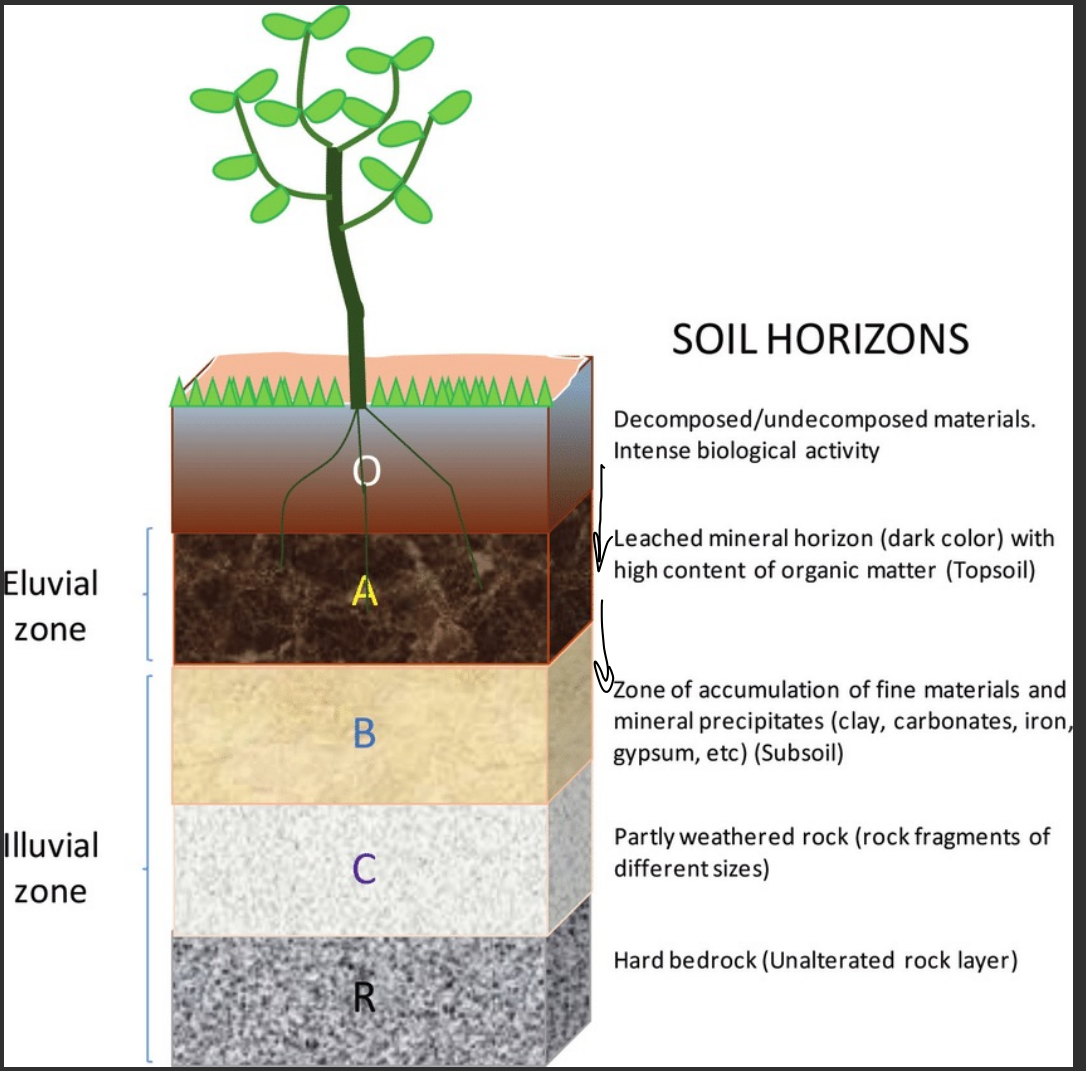
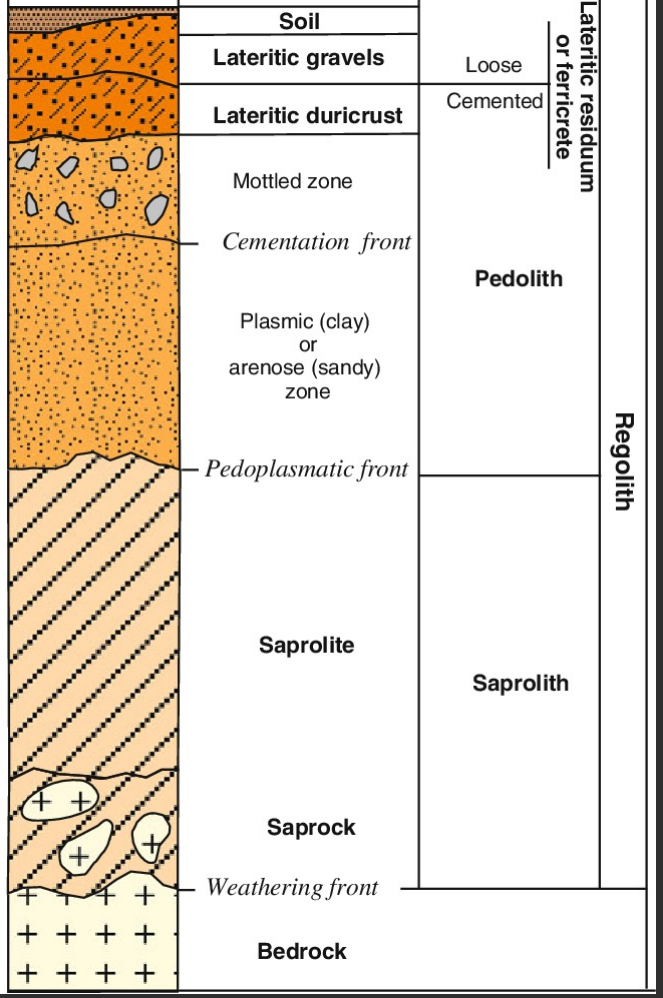
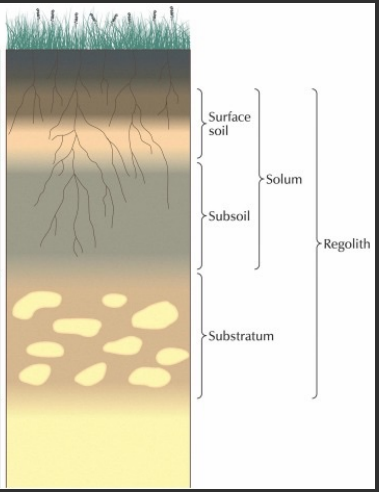
A brief clarification

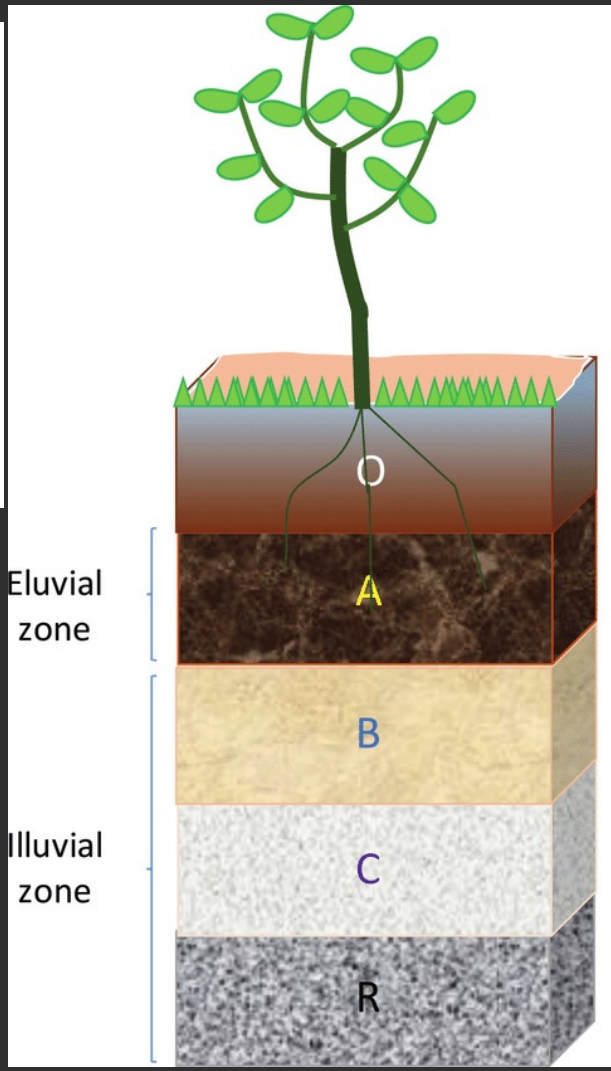
→ Then the quiz


SOIL HORIZONS
O
A
B
C
R
Eluvial zone
Illuvial zone
Decomposed/undecomposed materials. Intense biological activity
Leached mineral horizon (dark color) with high content of organic matter (Topsoil)
Zone of accumulation of fine materials and mineral precipitates (clay, carbonates, iron, gypsum, etc) (Subsoil)
Partly weathered rock (rock fragments of different sizes)
Hard bedrock (Unalterated rock layer)


Soil
Lateritic gravels
Lateritic duricrust
Mottled zone
Cementation front
Plasmic (clay)
or
arenose (sandy)
zone
Pedoplasmatic front
Saprolite
Saprock
Weathering front
Bedrock
Loose
Cemented
Lateritic residuum
or ferricrete
Pedolith
Saprolith
Regolith

Organic horizons	O1	Litter
	O2	Decomposed animal and plant remains
Mineral horizons (the solum, the upper part of which is the topsoil)	A	Humic horizon
	E	Eluvial horizon
	B	Illuvial horizon
Mineral horizon (substratum)	C	Unconsolidated material from which the solum may have been formed (sometimes called parent material). Part of the regolith
Consolidated bedrock	R	Largely unweathered rock





SOIL HORIZONS

Decomposed/undecomposed materials. Intense biological activity

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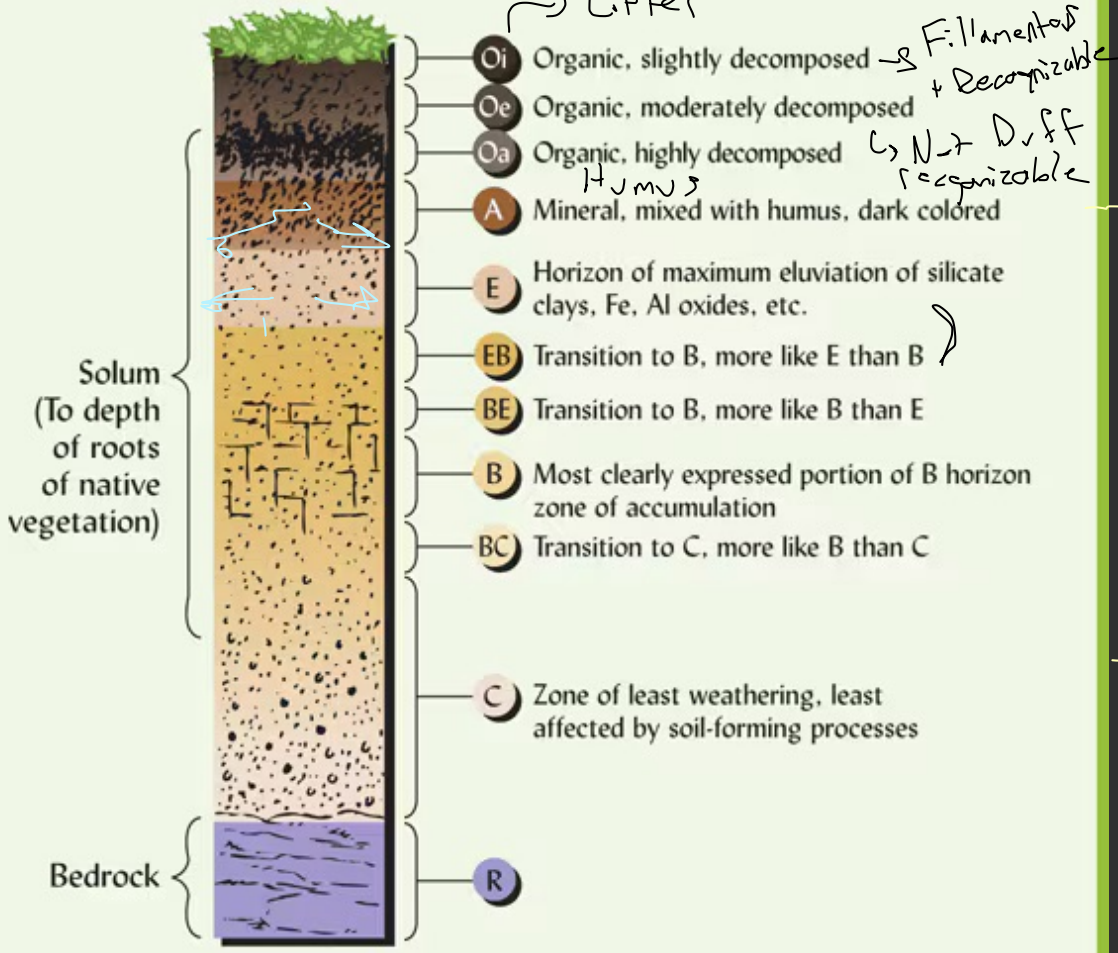
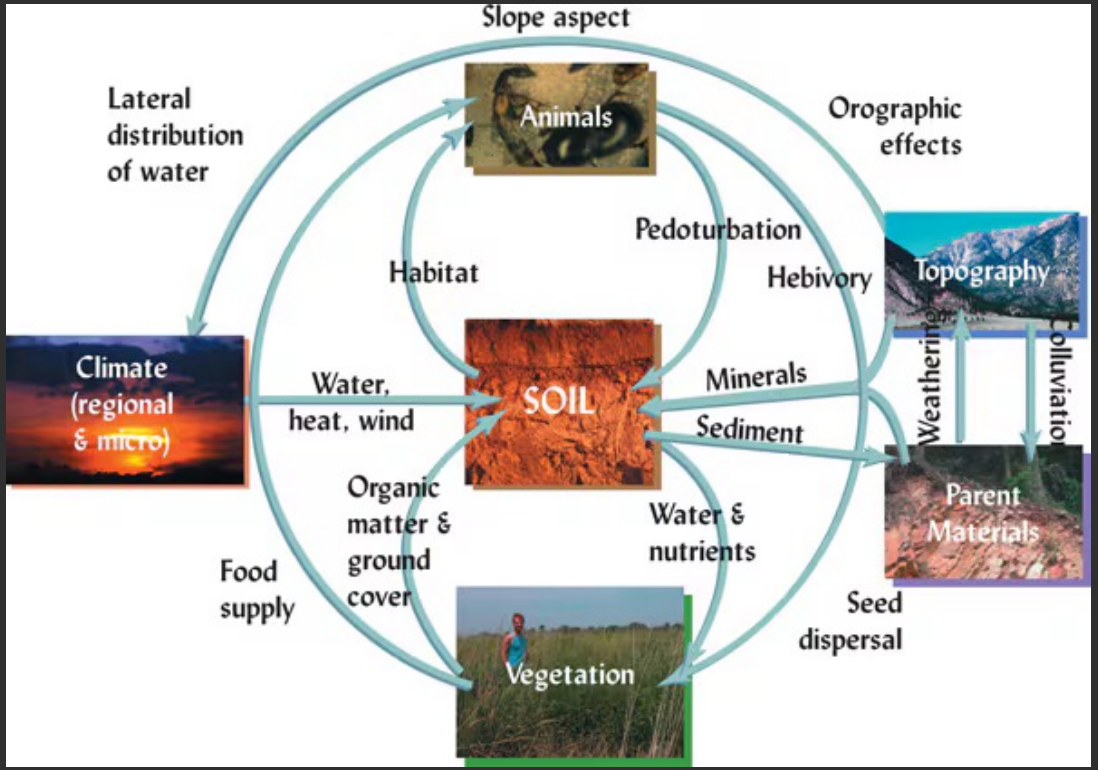
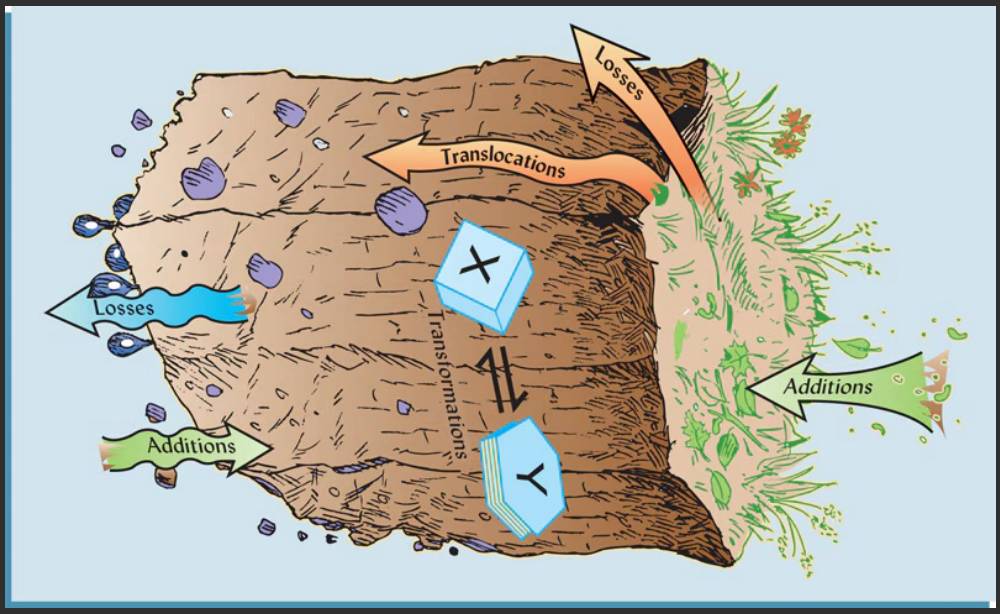
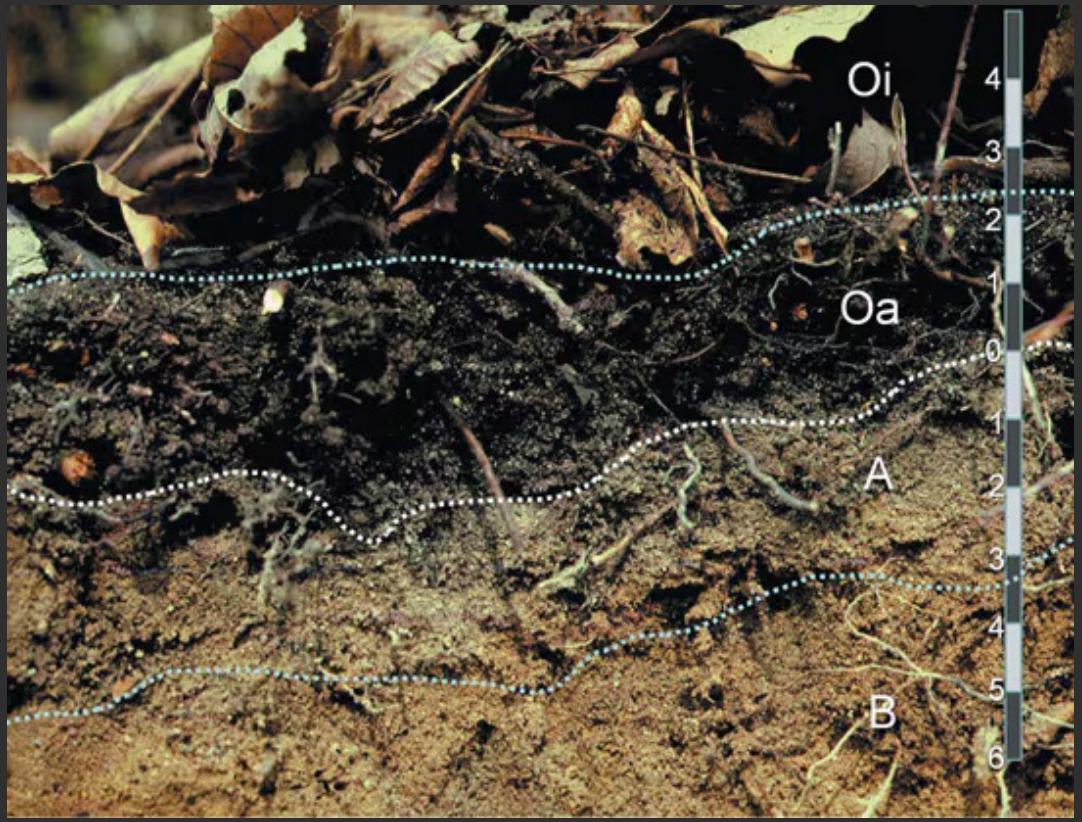
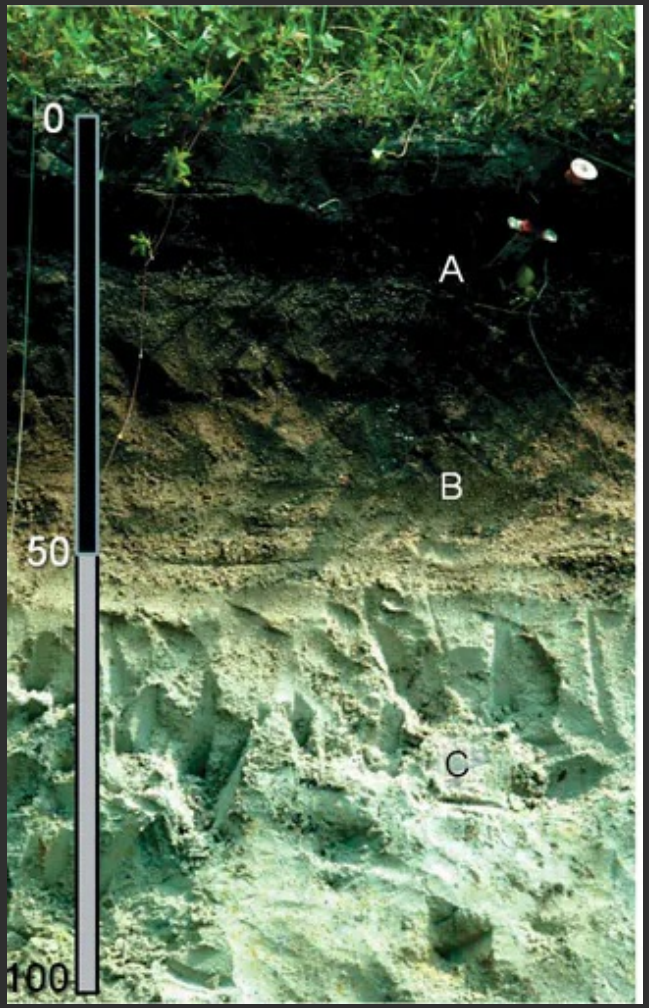
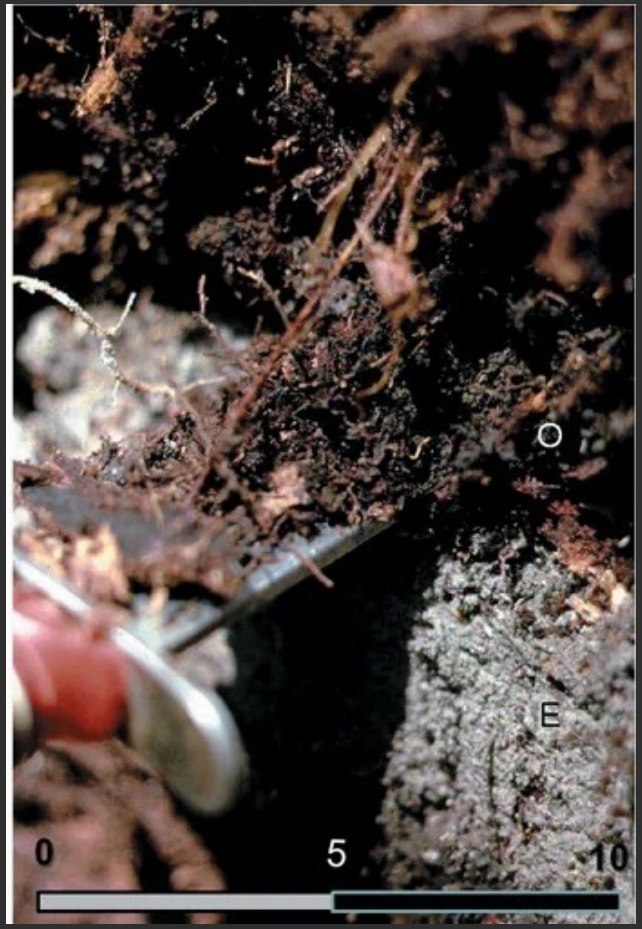

Litter
Oi Organic, slightly decomposed
Oe Organic, moderately decomposed
Oa Organic, highly decomposed
A Mineral, mixed with humus, dark colored
E Horizon of maximum eluviation of silicate clays, Fe, Al oxides, etc.
EB Transition to B, more like E than B
BE Transition to B, more like B than E
B Most clearly expressed portion of B horizon zone of accumulation
BC Transition to C, more like B than C
C Zone of least weathering, least affected by soil-forming processes
R
Solum (To depth of roots of native vegetation)
Bedrock
Subhorizons
Florest Floor
Top Soil
Mineral Soil
Available Water is


Slope aspect
Lateral distribution of water
Animals
Orographic effects
Pedoturbation
Habitat
Hebivory
Topography
Climate (regional & micro)
Water, heat, wind
SOIL
Minerals
Sediment
Weathering
Colluviation
Parent Materials
Organic matter & ground cover
Water & nutrients
Food supply
Seed dispersal
Vegetation


Losses
Translocations
Losses
X
Transformations
Y
Additions
Additions


Oi
Oa
A
B
4
3
2
1
0
1
2
3
4
5
6


0
A
B
50
C
100

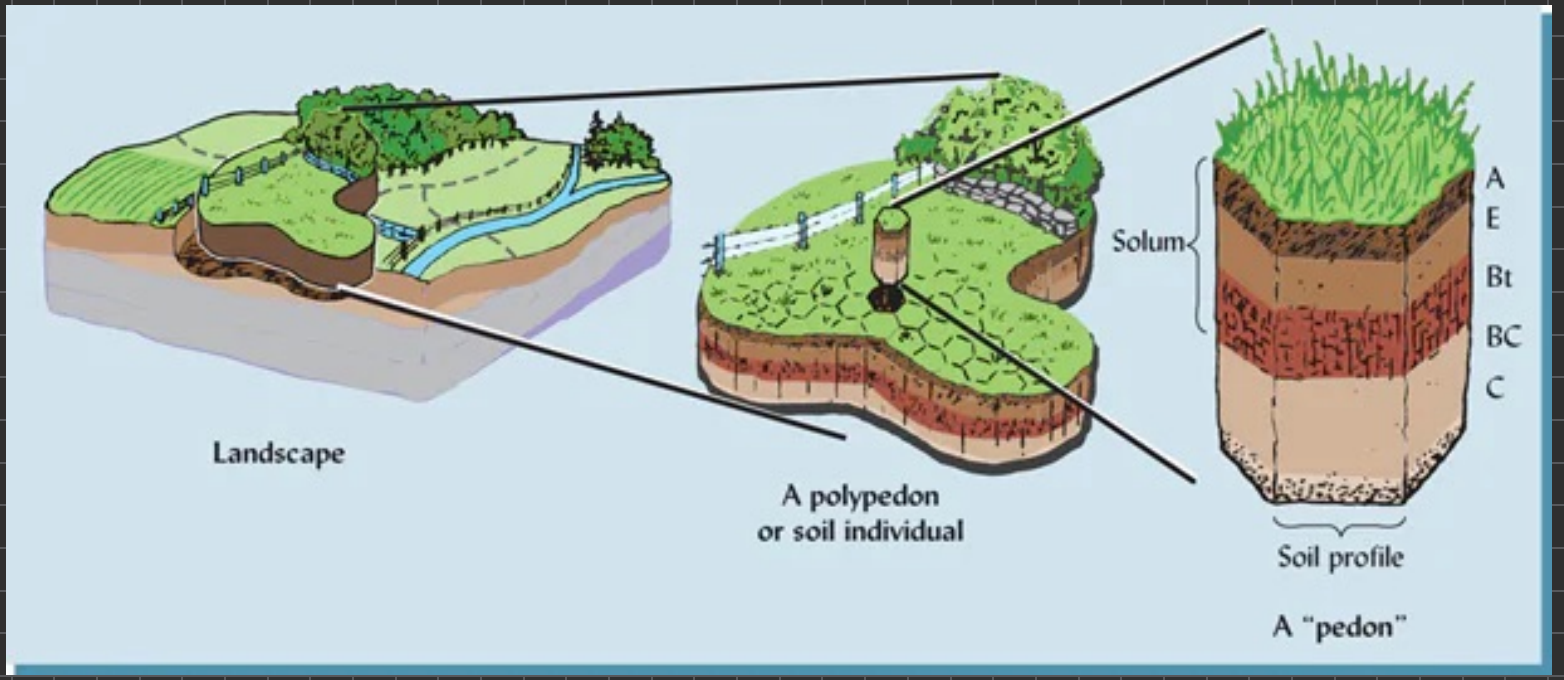


Typical

Coniferous

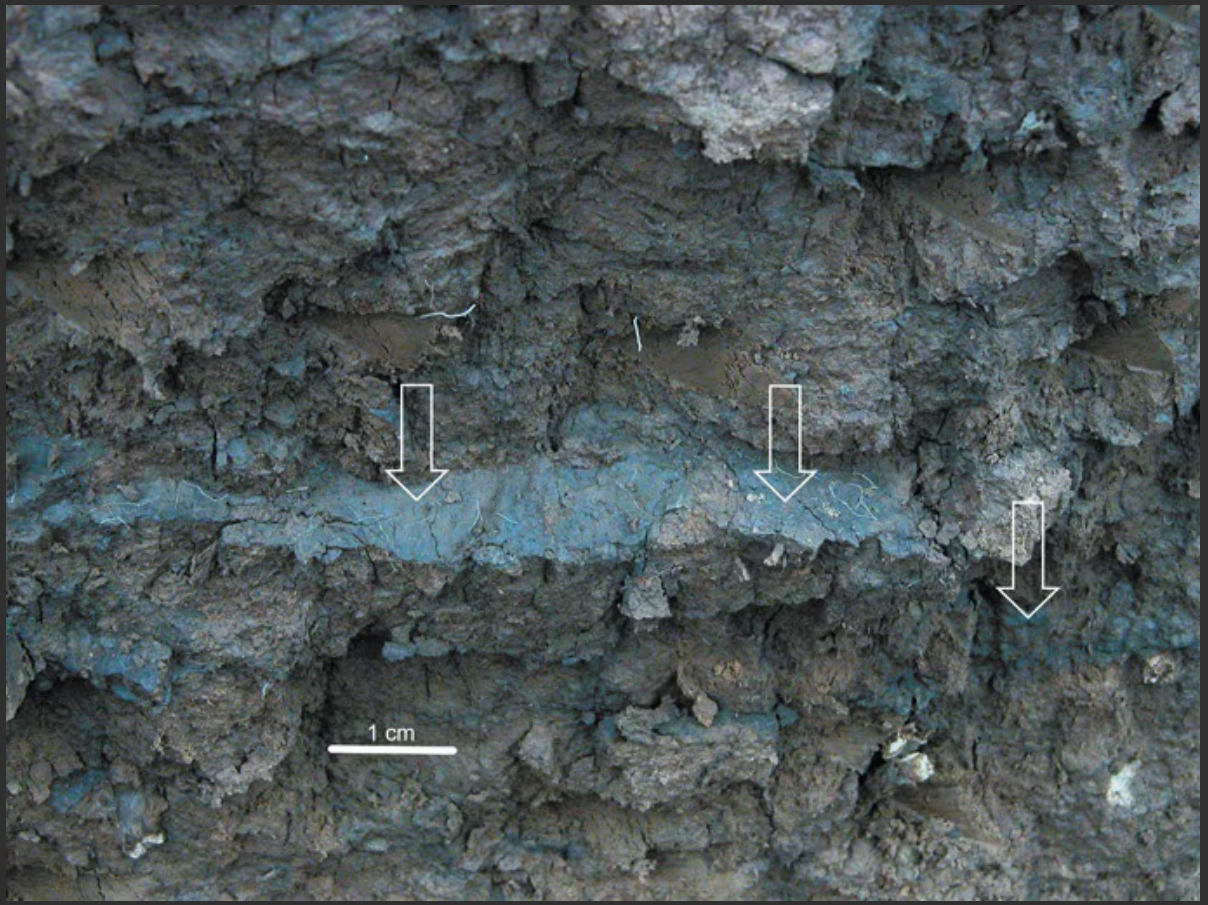
Soil

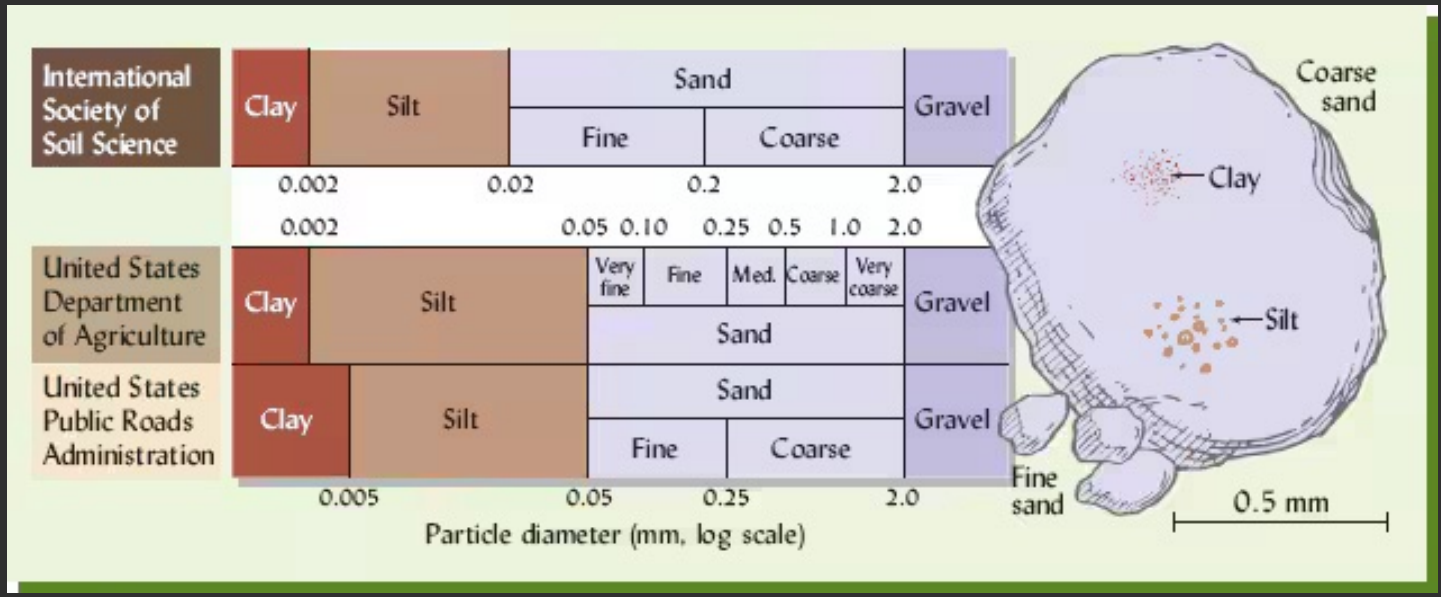

A
B1
B2
BC
C
Cr
R


Landscape
A polypedon
or soil individual
Solum
A
E
Bt
BC
C
Soil profile
A "pedon"

E horizon

O - Material accumulation





Soil Texture

→ Distribution of particle sizes within soil

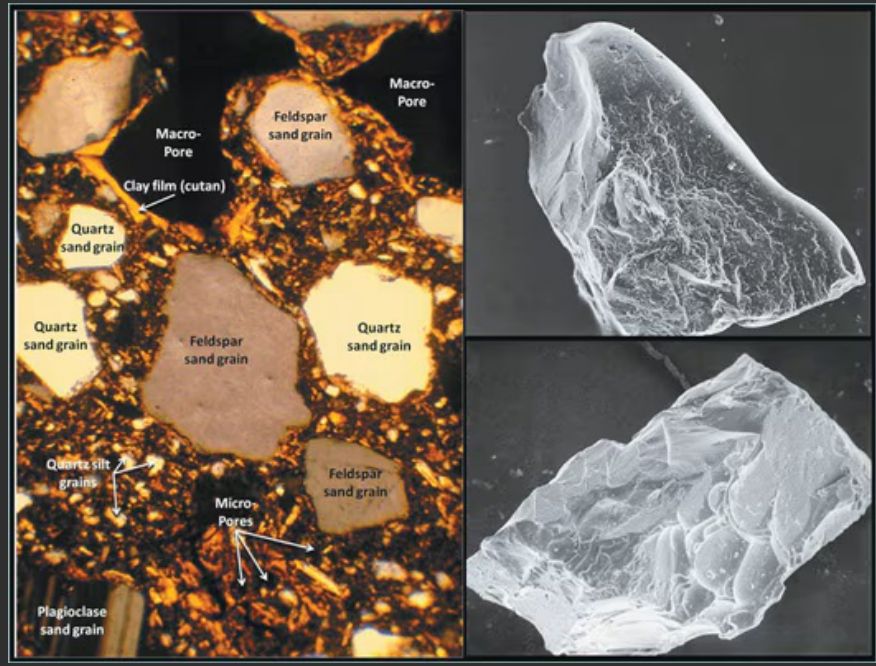
Sand SiO_2 Al_2

↑ quarty

↳ Decomposed

Minerals derived from rock fragment

↳ Rounded or angular



Gritty feel

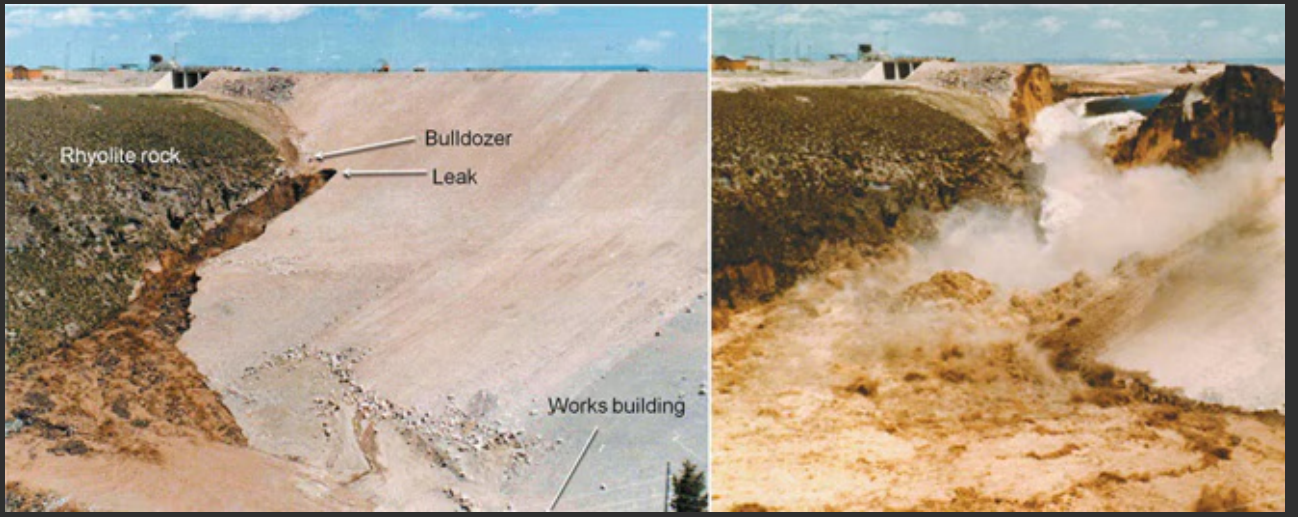
Specific Surface Area = low

Silt

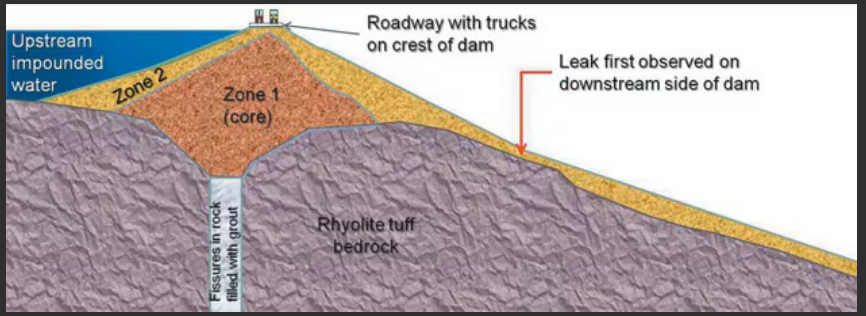
"Small Sand" → Similar composition as Sand, but more weathered.

Not visible to the naked eye.

- Smooth, like flour, lacks plasticity
- Higher specific SA → higher ability to release nutrients (lacks cohesion)
- High erosion potential
- Smaller pore spaces


Rhyolite rock
Bulldozer
Leak
Works building

Piping


Upstream impounded water
Zone 2
Zone 1 (core)
Roadway with trucks on crest of dam
Leak first observed on downstream side of dam
Fissures in rock filled with grout
Rhyolite tuff bedrock

Clay

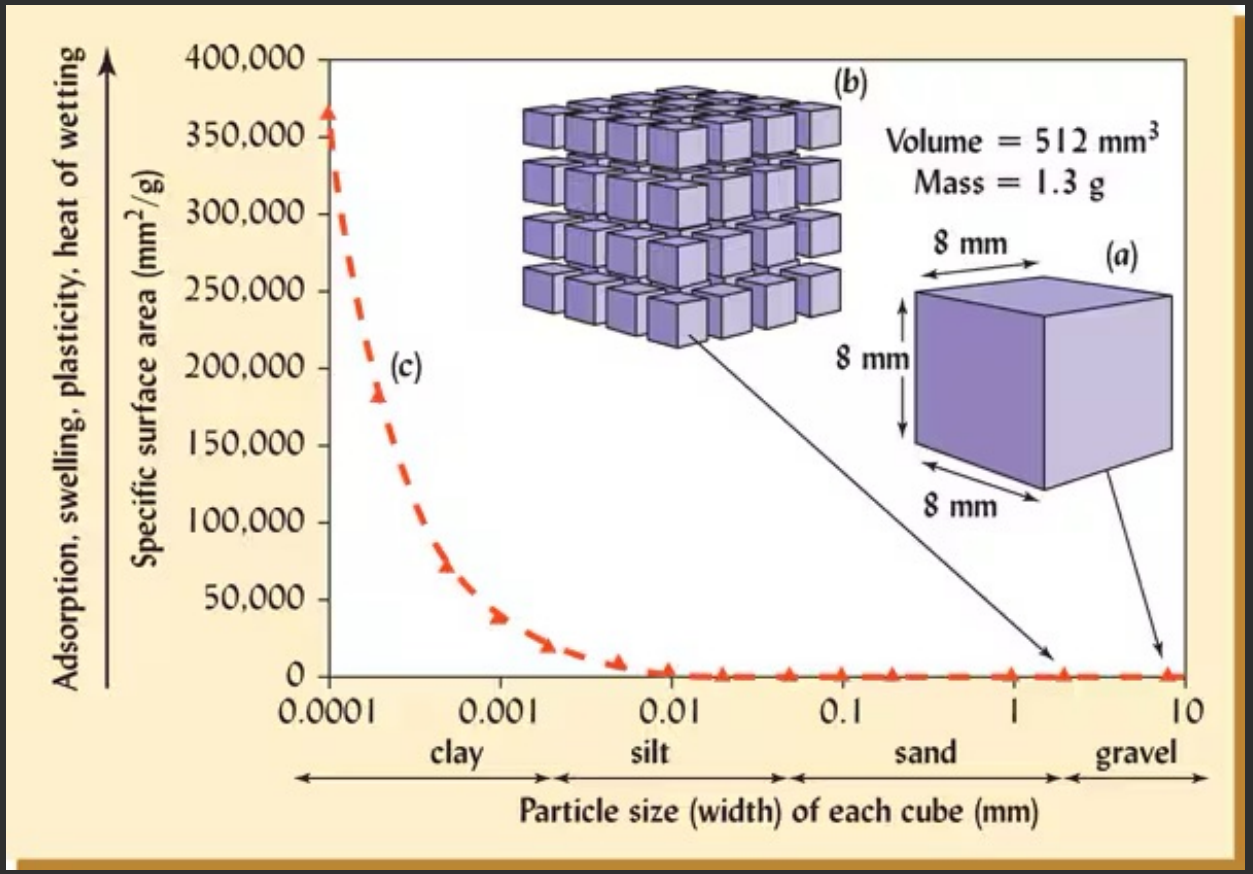
→ Chemically weathered minerals derrived from silt and sand particles

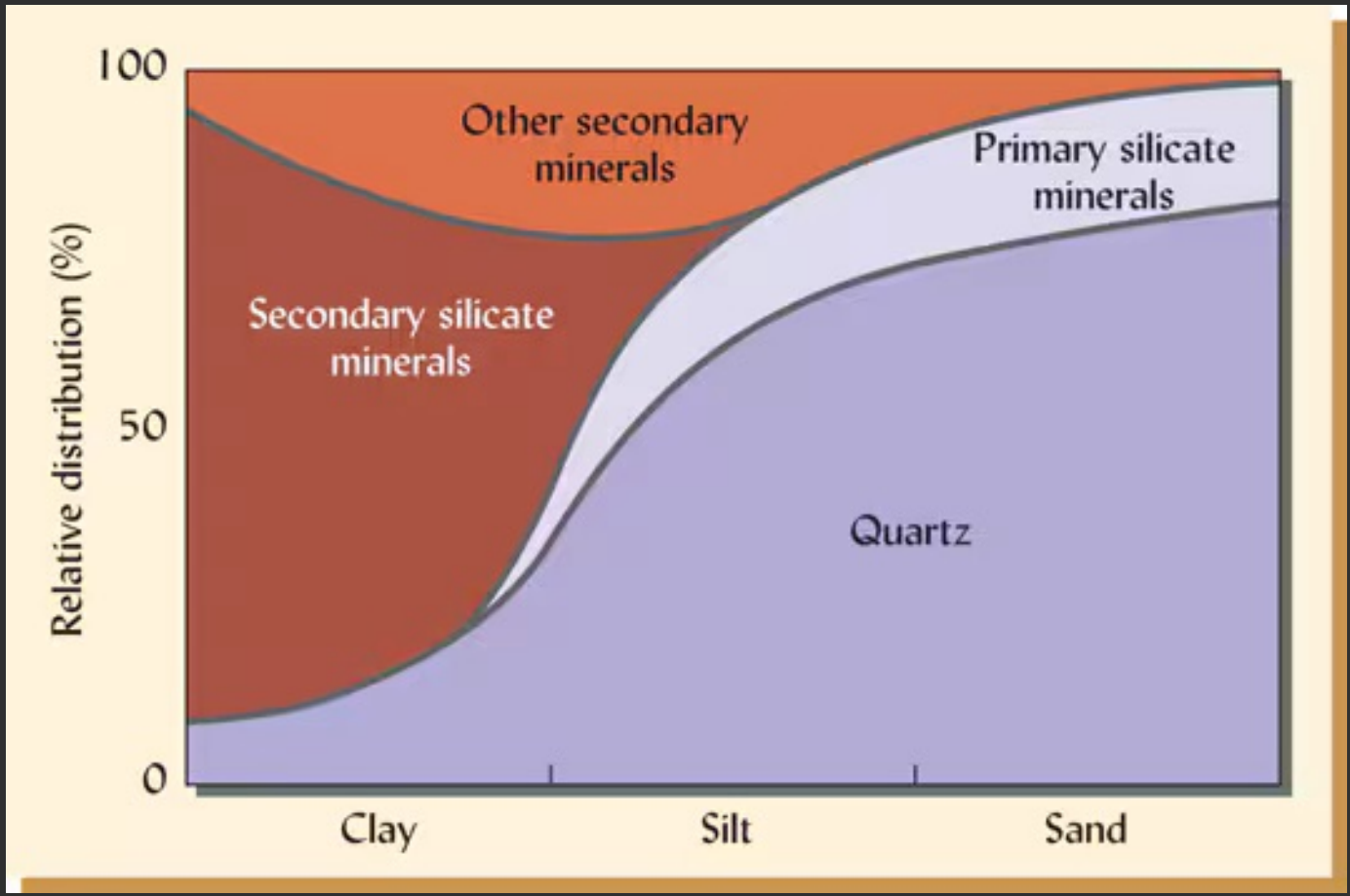
→ Very small; colloids, particles that can become fully suspended in solution

→ Very small pores

→ Very high specific SA, cohesion, plasticity

→ Very reactive with cations/anions, water


Adsorption, swelling, plasticity, heat of wetting
Specific surface area (mm²/g)
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
(b)
Volume = 512 mm³
Mass = 1.3 g
8 mm
(a)
8 mm
8 mm
(c)
0.0001
0.001
0.01
0.1
1
10
clay
silt
sand
gravel
Particle size (width) of each cube (mm)


100
50
0
Relative distribution (%)
Other secondary minerals
Primary silicate minerals
Secondary silicate minerals
Quartz
Clay
Silt
Sand