What universal contents do we need for the international soil education guideline in preschool, primary school, and secondary school

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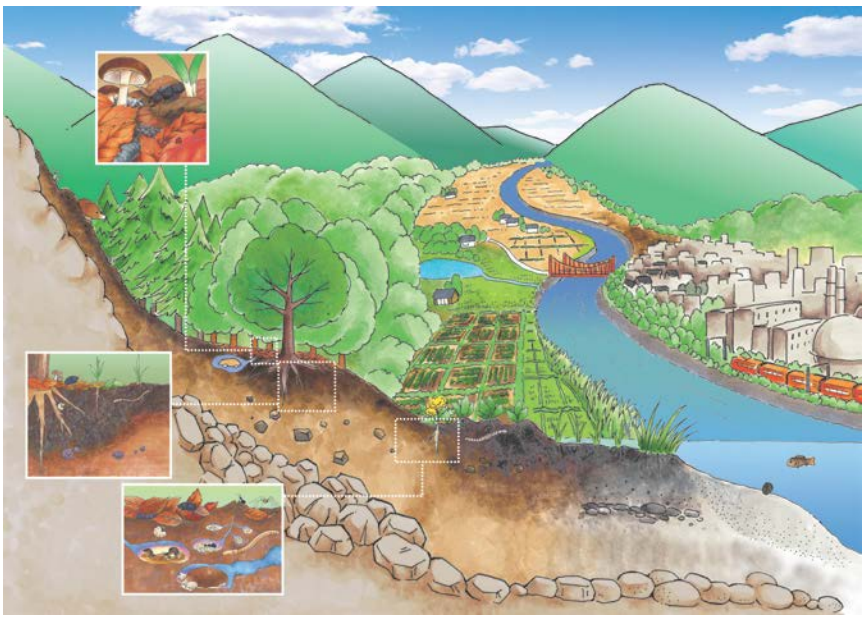

Soil plays an important role in each ecosystem.

It is important for school students to learn about soil correctly.

…but not all countries have content of soil in their curricula.

SDGs
#2 Zero hunger
#5 Gender Equality
#6 Clean Water and Sanitation
#13 Climate Action
#15 Life on Land

we need…

International soil education guideline

A torch for making education curriculum in various countries!

The concept of the guideline is presented (Hirai, et al.).

In this presentation, we discuss about…

◆What is required in the universal guideline in preschool, primary school and secondary school?

We suggest universal contents of soil education

Preschool (perception - sensitization):
touch and recognize soil as a part of nature

Primary school (be aware of - know of):
➢nature of soil (what soil is)
➢Important soil functions
- Supply nutrients
- Provide place of decomposition
- Provide habitats for various organisms
- Play role in water circulation
- Play role in gas exchange

Secondary school (know of):
soils in relation to ecosystems
↓
Higher education

Referring to the guideline,
curriculum in each country may be revised or new contents may be introduced.

✓ The content included
✕ The content not included
➡ Alteration suggested

Programme of study in UK

Grade	Programme of Study (UK)		
Primary school 1	**Plants** · identify common plants, deciduous / evergreen trees · basic structure of plant body	**Animals, including humans** · identify common animals including fish, amphibians, reptiles, birds and mammals / carnivores, herbivores and omnivores	**Seasonal changes**
Primary school 2	**Plants** · how seeds and bulbs grow into mature plants · find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	**Animals, including humans** · offspring and adults · basic needs of animal (water, food and air)	**Living things and their habitats** · living and dead things · concept of habitats ➡ Include habitats in soil · variety of plants and animals in their habitats, including micro-habitats · describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify different sources of food. ➡ Include concept of decomposition to complete cycle of life
Primary school 3	**Plants** · functions of roots, stem/trunk, leaves and flowers · explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant ✓ Soil supply nutrients · water transportation within plants · life cycle of flowering plant	**Animals, including humans** · identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food · skeletons and muscles	**Rocks** · different kinds of rocks · how fossils are formed · recognise that soils are made from rocks and organic matter ✓ Nature of soil (what soil is)
Primary school 4		**Animals, including humans** · simple functions of the digestive system in humans · the different types of teeth in humans and their functions · construct and interpret a variety of food chains, identifying producers, predators and prey.	**Living things and their habitats** · living things can be grouped in a variety of ways · use classification keys · change in environment and possible dangers to living things
Primary school 5	**Earth and space**	**Animals, including humans** · changes of humans with age	**Living things and their habitats** · life cycles of a mammal, an amphibian, an insect and a bird · life process of reproduction in some plants and animals
Primary school 6	**Evolution and inheritance**	**Animals including humans** · human circulatory system, the functions of the heart, blood vessels and blood · impact of diet, exercise, drugs and lifestyle · ways of nutrients and watertransported within animals.	**Living things and their habitats** · describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals · give reasons for classifying plants and animals based on specific characteristics.

✕ water cycle
✕ gas exchange
→maybe included in secondary school (stage 3) in relation to ecosystem study

Courses of study in Japan

Grade	Programme of study (Japan)				
1 / 2	**Life Environmental studies** (elementary studies of social studies and science) Recognition of the relationship of individuals and home, school society, and natural environment Recognition of oneself and one's possibilities and enhance motivation and confidence				
	Life Structure and function of organisms Continuity of life Relation of environment and organisms		**Earth** Internal and crustal movements of the earth Atmosphere and water circulation of the earth Earth and celestial movement		
Primary school 3	**Familiar insects and plants** · observation of familiar environment · glowth pattern and body structure of insects and plants ➡ Include soil and its habitants		**The sun and the ground** (sunny and shady spots, warm and wet spots)		
Primary school 4	**Structure and movement of the human body**	**Seasons and living things** · relationship between seasons and animal activities and plant growth	**The fate of rain water and state of the ground** · water runs from higher to lower · relation of soil grain size and seepage of water into ground	**Weather conditions** · air temperature · state of wate to vapor	**The moon and stars**
Primary school 5	**Germination, growth and fruition of plants** · nutrition in seeds · conditions of germination (water and air temperature) · growth and fruition (sunlight and fertilizer affect plant growth) · pollination ad fruition ➡ Soil supply nutrients	**Birth of animals** (different patterns)	**Function of runnning water** · function of erosion, transportation and sedimentation · size and shape of pebbles of upstream and downstream · heavy rain resulting increased speed and amount of running water		**Weather change**
Primary school 6	**Structure and functions of the human body**	**Nutrition of plants and pathway of water** · production of starch · pathway of water	**Living things and the environment** · relation of living things and air and water · Eat and to be eaten relation of animals · Human and environment ➡ Include concept of decomposition to complete cycle of life	**Formation and change of land** · composition of land such and gravels etc. · formationo of geological strata · change of land by volcanic eruptions and earthquakes	**The moon and the sun** (location, and shape of the moon) ➡ Include water cycle with stage in soil

✕ nature of soil
→should be included in early stage

Give us your opinion about universal soil education guideline!