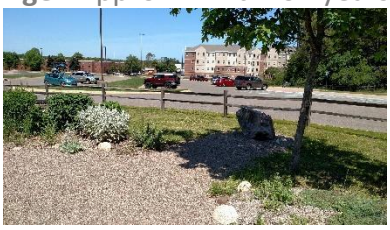
OLA GeoPark Rock Specimens

A.

Compeau Creek Gneiss
Type: Metamorphosed intrusive igneous rock
Description: An intrusive igneous rock that has been metamorphosed to varying degrees. This rock unit is evident north of Marquette in the vicinity of Sugarloaf Mountain, and in the Republic area along portions of highway M 95.
Minerals: Quartz, orthoclase feldspar, amphibole
Age: Approx. 2.7 billion years



B.

Gabbro (unknown rock unit name)
Type: Intrusive igneous rock
Description: Dark colored, medium-grained igneous rock. Gabbro is the intrusive chemical equivalent of basalt. (Basalt is an extrusive igneous rock commonly erupted from volcanoes.)
Minerals: Plagioclase feldspar, augite (a clinopyroxene), olivine
Age: Unknown for this sample



C.

Konna Dolomite
Type: Metamorphosed sedimentary rock
Description: Calcareous sediments containing magnesium, deposited in mid-depth ocean waters, that were later metamorphosed to become dolostone. The Kona varies from being thinly bedded to massive, and some horizons contain stromatolites—fossilized mounds of algae. Portions of the Kona have been silicified (replaced with quartz).
Minerals: Dolomite ($CaMgCO_3$)
Age: Approximately 2.3 billion years



D.

Red Granite
Type: Intrusive igneous rock (unknown rock unit name)
Description: Red granite has a reddish/pinkish hue in part because of the presence of the alkali feldspars microcline and orthoclase. Granite is typically massive, meaning that it does not have layering, bedding, or preferred mineral orientation.
Minerals: Quartz, alkali feldspar, and trace amounts of amphibole and/or mica
Age: Unknown for this sample



E.

Gabbro
Type: Intrusive igneous
Description: This specimen from the Eagle Mine contains low grade sulfide ore deposits. It was deposited as a sill where rising magma exploited weaknesses in pre-existing formation. Metal (and iron) rich hydrothermal fluids deposited high-grade nickel ore within/adjacent to sill.
Minerals: Chalcopyrite (fools gold) and pendlandite (lighter gold) minerals can be seen on the surface of the specimen.
Age: Unknown for this sample
Donated by Eagle Mine



F.

Kona Dolomite
Rock name: Chemical limestone
Rock type: Sedimentary, Chemical
Description: Deposited in mid to shallow seas as calcium carbonate precipitated out of solution, and were interbedded with blue-green algal mats known as stromatolites.
Age: ~ 2 billion years


G.

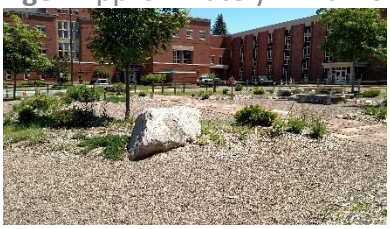
Mesnard Quartzite

Type: Metamorphic rock

Description: Quartzite is metamorphosed sandstone. Typically, quartz-rich beach sands become lithified to form sandstone; subsequent metamorphism produces quartzite. Quartzite may show original bedding, or it may be massive.

Minerals: Quartz, with trace amounts of feldspar and, locally, metal.

Age: Approximately 2.4 billions years



H.

Bell Creek Gneiss

Type: Metamorphic rock

Description: Gneiss is used to describe medium- to coarse-grained, foliated metamorphic rocks that formed under relatively high temperature and pressure. The Bell Creek Gneiss is quite old, and varies from being foliated to nearly massive. The parent material of the Bell Creek is likely a granitic, intrusive igneous rock.

Minerals: Quartz, feldspar, amphibole, mica

Age: Approximately 2.7 billion years


I.

Banded Iron Formation
Type: Sedimentary rock that, in this case, has been subsequently metamorphosed
Description: A banded rock consisting of layers of chemically deposited iron oxides and quartz (in the form of shales or cherts). At the time of deposition the Earth's atmosphere was reducing/very low oxygen (versus the oxidizing atmosphere we now enjoy). Under these conditions iron flowed like water and combined with the limited oxygen. BIF is believed to have been deposited in shallow ocean water along continental shelves.
Minerals: Quartz, hematite, magnetite
Age: Approximately 2.0 billion years


J.

Bell Creek Gneiss
Type: Metamorphic rock
Description: Gneiss is used to describe medium- to coarse-grained, foliated metamorphic rocks that formed under relatively high temperature and pressure. The Bell Creek Gneiss is quite old, and varies from being foliated to nearly massive. The parent material of the Bell Creek is likely a granitic, intrusive igneous rock.
Minerals: Quartz, feldspar, amphibole, mica
Age: Approximately 2.7 billion years



K.

Kona Dolomite
Type: Metamorphosed sedimentary rock
Description: Calcareous sediments containing magnesium, deposited in mid-depth ocean waters, that were later metamorphosed to become dolostone. The Kona varies from being thinly bedded to massive, and some horizons contain stromatolites—fossilized mounds of algae. Portions of the Kona have been silicified (replaced with quartz).
Minerals: Dolomite ($CaMgCO_3$)
Age: Approximately 2.3 billion years


L.

Jacobsville Sandstone
Type: Sedimentary rock
Description: Part of the Bayfield Group. Deposited in nearshore environments on top of the mid-continental rift deposits. The Jacobsville is typically reddish (due to oxidation of iron impurities), but in some areas the red staining contains white, bleached patches caused by iron redox processes.
Minerals: Quartz, feldspar, iron, and iron impurities.
Age: Between 1.1 billion years and 540 million years