, moist climates and slowest in cold or arid (dry) ones.



Organisms

O—Plant roots spread, animals burrow, and bacteria eat. These and other soil organisms speed up the breakdown of large soil particles into smaller ones. Roots are a powerful soil-forming force, cracking rocks as they grow. And roots produce carbon dioxide that mixes with water, forming an acid that wears away rock.



Relief

R—The shape of the land and the direction it faces make a difference in how much sunlight a soil gets and how much water it holds. Deeper soils form at the bottom of a hill than at the top because gravity and water move soil particles down the slope.



Parent material

P—Just like you inherited characteristics from your parents, every soil inherits traits from the materials in which it forms. Soils that formed from limestone bedrock, for example, are rich in calcium. Soils that formed from materials at the bottom of lakes are high in clay.



Time

T—Older soils differ from younger soils because they have had longer to develop. In the northern US, soils tend to be young because glaciers covered the surface during the last Ice Age. In the southern US, there were no glaciers, so the soils have been exposed for a longer time, making them more weathered.

Soils are always forming and changing

Additions. Rain adds water. Dust adds minerals. Animal wastes add organic matter and nutrients. Humans add fertilizers.



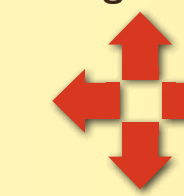
Losses. Water in soil evaporates. Nutrients are taken up by plants. Soil particles wash away in a storm. Organic matter may decompose into carbon dioxide.



Translocations (when things move within the soil). Gravity pulls water (carrying minerals and nutrients) down from top to bottom. Evaporating water draws minerals up from the bottom to top. Organisms carry material every which way.



Transformations (when things change into other things). Dead leaves decompose into smaller organic materials. Rock weathers into soft clay. Oxygen reacts with iron, "rusting" the soil to a reddish color.



This is just the beginning of the exciting world of Soil!

soils4teachers.org | soils4kids.org



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