



# Rocks

# Rock Identification Booklet

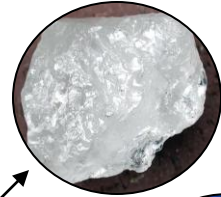
Do not write in booklet Return at end of class

A rock is a combination of two or more minerals.

## Common minerals found in rock:

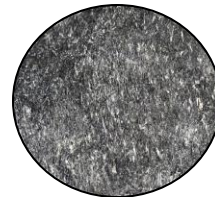
Silicate minerals - usually light colored

1. Quartz ... usually white, pink or clear
2. Feldspar ... usually white or pink



Ferromagnesian minerals - usually dark colored

- ← 1. Biotite ... black
- ↙ 2. Muscovite ... brown
3. Hornblende ... black
4. Magnetite ... black
5. Olivine ... dark green



Rock Texture: The size of the individual grains (pieces of mineral) that make up the rock.

1. Coarse grained - grains over 5 millimeters in size
2. Medium grained - grains 1 mm to 5 mm in size
3. Fine grained - grains less than 1 mm in size
4. Glassy - no grains present (cooled too rapidly for grains to form)
5. Frothy - light weight and full of holes (example: Pumice)
6. Vesicular - heavy and full of holes (example: Vesicular Basalt)
7. Conglomeritic - a mixture of different grain sizes (ex: Conglomerate)

## Major Rock Types:

1. IGNEOUS - formed from the cooling of hot molten rock.
2. SEDIMENTARY - formed from pieces of other rocks cemented together.
3. METAMORPHIC - formed from pre-existing rocks that were changed by heat and pressure.

# Igneous Rocks

Igneous rocks are formed from the cooling of hot molten rock.

**Magma** is hot molten rock beneath the Earth's surface.

**Lava** is hot molten rock on the Earth's surface.

Intrusive Igneous Rocks - cooled slowly from magma (coarse or medium grained)

1. **Granite** - coarse grained, contains quartz, feldspar, mica, and hornblende. The most abundant igneous rocks on land.



2. **Gabbro** - coarse grained, contains feldspar, mica, and olivine but no quartz.



Extrusive Igneous Rocks - cooled quickly from lava (fine grained or glassy)  
(Volcanic Igneous Rocks)

1. **Rhyolite** - fine grained, same minerals as granite.



2. **Basalt** - fine grained, most abundant rock on Earth (makes up ocean floor).



3. **Pumice** - frothy glass texture, same minerals as granite. Light weight.



4. **Obsidian** - glassy texture, same minerals as granite. Heavy.



# Sedimentary Rocks

Sedimentary rocks are formed from pieces of other rock cemented together, from dissolved minerals, and from organic material.

Clastic Sedimentary rock - made from rock fragments cemented together.  
(see list of "sediments by name" on next page)



1. **Shale** - made of a mixture of silt and sand sized grains cemented together. Breaks into layers.



2. **Sandstone** - made of sand sized particles cemented together. Usually fine or medium grained.



3. **Conglomerate** - made of all different sized grains cemented together. Called **Breccia** if the particles are angular, **Conglomerate** if rounded.

Chemical / Biochemical Sedimentary rock - made from minerals dissolved in sea water.



1. **Limestone** - made of calcium carbonate from the mineral calcite and from crushed sea shells.



2. **Dolomite** - made of calcium magnesium carbonate and the mineral dolomite.



3. **Chert** - made from dissolved quartz. May have small crystals.

Organic Sedimentary rock - made from the remains of dead plants and animals buried for millions of years. No minerals are present.

1. **Coal (lignite and bituminous)** - made from dead plants and other organic material buried for millions of years. No minerals are present.





# Sediments by Name

The names sediments depend upon their size.

<u>Sediment Name</u>	<u>Size</u>	<u>Rock Name</u>
BOULDER	256 mm or larger	
COBBLE	64 - 255 mm	Conglomerate
PEBBLE	4 - 63 mm	
GRANULE	2 - 3.9 mm	
COARSE SAND	.5 - 1.9 mm	Sandstone
FINE SAND	.0625 - 1.8 mm	
SILT	.0039062 - .0624 mm (too small to see)	Shale
CLAY	.0039061 mm or smaller (way too small to see)	



# Metamorphic Rocks

Metamorphic rocks are formed from pre-existing rocks that have been changed by heat and pressure.

Regional Metamorphic rock - formed from extreme heat

1. **Slate** - formed from shale.



2. **Marble** - formed from limestone.



3. **Quartzite** - formed from quartz sandstone.



Dynamic Metamorphic rock - formed from extreme pressure as mountains are uplifted and folded.

1. **Gneiss** - formed from granite.



2. **Schist** - formed from gabbro, basalt, or sandstone.

