

The lithosphere: minerals and rocks

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CONCEPT REVIEW 24
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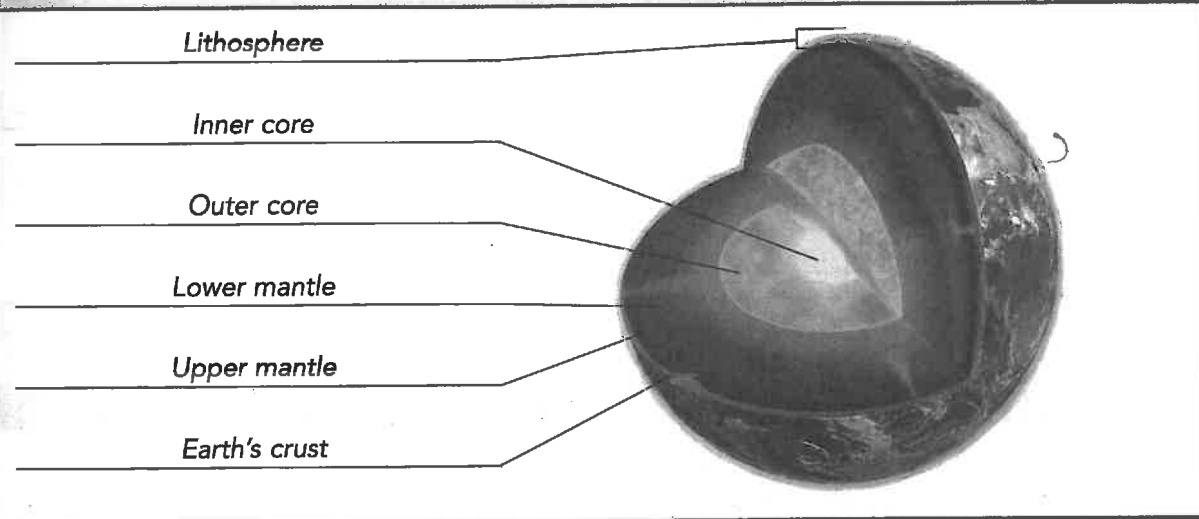
Definitions

The lithosphere is the hard shell of the Earth, consisting of the crust and the topmost part of the upper mantle.

Minerals are solid inorganic substances with clearly defined composition and properties.

Rocks are heterogeneous solids composed of many minerals.

Internal structure of the Earth



Some of the main minerals mined in Québec

Mineral	Possible uses
Gold	Jewellery, electronic equipment, trade
Copper	Pipes for plumbing, electronic equipment, electrical wire, construction (roofing)
Nickel	Stainless steel, magnets, coins
Iron	Steel manufacture

Distinctive features of minerals

- Inorganic substances
- Ordered atomic structure
- Unique chemical composition
- Exist naturally

Some physical properties of minerals

Property	Description
Colour	<p><u>Idiochromatic</u> minerals: The element that gives them their colour is part of their chemical composition.</p> <p><u>Allochromatic</u> minerals: The impurities they contain give them their colour.</p>
Transparency	<p>Property by which a mineral allows light to pass through it.</p> <p><u>Transparent</u>: Lets light pass straight through it.</p> <p><u>Translucent</u>: Lets light through, but it is impossible to see through it.</p> <p><u>Opaque</u>: Lets no rays through at all.</p>
Hardness	<p>Resistance to scratching according to the Mohs scale.</p> <p>(value from 1 to 10)</p>
Streak	<p>Powder trace obtained by rubbing the mineral on a surface of unglazed porcelain.</p>

Types of rock

Type of rock	Formation
Igneous rocks	<p>The result of the cooling of magma. <u>Extrusive</u> igneous rocks are formed on contact with the air.</p> <p><u>Intrusive</u> igneous rocks are formed before reaching the surface.</p>
Sedimentary rocks	<p>The result of accumulation and compaction of debris.</p>
Metamorphic rocks	<p>Former igneous or sedimentary rocks that have been transformed by heat or pressure.</p>

The lithosphere: soil

CONCEPT REVIEW 25
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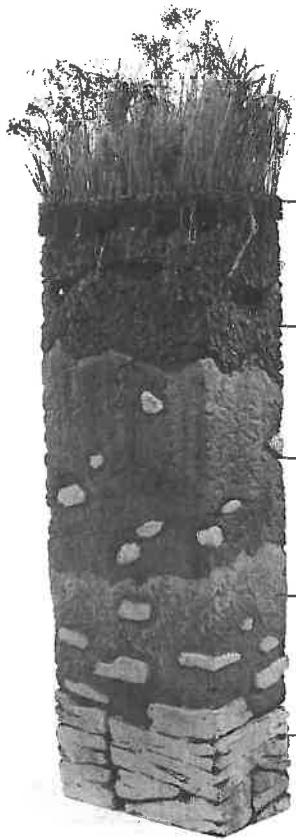
Definitions

Soil horizons are differentiated layers running roughly parallel to the surface of the ground.

A soil's buffering capacity is its ability to resist changes in its pH when acidic or alkaline compounds are added to it.

Permafrost is ground whose temperature has been 0°C or lower for at least two years.

Soil horizons



O Surface layer

A Topsoil

B Subsoil

C Fragmented parent rock

R Unaltered parent rock

Conditions necessary for soil to be fertile

1. A sufficient amount of minerals.
2. Adequate moisture.
3. An appropriate soil pH.



The lithosphere: energy resources

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Definitions

Fossil fuels result from the transformation of organic residue. These energy sources consist of oil, natural gas and coal.

Nuclear energy is the energy stored in the bonds between the particles in the nucleus of an atom.

Geothermal energy is the energy that comes from the internal heat of the Earth.

Soil depletion is the loss of soil fertility.

Contamination is the abnormal presence of a harmful substance in an environment.

Energy resources

Fossil energy	Renewable (R) or nonrenewable (NR)	Advantages	Disadvantages
Fossil energy	NR	Readily available	Emits pollutants: carbon dioxide, sulphur dioxide, nitrogen oxides and methane. All are responsible for acid rain and greenhouse gases
Nuclear energy	NR	Requires few resources for a large amount of energy - Generates few greenhouse gases	Risk of nuclear accidents Produces dangerous radioactive waste
Geothermal energy	R	It is renewable.	Installing it is too expensive