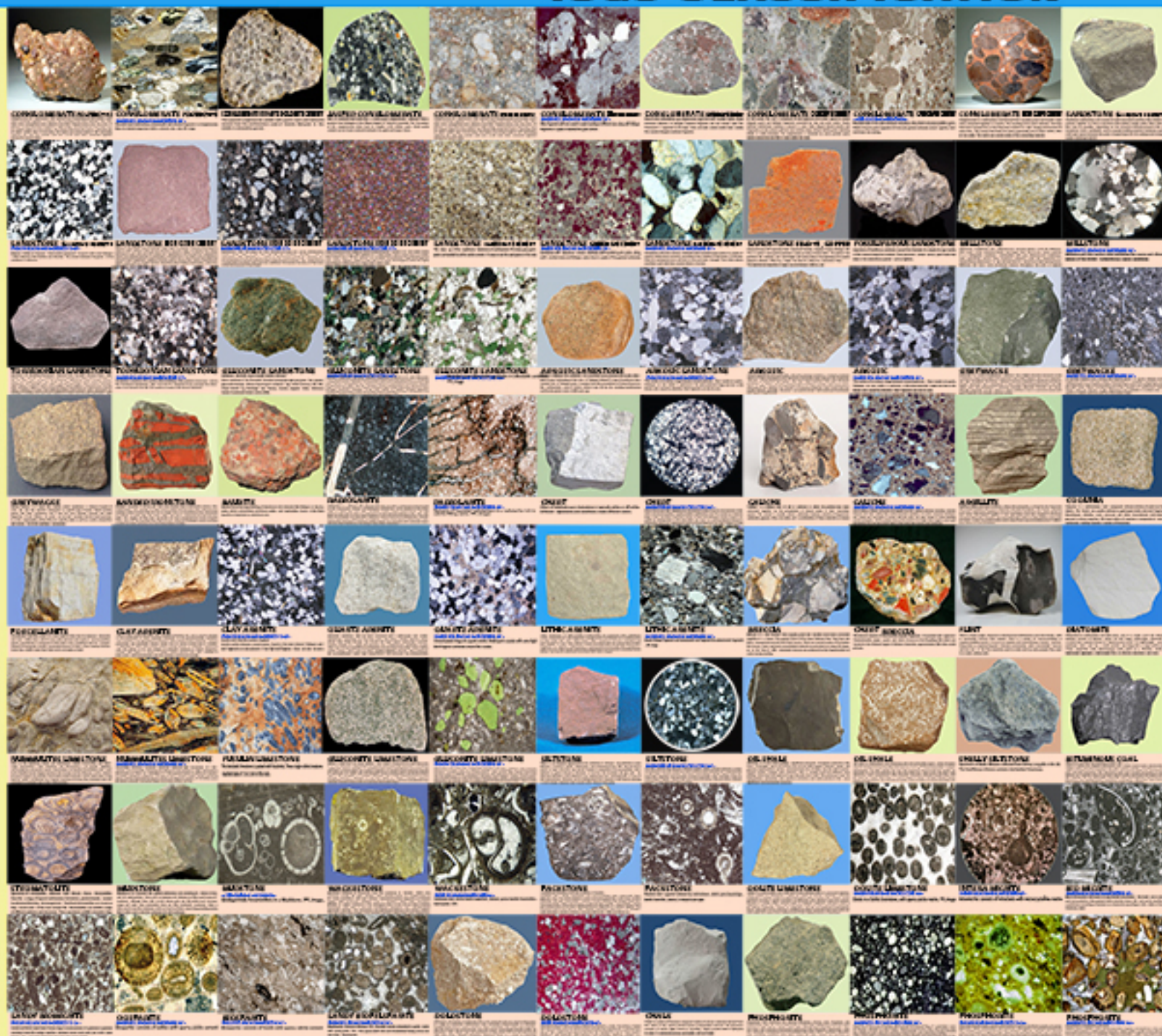


IDENTIFYING & INTERPRETING SEDIMENTARY ROCKS

IUGS CLASSIFICATION



What are sedimentary rocks?

Sedimentary rocks are formed from pre-existing rocks or pieces of once-living organisms. They form from deposits that accumulate on the Earth's surface. Sedimentary rocks often have distinctive layering or bedding. Many of the picturesque views of the desert southwest show mesas and arches made of layered sedimentary rock.

Common Sedimentary Rocks:

Common sedimentary rocks include sandstone, limestone, and shale. These rocks often start as sediments carried in rivers and deposited in lakes and oceans. When buried, the sediments lose water and become cemented to form rock. Tuffaceous sandstones contain volcanic ash.

Clastic Sedimentary Rocks:

Clastic sedimentary rocks are the group of rocks most people think of when they think of sedimentary rocks. Clastic sedimentary rocks are made up of pieces (clasts) of pre-existing rocks. Pieces of rock are loosened by weathering, then transported to some basin or depression where sediment is trapped. If the sediment is buried deeply, it becomes compacted and cemented, forming sedimentary rock. Clastic sedimentary rocks may have particles ranging in size from microscopic clay to huge boulders. Their names are based on their clast or grain size. The smallest grains are called clay, then silt, then sand. Grains larger than 2 millimeters are called pebbles. Shale is a rock made mostly of clay, siltstone is made up of silt-sized grains, sandstone is made of sand-sized clasts, and conglomerate is made of pebbles surrounded by a matrix of sand or mud.

Biologic Sedimentary Rocks:

Biologic sedimentary rocks form when large numbers of living things die. Chert is an example for this type of rock, and this is one of the ways limestone can form. Limestone can also form by precipitating directly out of the water.

SANDSTONE NOMENCLATURE AND CLASSIFICATION

The Pettigrew sandstone classification combines texture criteria, the proportion of muddy matrix, and lithological criteria, the percentages of the three constituent components of sandstone: quartz, feldspar and lithic fragments. The triangular plot has these three components as the end members to form a Q, F, L triangle, which is commonly used in clastic sedimentology. The Pettigrew classification of sandstone, often referred to as a *Toblerose* plot (Pettigrew 1973).



Classification of sandstones according to (A) McBride (1963) and (B) Folk et al. (1970). In Folk's classification, chert is included with rock fragment at the pole, and granite and gneiss fragment and included with lithic at the F pole. Silt = sandstone, Sil = shale, CRF = calcareous rock fragment, SRF = sedimentary rock fragment, MRF = igneous rock fragment, MRF = metamorphic rock fragment. (A) from McBride, E.F., 1963, A classification of common sandstones. J. Sediment. Res. 33, 1-16. (B) from Folk, R.L., 1970, Sedimentary rock classification and nomenclature for use in New Zealand. New Zealand J. Geol. 13, 1-16.