

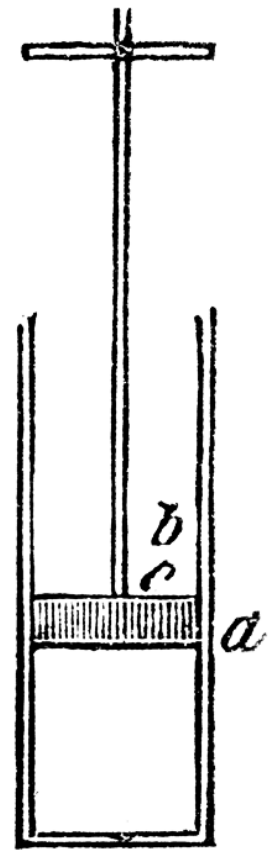
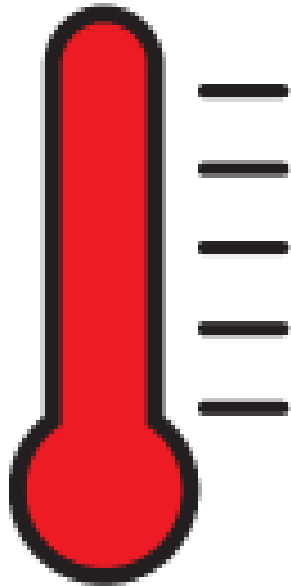
STATION #1

Compaction and Cementation



STATION #2

High Temperature and Pressure



STATION #3

Sediments



Examples:

Glacial deposits: gravel, sand, clay

River and lake deposits: gravel, sand, mud

Sand dunes

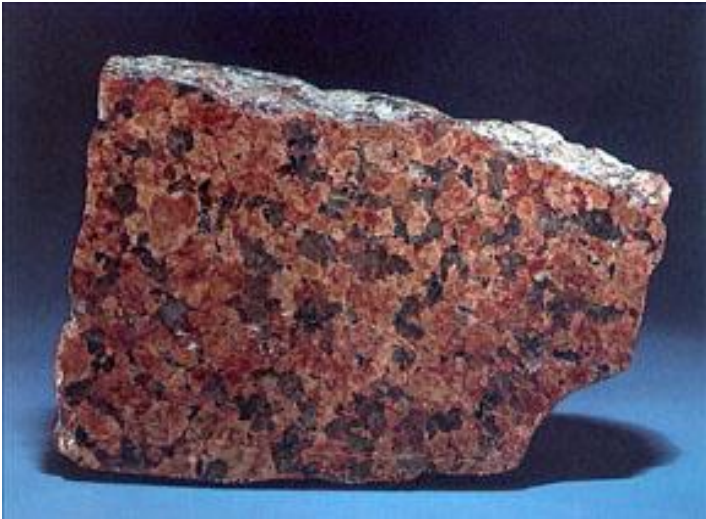
Soils

Peat

Saskatchewan Rock Kit # 24

STATION #4

Igneous Rock



Intrusive – Plutonic

Example: Wathaman Batholith

Saskatchewan Rock Kit #'s 7, 9, 13



Extrusive – Volcanic

Example:

Fort a la Corne Kimberlite

Amisk Volcano

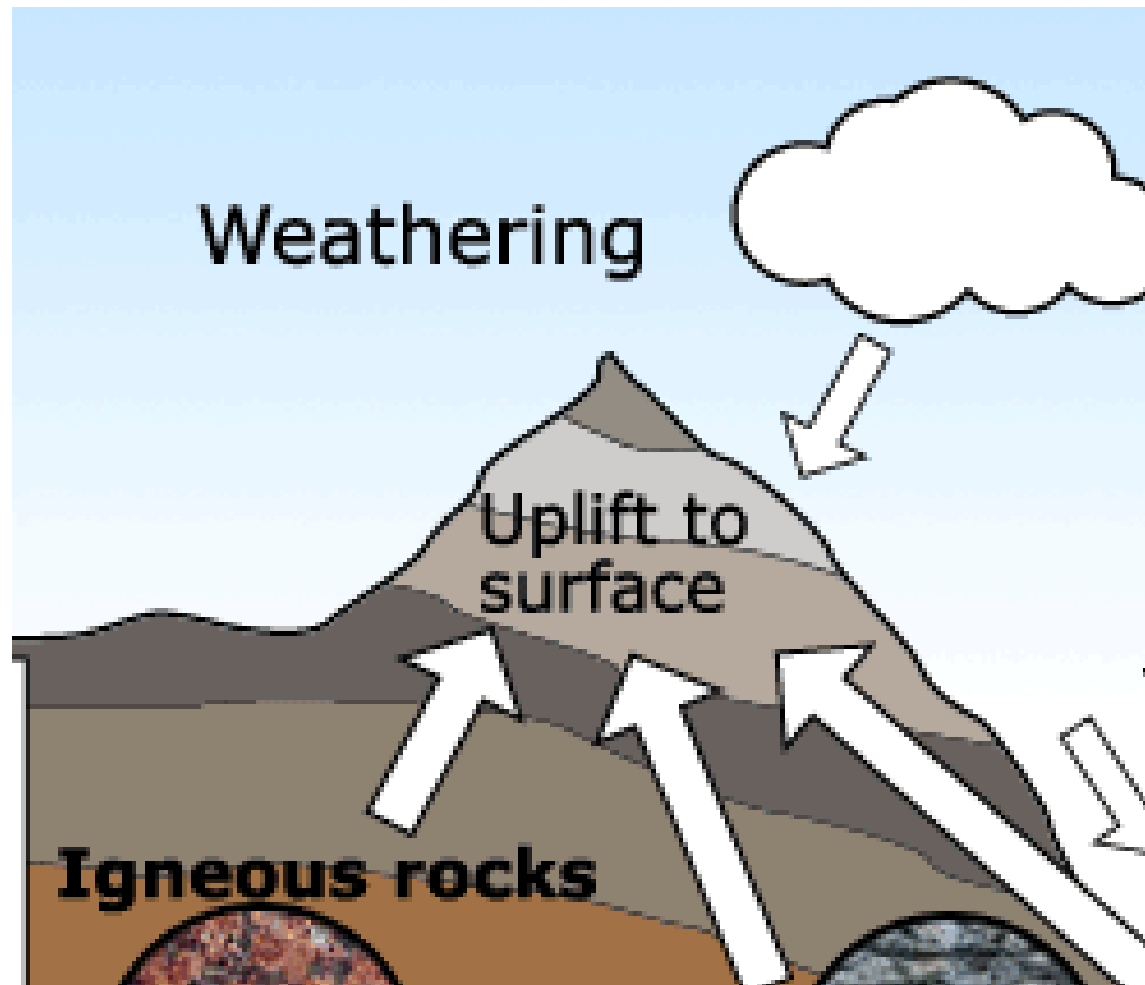
La Ronge Volcanic Belt

***Saskatchewan Rock Kit #'s
8, 17 & 18***



STATION #5

To The Surface



STATION #6

Metamorphic Rocks



Schist

Saskatchewan Rock Kit #21



Gneiss

Saskatchewan Rock Kit #22



Marble

Examples:

Wollaston Group: metamorphosed sedimentary rocks between the La Ronge Volcanic belt and Athabasca Basin.

STATION #7

Sedimentary Rocks



Examples:

Athabasca Basin Sandstone

Prairie Evaporite – potash
(Saskatchewan Rock Kit #1)

Ravenscrag coal
(Saskatchewan Rock Kit #3)

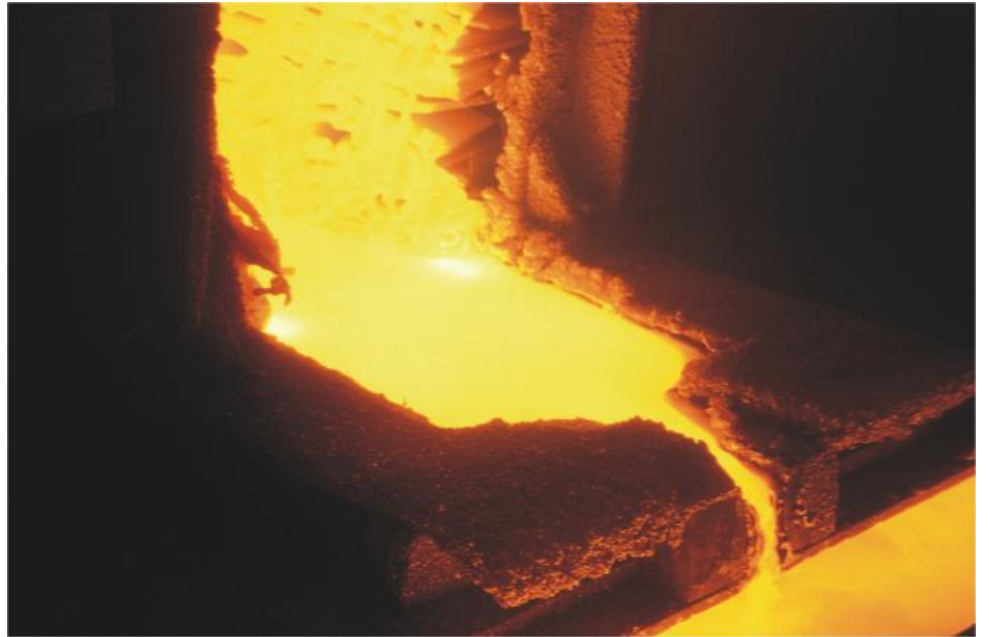


**Saskatchewan Rock Kit #'s 1,3,10, 11,
14, 24**



STATION #8

Melting



STATION #9

Cooling and Hardening (crystallization)



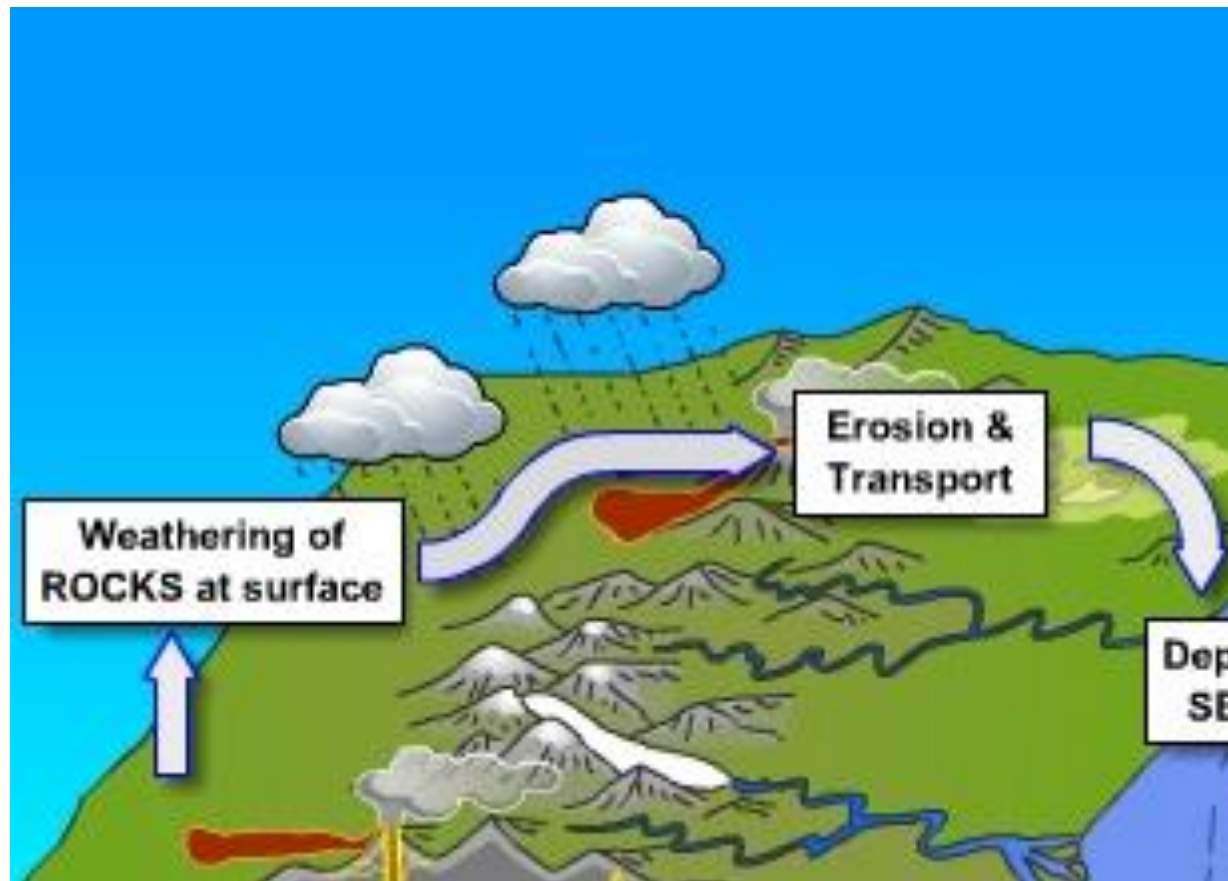
STATION #10

Magma



STATION #11

Weathering and Erosion



Saskatchewan Mineral Deposits

#2 High Temperature and Pressure

Gold: Earthquakes create fractures in rocks. Pressure drops in the fractures. As the earthquake shock waves pass through gold and silica rich hot water, in the fractures, the drop in pressure causes the dissolved material to come out of solution (think of how CO₂ gas comes out of solution when you open a can of pop) to form veins of quartz and gold.

Mines: Seabee (Claude Resources Inc.)

Roy Lloyd (Golden Band Resources Inc.)

Saskatchewan Rock Kit #23- Gold Ore

Saskatchewan Mineral Deposits

#1 Cementation & Compaction

Uranium: As the Athabasca Basin filled, sand and gravel was compacted and cemented into sandstone and conglomerate. At the same time, hot oxidizing water containing dissolved uranium migrated through the sediment. On mixing with reducing water from fault zones extending into the underlying metamorphosed sedimentary rocks, uranium precipitated near the unconformity at the base of the sandstone.

Mines: McArthur River, Eagle Point (Cameco)

Cigar Lake (Cameco & Areva)

Saskatchewan Mineral Deposits

Copper-Zinc: When magma rich in copper and zinc reacts with hot seawater containing dissolved sulphur, copper and zinc sulphide minerals will crystallize as the magma cools, forming sulphide-rich layers or zones within the volcanic rock.

Mines: Triple 7 mine at Flin Flon, MB; past-producing mines at Creighton, SK (HudBay Minerals Inc.) ***Saskatchewan Rock Kit # 6 Copper and Zinc Ore***

Potash: When warm potash rich brines are brought to the surface and left to cool in ponds during the winter months, the potash crystallizes out of solution.

Mines: Belle Plaine (Mosaic); Patience Lake (Potash Corp)

Saskatchewan Mineral Deposits

Diamond: Diamonds form at extremely high pressure and temperature very deep within the earth. Magma rising from these depths to build volcanoes may carry diamonds up towards the surface.

Example: Fort a la Corne (Shore Gold Inc.) *Saskatchewan Rock Kit #4. Kimberlite*

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Rare Earth Elements (REEs): As magmas crystallize, elements that cannot easily fit into crystal structures because of their large size or electron charge (chemical valence) are concentrated in the magma. REEs (i.e., La to Lu, plus Sc & Y) are concentrated this way. When the enriched magma finally crystallizes, a REE deposit may result.

Example: Hoidas Lake deposit (Great Western Minerals Group Ltd.)

Saskatchewan Mineral Deposits

Diamonds: Diamonds form at extremely high pressure and temperature very deep within the earth. Magma rising from these depths to build volcanoes may carry diamonds up towards the surface. The igneous rocks diamonds are found in are called kimberlites.

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Sulphate Lakes: Ground water brings sodium and magnesium to the surface and is deposited into internally drained lakes. As evaporation occurs in the summer months the sodium and magnesium become concentrated and precipitate as sodium or magnesium sulphate crystals.

Mines: Chaplin Lake (Saskatchewan Minerals Inc.); Big Quill Lake (Big Quill Lake Resources) *Saskatchewan Rock Kit #15*

Saskatchewan Mineral Deposits

Graphite: Carbon in organic-rich sedimentary rock is recrystallized during high pressure and temperature metamorphism to form graphite.

Example: Deep Bay deposit (Noble Bay Mining Development Inc.)

Saskatchewan Mineral Deposits

Potash: The potash deposits are sedimentary rocks that formed when potash and other evaporite minerals crystallized as the waters of the sea were evaporating.

Mines: Esterhazy, Rocanville, Belle Plaine, Vanscoy, Cory, Colonsay, Allen, Lanigan, Patience Lake ***Saskatchewan Rock Kit # 1***

Deposits: K+S, Jansen

Uranium Deposits: The uranium occurs in sandstones of the Athabasca Basin. The sand and gravel that filled the basin was eroded from a mountain range in northeastern Saskatchewan about 1750 million years ago.

Mines: Rabbit Lake, Key Lake, Cigar Lake (Cameco)
McLean Lake, Sue (Areva)

Coal Deposits: About 65 million years ago, parts of southern Saskatchewan were covered by swamps near the edge of a shallow sea that covered much of the interior of North America. Thick accumulations of peat were buried by sand and transformed by heat and pressure into lignite, or brown coal.

Mines: Poplar River, Boundary Dam, Bienfait (Sheritt Coal) ***Saskatchewan Rock Kit #3***

Saskatchewan Mineral Deposits

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Mines: Chaplin Lake (Saskatchewan Minerals Inc.); Big Quill Lake (Big Quill Lake Resources) ***Saskatchewan Rock Kit # 15***

Silica Sand Deposits: The silica sand deposits are composed of very well rounded quartz grains. The sand forms due to continuous wave action in a beach environment.

Mine: Hanson Lake Mine (Preferred Sands Ltd.)

Saskatchewan Mineral Deposits

Sand and Gravel Deposits: The last glaciation deposited great quantities of sand, gravel and clays over most of Southern Saskatchewan (south of La Ronge).

Clay Deposits: Large volumes of feldspar-rich sediment has been transported by river systems over a short-distance . The feldspars altered to the clay mineral kaolinite during weathering.

Mines: Gollier Creek Mine (Whitemud Resources Ltd.)
Claybank- Past Producing

Saskatchewan's Mineral Deposits:

Sand and Gravel Deposits: The last glaciation deposited great quantities of sand, gravel and clay over most of Southern Saskatchewan (south of La Ronge).

Silica Sand Deposits: The wave action during time of deposition of the sands has rounded the quartz (silica) grains and has helped to erode or clean any other bits of rock or minerals from these deposits.

Mine: Hanson Lake Mine (Preferred Sands Ltd.)