

BUILDING MATERIALS- STONES -1-(Geological classification)

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STONES



- **Naturally occurring building material**
- **Obtained from rocks**



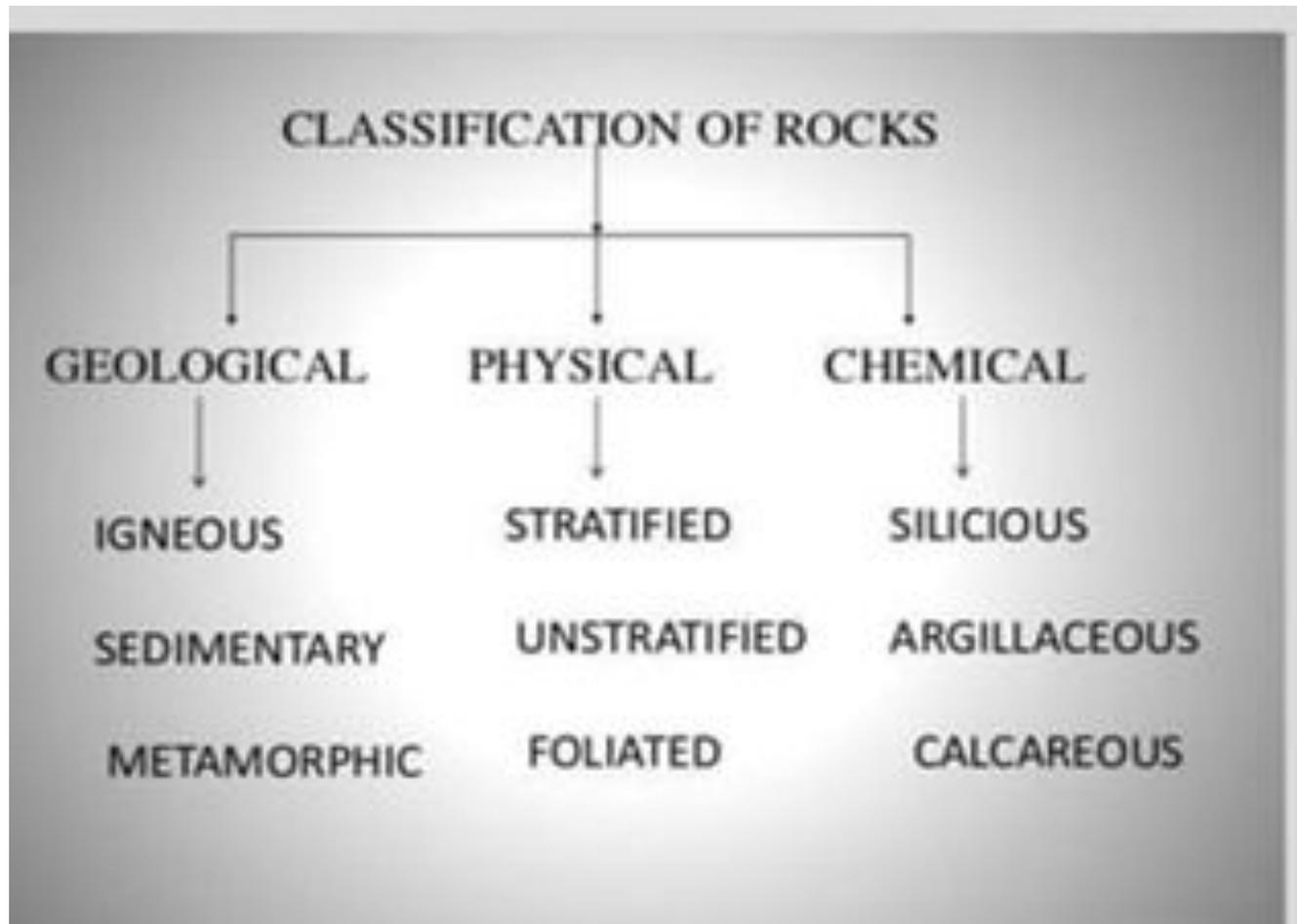
Pyramids of Egypt



Taj mahal



Great wall of china



Geological Classification

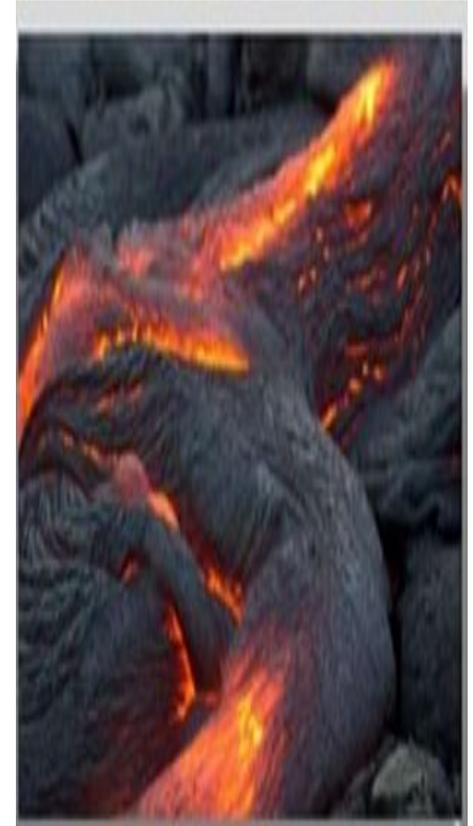
Based on mode of formation of the rock from which building stones are obtained.

Three main group recognized are:

- I) Igneous Rocks
- II) Sedimentary Rocks
- III) Metamorphic Rocks

IGNEOUS ROCKS

- (Greek word ignis= fire)
- The rocks which are formed by cooling of magma are known as the igneous rocks.
- Molten or pasty rocky material is known as **Magma**



Basis of depth and cooling rate:

(a) Plutonic rocks -: The cooling of magma at **considerable depth** from earth surface.

- The cooling rate is slow
- rocks possess coarsely grained crystalline structure
- e.g. **Granite**
- Commonly used in building industry

(b) Hypabyssal rocks

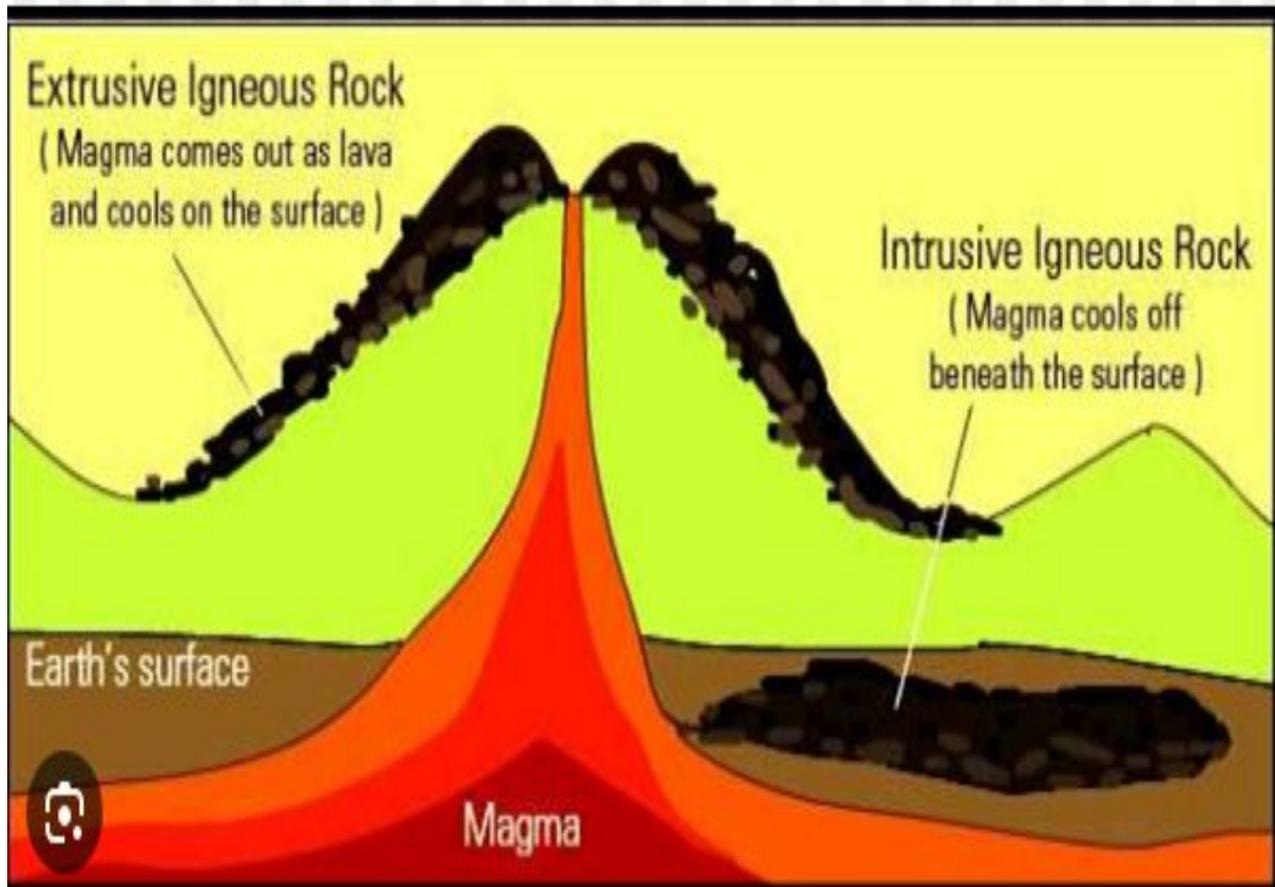
- Cooling of magma at relatively **shallow depth** from earth surface
- Cooling rate quick
- finely grained crystalline structure.
- e.g. **Dolerite**

(c) Volcanic rocks

- Cooling of magma at **earth surface**
- Cooling rate very rapid
- Non crystalline very fine grained structure
- Used in ornamental purpose, monuments
- e.g. **Basalt, trap**(railway ballast)



Granite



- **The mineral liquid exist below earth surfce is called Magma.**
- **The rock formed by solidification of Magma are called as Intrusive Rock.**
- **The mineral of liquid exists on the earth surface is called Lava.**
- **The solidification of lava forms the extrusive rock/volcanic/effusive**



Plutonic



Hypabyssal



Volcanic

Based on Silica content Igneous rocks are classified into four type

Type	% Silica	Example
1. Acid Rock	> 70 %	Granite
2. Neutral Rock	60 – 70 %	Andesite
3. Basic Rock	45 – 60 %	Gabbro
4. Ultra Basic Rock	< 45 %	Basalt

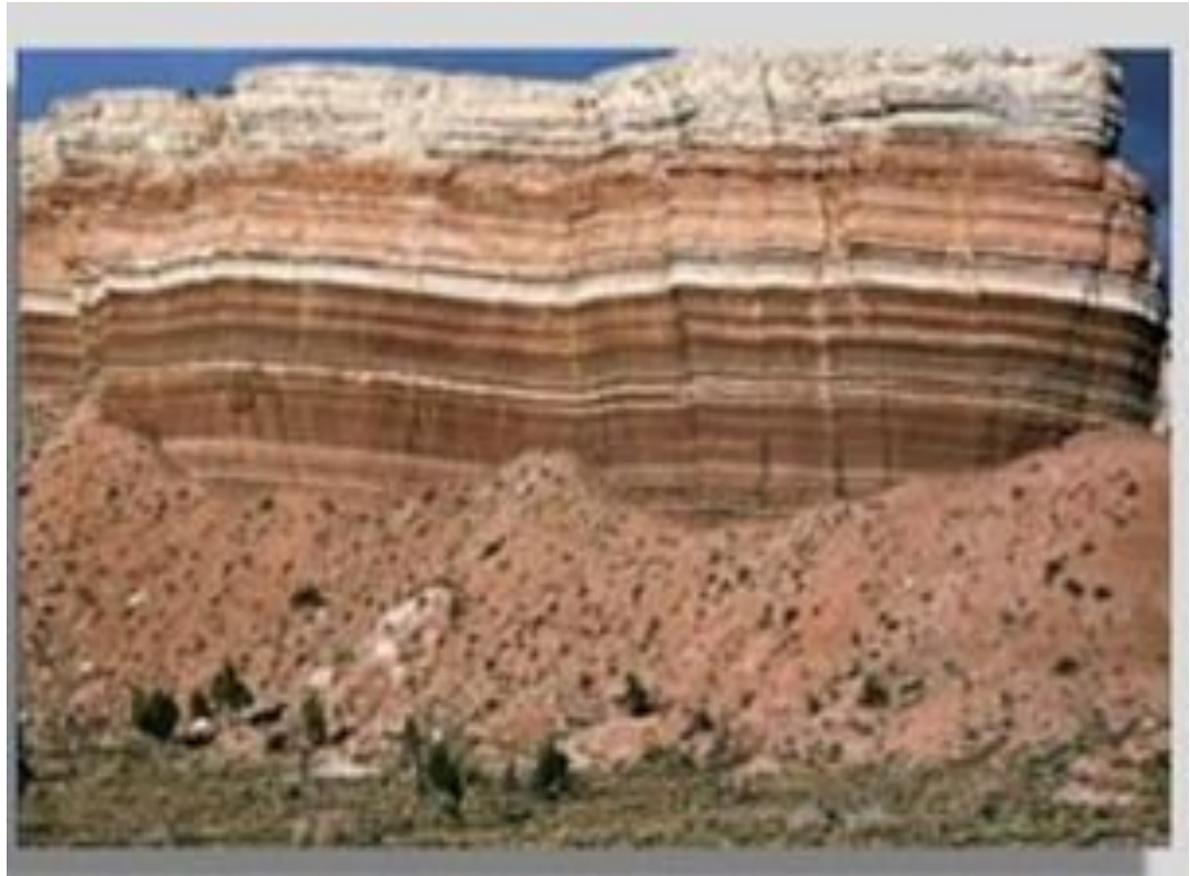
EXAMPLES

- **PLUTONIC-** syenites,gabbro,diorite ,sill,dike
- **VOLCANIC-** pumice,obsidian,Andesite

Sedimentary/Aqueous rocks

- (sediment=particle)
- Formed by the deposition of products of weathering on the pre existing rocks
under the influence of natural agencies like wind, water and ice and atmospheric gases.
E.g gypsum,gravel,
lime stone, sand stone,
shale, kankar,lignite

Sediments	Rock Form
1. Gravel	Conglomerate
2. Sand	Sand Stone
3. Silt	Silt Stone
4. Clay	Shale
5. Lime	Lime stone / dolomite
6. Gypsum	Gypsum stone



(a) Residual deposits-:

- Some portion of the weathering products remain in the site of **origin**

(b) Sedimentary deposits-:

- **Insoluble products** of weathering carried away in **suspension**

(c) Chemical deposits

- Some materials are carried away in **solution** and gets deposited by some **physiochemical** process such as evaporation

(d) Organic deposits

- Products of weathering deposited through agents like **living organisms**

EXAMPLES

- **SEDIMENTARY-chalk,lime tuffa,magnesite**

- **Metamorphic rocks**
Formed by metamorphism of igneous and sedimentary rocks when subjected to great heat and pressure
- Eg: Gneiss, marble, slate, laterite, quartzite
- Weather resistant metamorphic rock - quartzite



TYPES OF METAMORPHISM

1. **Thermal metamorphism-:** Heat is the predominant factor in this type of metamorphism.
2. **Cataclastic metamorphism -:** Direct Pressure is the agent for this type of metamorphism.
3. **Plutonic metamorphism -:**
 - Uniform pressure and heat
 - Occur at greater depth
4. **Dynamo thermal metamorphism -:**
 - Heat and stress.

Parent rock	Metamorphic rock
Granite/syenite (I)	gneiss
Limestone/marl/dolomite (S)	marble
Sandstone (S)	quartzite
Basalt/doloerite (I)	schist
shale/mudstone (S)	slate
Moorum (S)	laterite

