Can Rocks Change Your Life?

Rocks

Big rocks into pebbles,
Pebbles into sand.
I really hold a million, million
Rocks here in my hand.

Florence Parry Heide

The Rock Cycle in LCHS Nebraska

- Rocks are solid objects formed from mineral pressed tightly together or magma.
- Mixture of minerals, mineraloids, glass, organic matter

Weathering & erosion

- Weathering is breaking things down
  - Ice wedging
  - Abrasion
- Erosion is moving things after they are broke down
  - Wind
  - Water

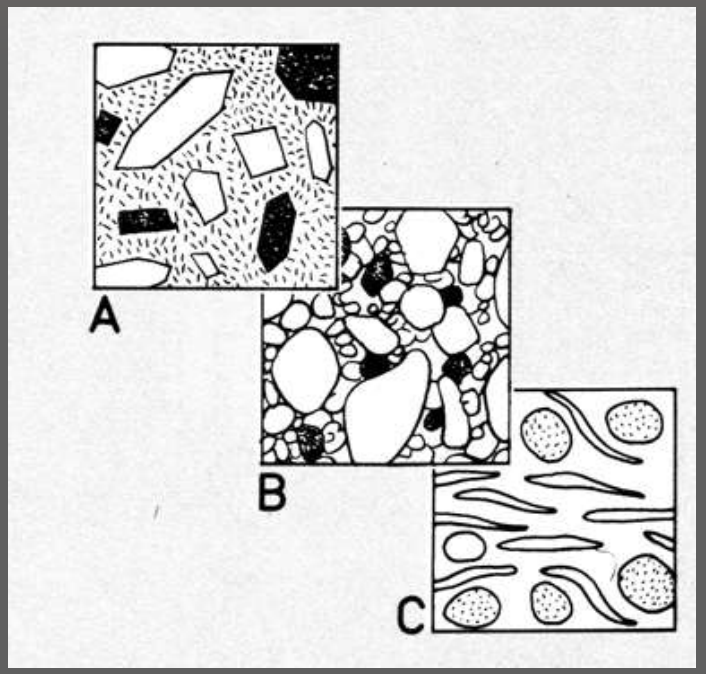
Rocks

There are three main types of Rocks

A. Igneous Rocks

B. Sedimentary Rocks

C. Metamorphic Rocks

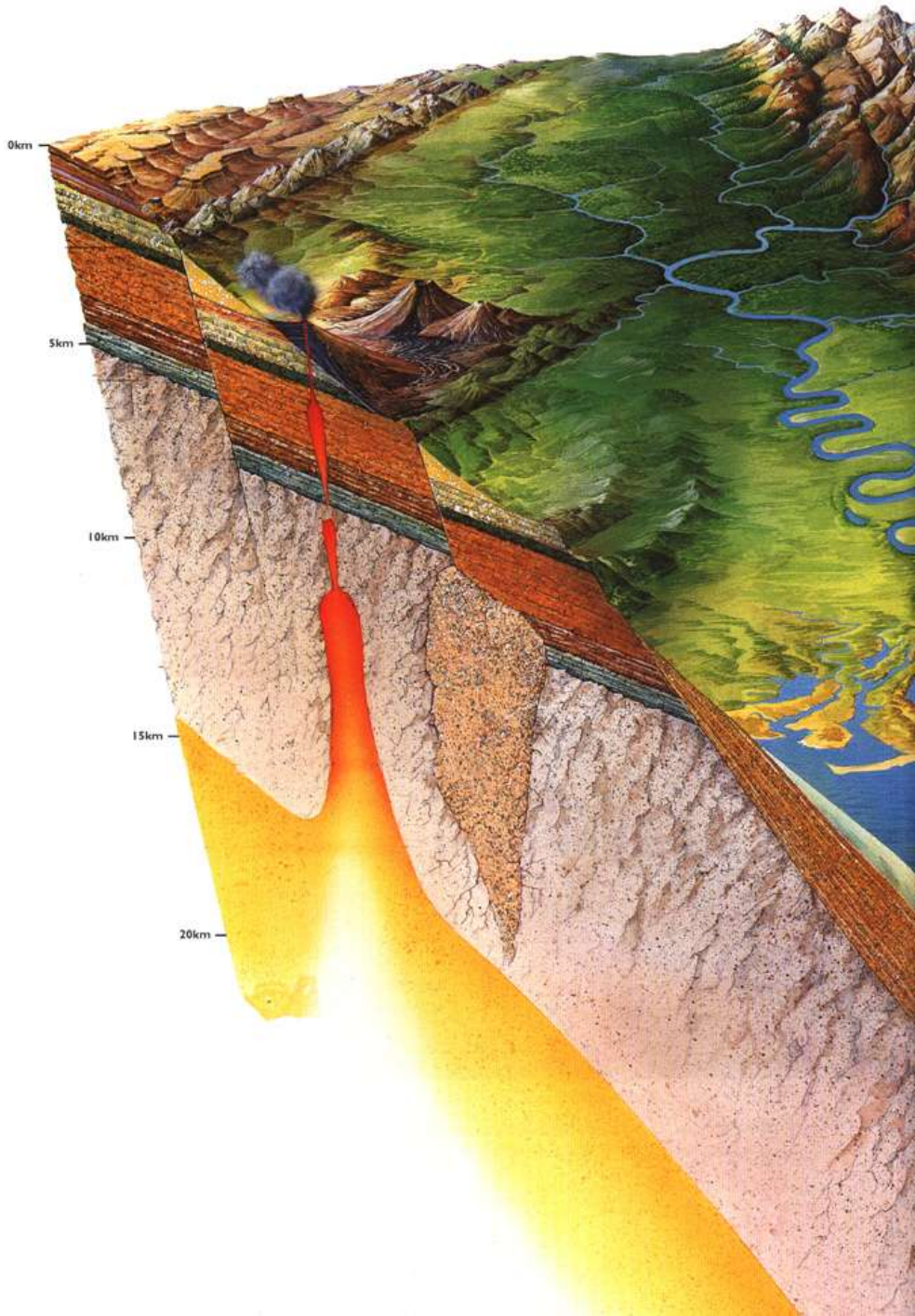


Each type of rock is formed in different locations and tell us a lot about the processes that have happened in the past.

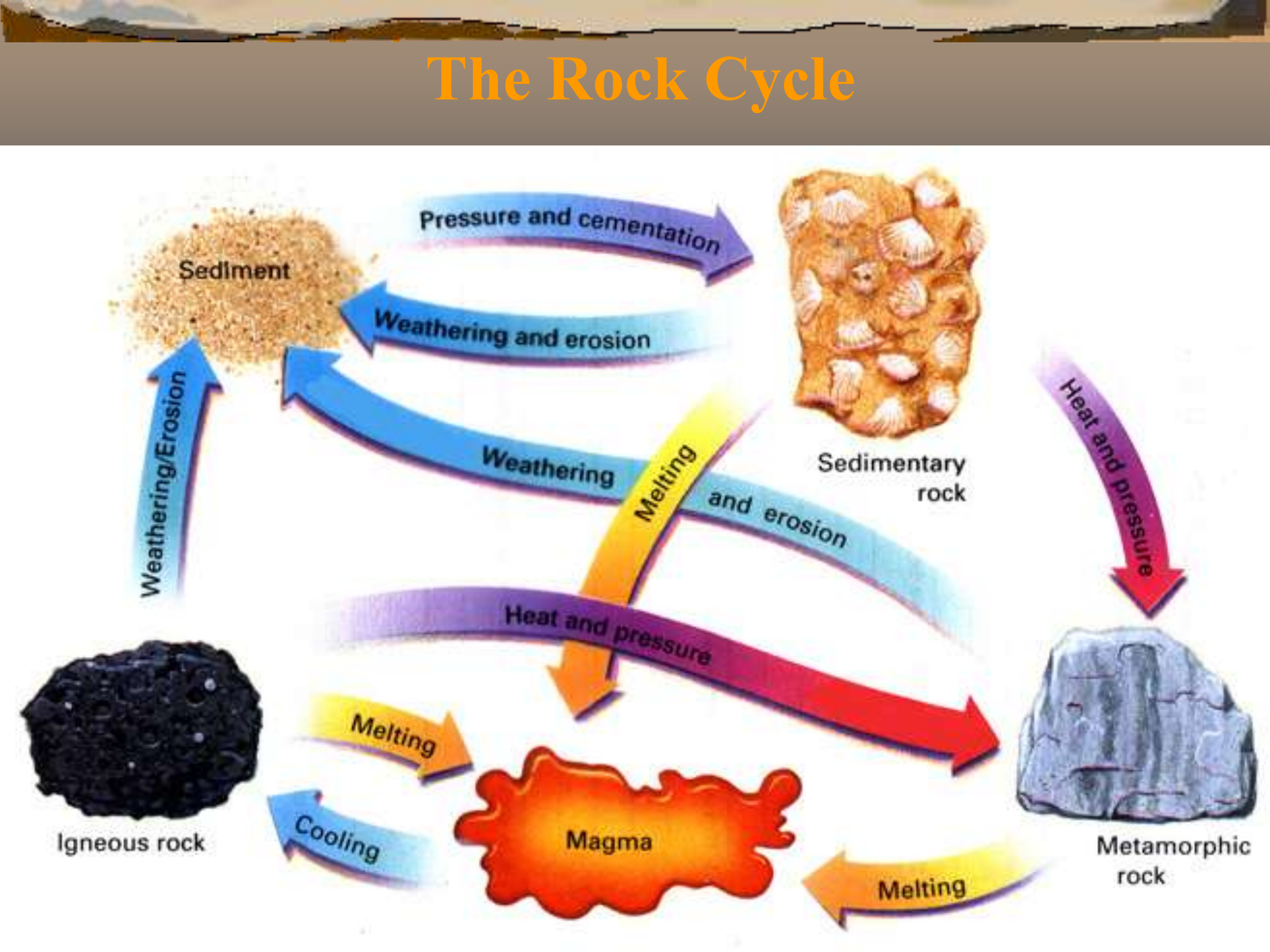
Rock formation occurs in the lithosphere.

Different rocks form in different locations

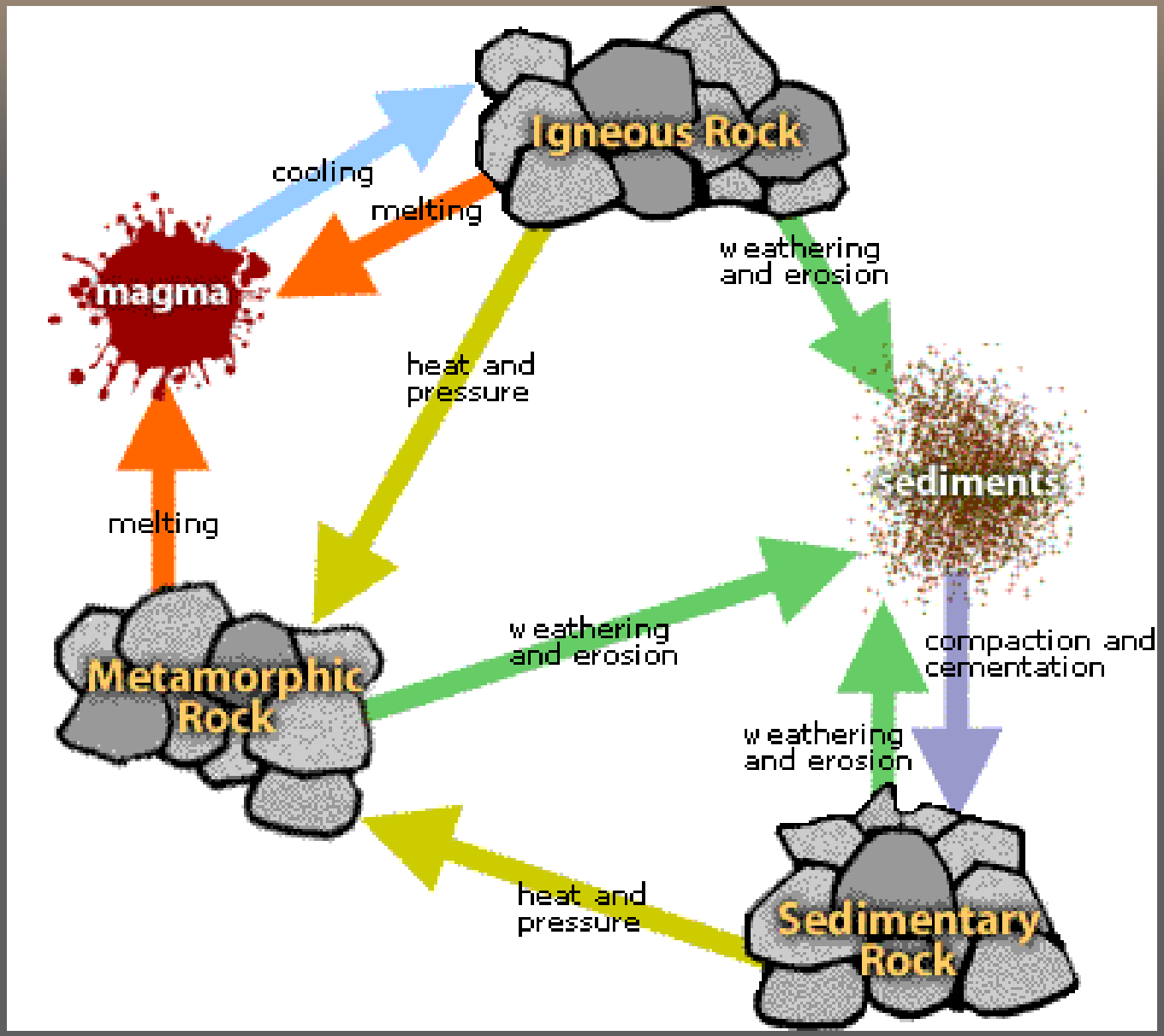
A rock on the surface may have once been 20 km underground.



The Rock Cycle



The Rock Cycle



Be able to draw and label *

Know the three main types of rocks and be able to give an example of each.*

- Igneous Rock
- Metamorhic
- Sedimentary

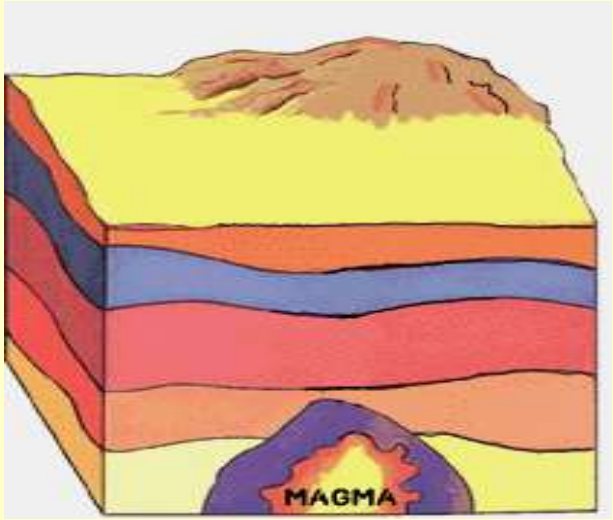
Types of Rocks

Igneous Rocks

Metamorphic Rocks

Sedimentary Rocks

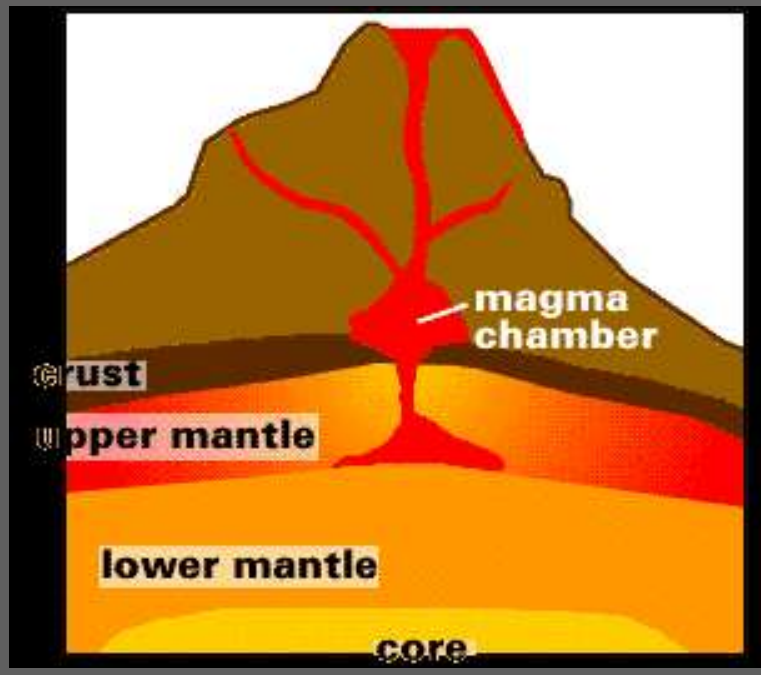
Igneous Rocks
What are They?



- Fire Rocks
- Formed underground by trapped, cooled magma
- Formed above ground when volcanoes erupt and magma cools

Igneous Rock

- Rock formed from molten material from a volcano.
- Magma - molten rock under the earth's surface. *
- Lava - when magma reaches the earth's surface it is lava. *

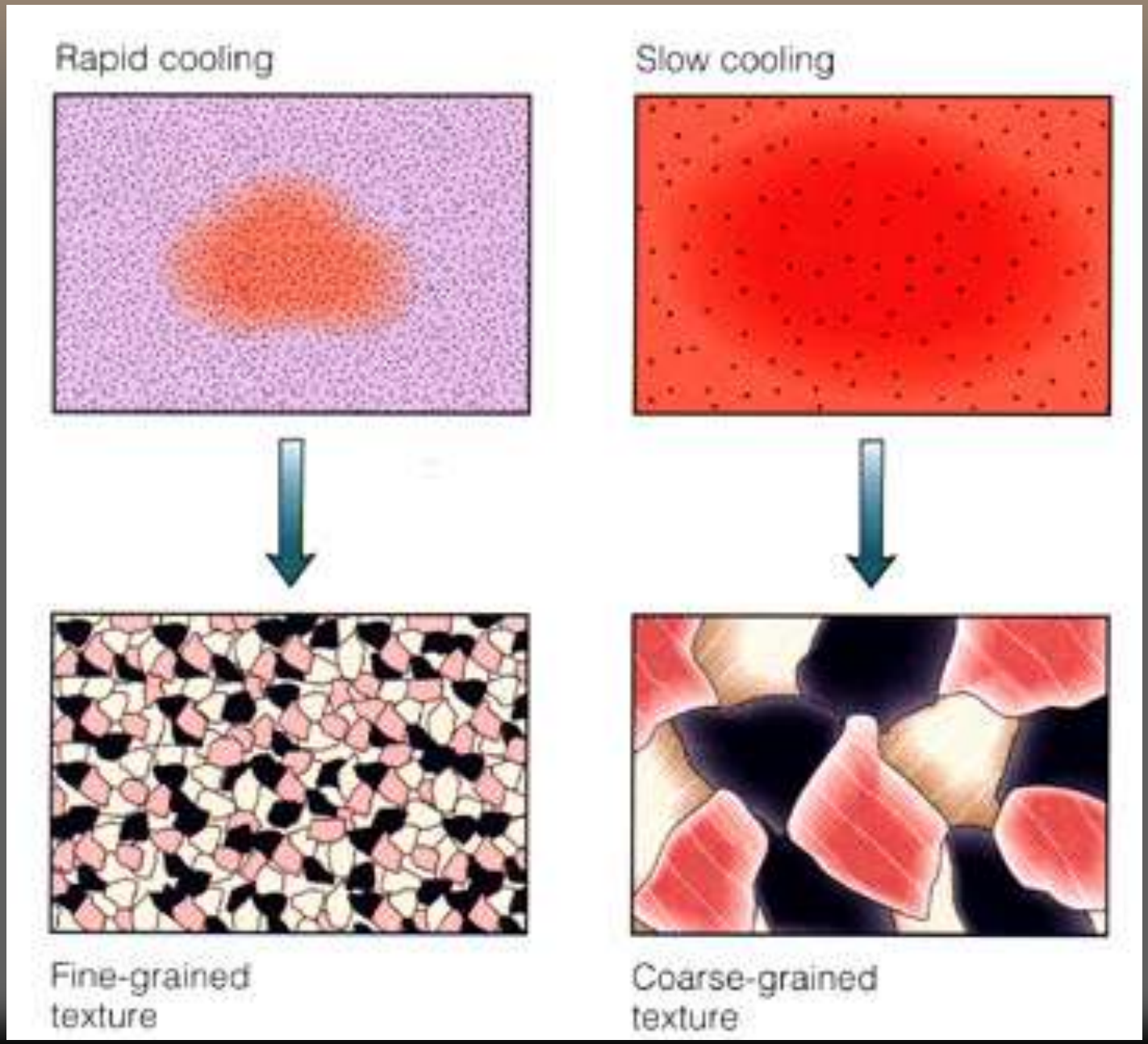


Types of Igneous Rocks

- Intrusive rocks - rocks that form below the earth's surface *
  - Tend to have large mineral grains *
- Extrusive rocks – when lava cools on or near the surface *
  - Fine Grain texture *

Extrusive (volcanic)

Intrusive (plutonic)



Types of Igneous Rocks

Granite

Scoria

Pumice

Obsidian

Igneous Rock

Igneous rock comes from cooled magma and lava. What are some names of igneous rock?

(a)

(b)

(c)

(d)

Three groups of igneous rocks *

- Basaltic
- Andesitic
- Granitic

Basaltic *

- Dense heavy dark colored rocks that form from basaltic magma which is rich in iron and magnesium. Volcanoes in Hawaii have basaltic lava flows
  - Intrusive
    - Gabro
  - Extrusive
    - Basalt
    - Scoria

Basalt

- Dark-colored, fine-grained, extrusive
- Formed where lava erupted onto surface
- Most widespread igneous rocks

Gabbro

- Dark-colored, coarse-grained intrusive
- Similar composition to basalt—plagioclase feldspar with some pyroxene and olivine

Andesitic *

- have mineral compositions between granitic and basaltic. Volcanoes in the Pacific Ocean are andesitic.
  - Intrusive
    - Diorite
  - Extrusive
    - Andesite

Granitic *

- Granitic rocks are light colored rocks of a lower density than basaltic rocks.
  - Intrusive
    - Granit
  - Extrusive
    - Rhyolite
    - pumice
    - Obsidian

Granite

- Light-colored, coarse-grained, no pattern
- Mostly quartz, feldspar, mica, and hornblende
- Often used for buildings and monuments

Metamorphic Rocks
What are They?

- Rocks that have changed
- They were once igneous or sedimentary
- Pressure and heat changed the rocks

Types of Metamorphic Rocks

Schist

Gneiss

Metamorphic Rocks

Metamorphic rock are sedimentary or igneous rocks that have been changed under pressure while deep in the crust of the earth. What kinds of rocks are metamorphic rock?

Metamorphic Rocks *

- Change due to temp. and pressure *
  - Heat and pressure beneath the earth's surface cause these to form
  - Formed from changes in igneous, sedimentary or other metamorphic rocks
  - Surface causes pressure to build
  - granite can change in gneiss
  - Shale changes into slate → Phyllite → schist → gneiss

Metamorphic Rocks are classified according to:

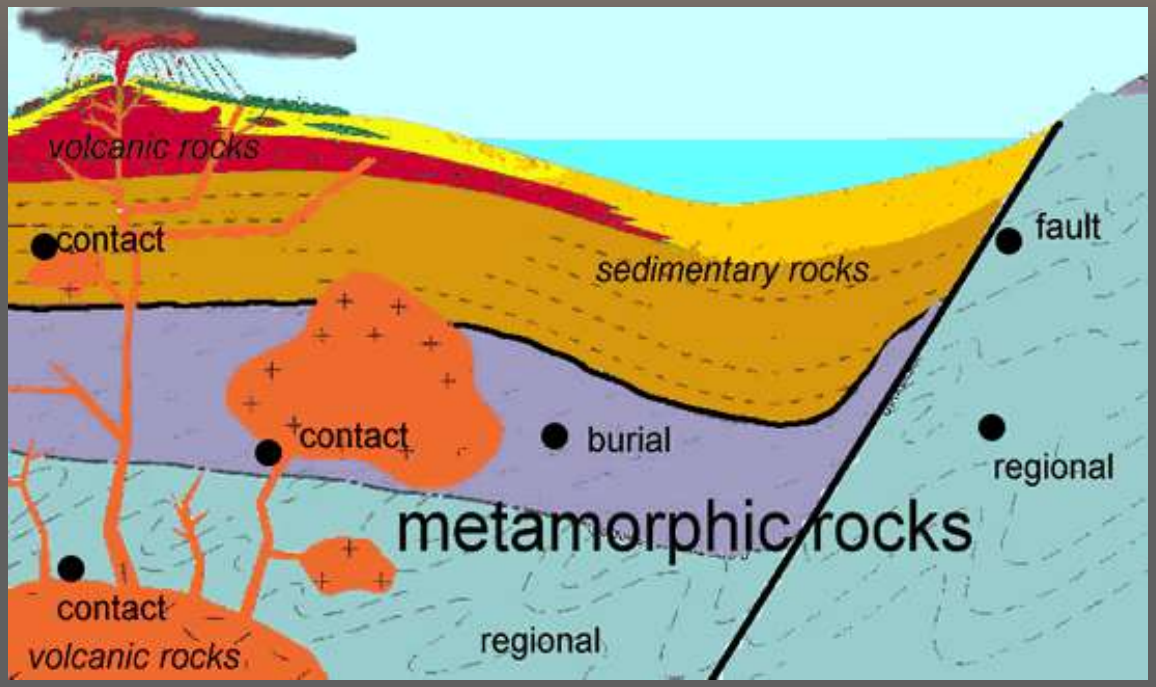
- Texture *
- lines
  - Foliated* - when mineral grains flatten and line up in parallel bands
  - Example slate & gneiss
    - Slate - is easily separated along foliated lines
    - Gneiss - alternating bands of minerals
  - Nonfoliated *- when minerals don't form bands from heat and pressure
    - Example: *
      - quartzite – from sandstone
      - Marble - from limestone

"Foliated" rocks contain much mica and other rocks that produce layering or banding

Non-foliated metamorphic rocks include marble, which comes from limestone, and quatzite, which comes from sandstone

http://www.volcanoworld.org/vwdocs/vwlessons/lessons/Metrocks/Metrocks12.html

Metamorphic Rocks



Metamorphic Rocks are formed from heat and pressure on existing rocks.

Contact metamorphism—small area in contact with an igneous intrusion "bakes" the rock and changes it.

Regional metamorphism—large area changed due to heat and pressure. Usually with mountains.

Foliated texture (shown)—bands or layers of minerals. SCHIST, SLATE, GNEISS

Nonfoliated texture—no layers. These rocks have made a complete atomic change. MARBLE, QUARTZITE

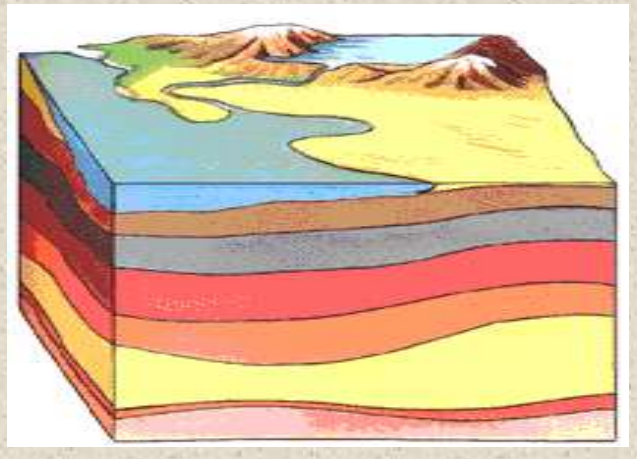
Sedimentary Rock

Pieces of rock erode and pile up in layers to create sedimentary rocks. This is where you can find fossils. What other types of rock are sedimentary rocks?

Sedimentary Rocks *

- form when sediments from erosion cement together, compaction, or precipitate/evaporate out of a solution.
  - Compaction* - sediment build up and pressure from above push the particles together to form rock
  - Cementation *- large particles like sand and rock are held together by dissolved minerals like calcite, hematitie, or limonite which cause sand and rocks to stick together
  - Sedimentary rock layers Figure 4-12
    - Rock's age

Sedimentary Rocks
How They are Made



- Wind and water break down the earth
- Bits of earth settle in lakes and rivers
- Layers are formed and build up
- Pressure and time turn the layers to rock

Compaction & Cementation

- Sedimentary rocks are formed through this process
  - Compaction - pressed together *
  - Cementation - when natural compounds form a cement like material between particles *

Types of Sedimentary Rocks

Sandstone

Limestone

Gypsum

Conglomerate

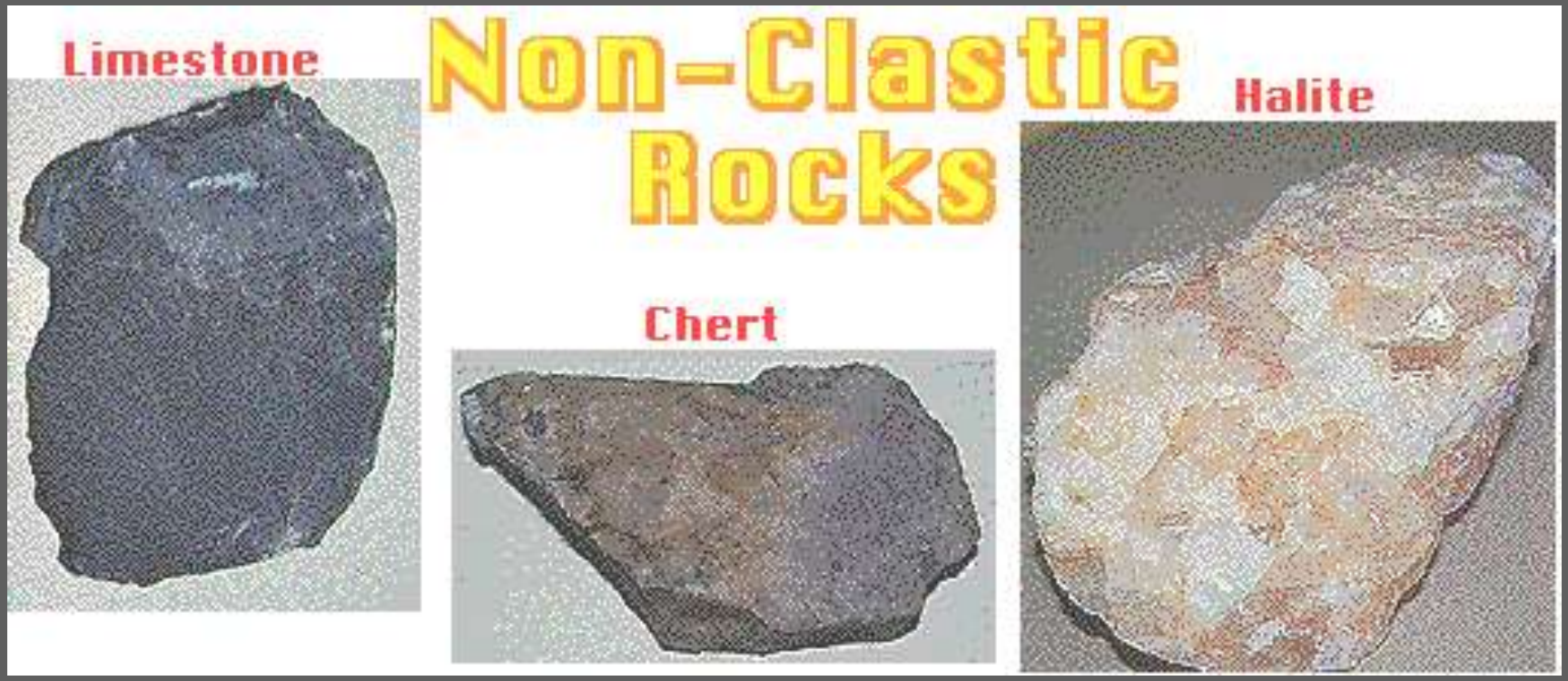
Shale

Classification of Sedimentary

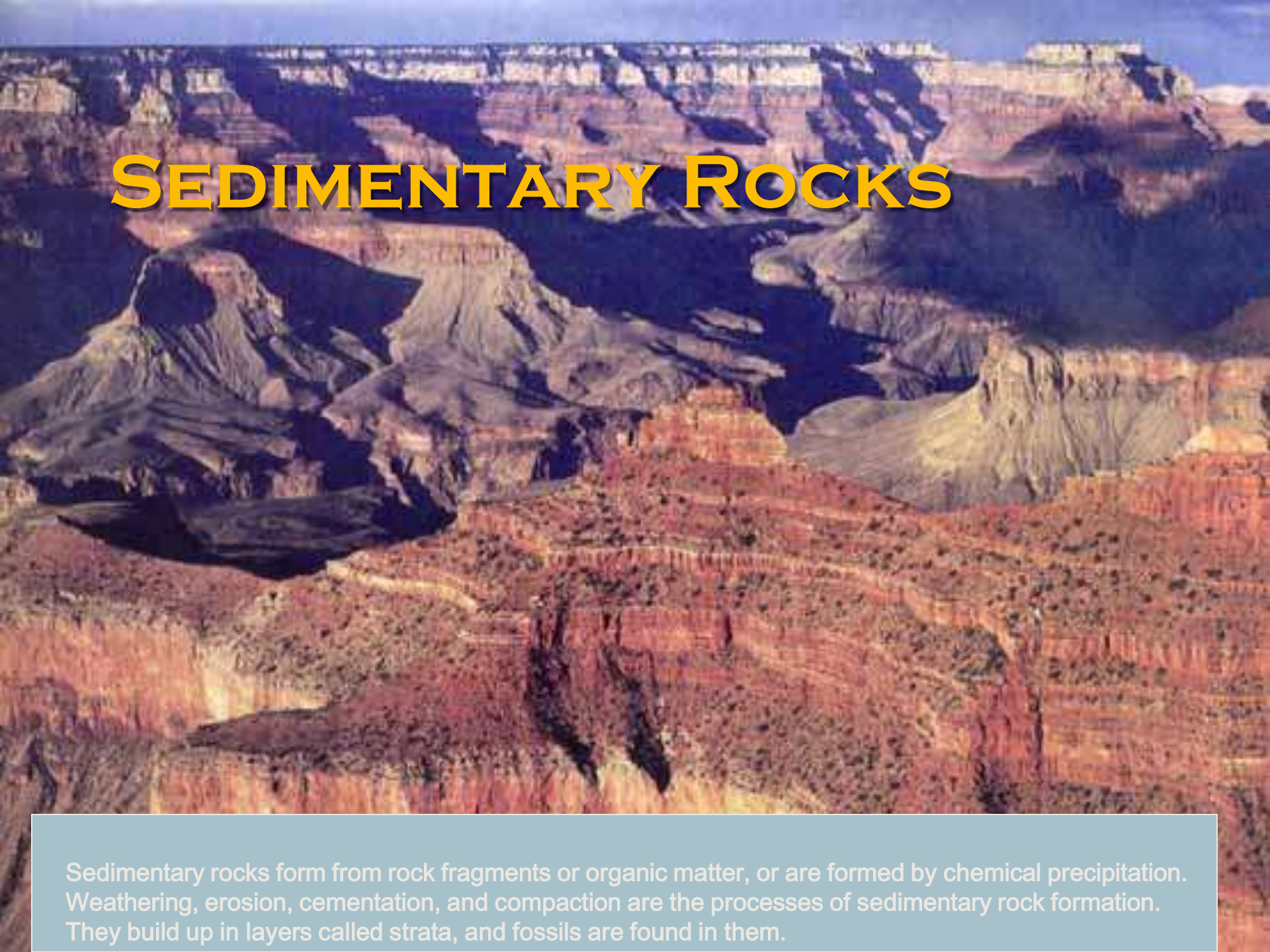
- Detrital Sedimentary Rocks (Detritus- means to wear away) - formed from broken fragments of other rocks
  - Clastic Texture (Clastic - means broken) - has a broken texture
  - This includes sandstone, breccia, and conglomerates
  - Shape and size of sediments read page 104 in text
- Chemical sedimentary rocks
  - Precipitation
  - Evaporation
  - Limestone, Rock salt, Organic sedimentary (coal) are examples of sedimentary rocks
- Organic Sedimentary Rocks
  - Coal, and chalk
- Useful Sedimentary Rocks Page 106-109

Clastic rocks–made of cemented sediments—are classified by their grain sizes.

Non-clastic rocks form by chemical precipitation (settling out from a solution.) Limestone is made from calcite, chert from quartz, and halite is rock salt.



Sedimentary Rocks



Sedimentary rocks form from rock fragments or organic matter, or are formed by chemical precipitation. Weathering, erosion, cementation, and compaction are the processes of sedimentary rock formation. They build up in layers called strata, and fossils are found in them.

Types of Sedimentary Rocks

Clastic rocks—made of fragments of other rocks

Conglomerate (pictured)—rounded pebbles; Sandstone—sand; Shale—made of compacted clays

Organic rocks—made from past living sources

Limestone—microscopic sea animals; Coal (pictured)—fossilized swamp plant material

Chemical rocks—formed from precipitation or evaporation of liquids

Limestone—cave structures; Halides and Rock Salt (pictured)—evaporation of water

Shale with plant fossils

Sandstone

C

Conglomerate

Fossiliferous limestone

Rock Salt


Rocks Have Been Used For Many Years
and
For Many Things


Hoover Dam
C45-300-021094


Crayola
AN DU SEPTIC
ANTI-DUST
CHALK
WHITE

Rocks

Rock On!!!!