

# MODULE-2\_IGNEOUS PETROLOGY

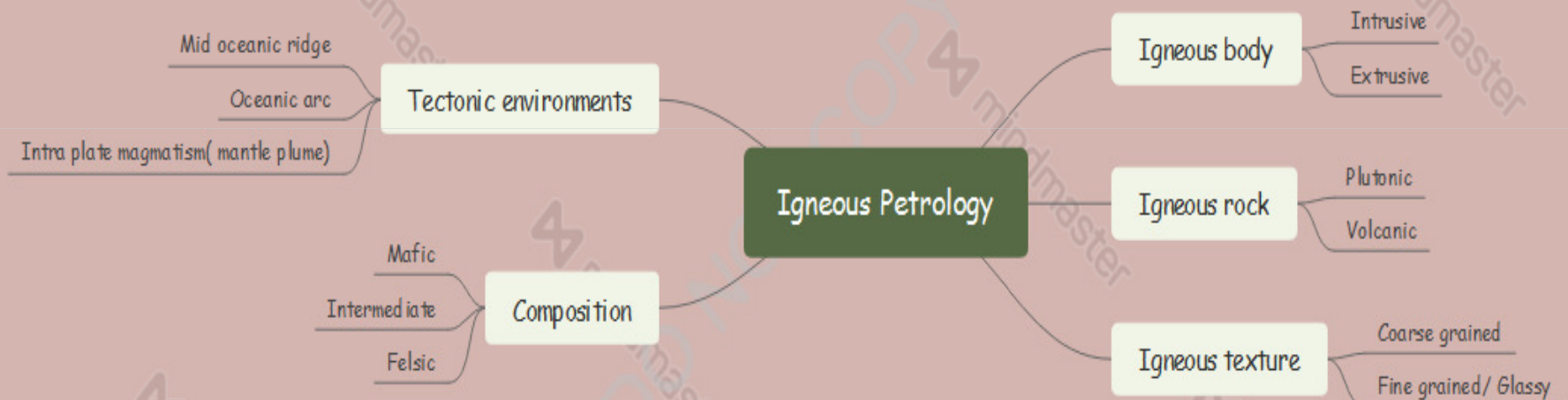


CC5T  
3<sup>RD</sup> SEMESTER  
DEPT. OF GEOLOGY  
APARUPA BANERJEE

# IGNEOUS PETROLOGY

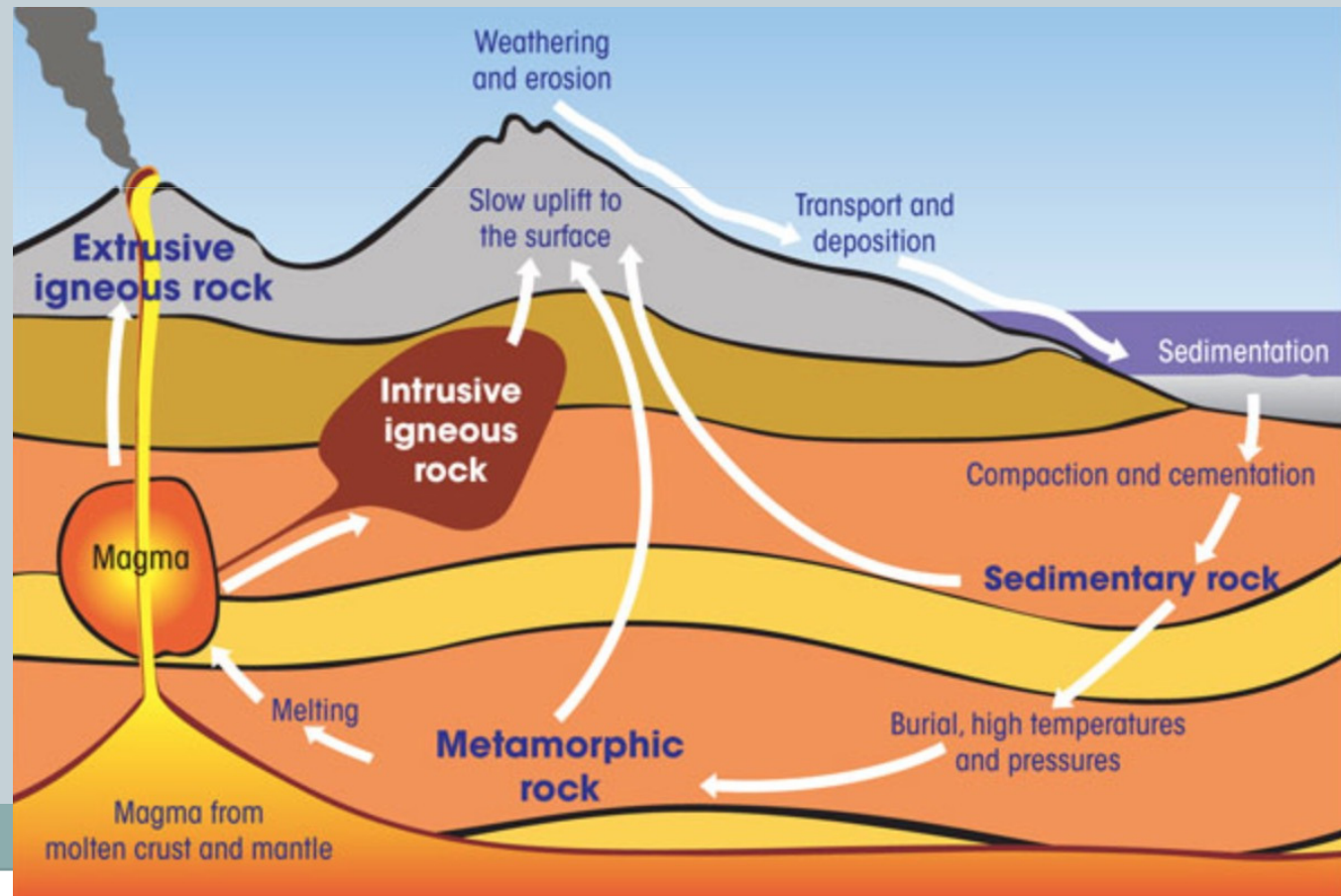


mindmaster



# IGNEOUS BODY

- INTRUSIVE BODY
- EXTRUSIVE BODY



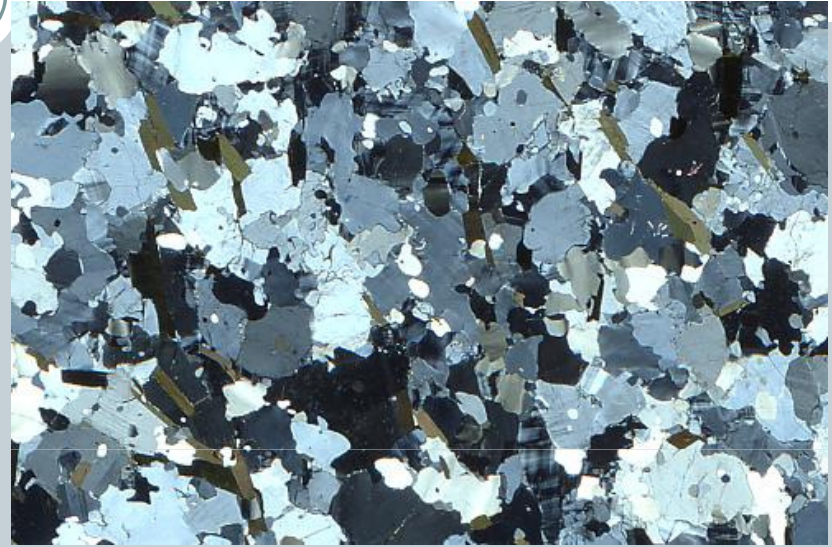
# IGNEOUS ROCK



- **PLUTONIC IGNEOUS ROCK: (e.g Granite, Gabbro)**
  - DEEP SEATED,
  - COARSE GRAINED
  - HIGH GROWTH RATE
  - SLOW COOLING RATE
- **VOLCANIC IGNEOUS ROCK: (e.g Rhyolite, Basalt)**
  - EXPOSED IN EARTH'S SURFACE
  - FINE GRAINED
  - SLOW GROWTH RATE
  - FAST COOLING RATE

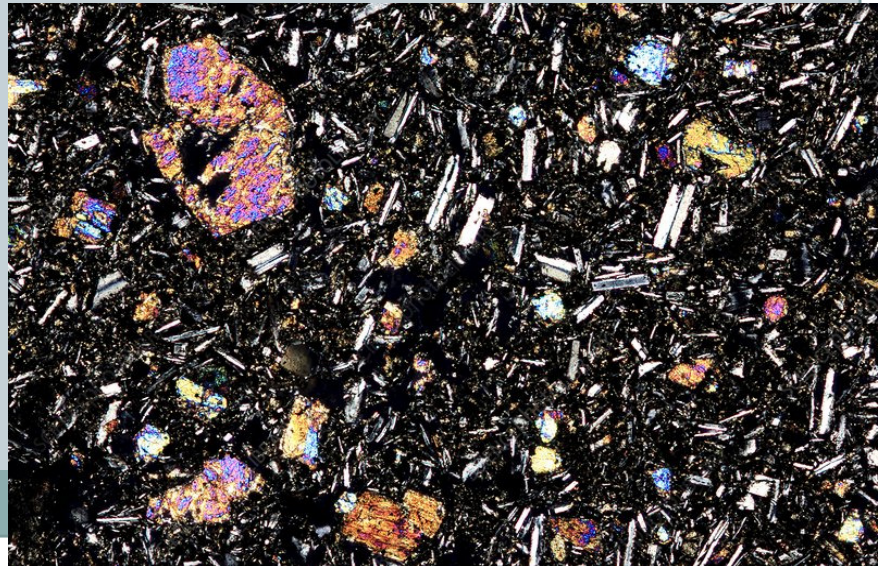
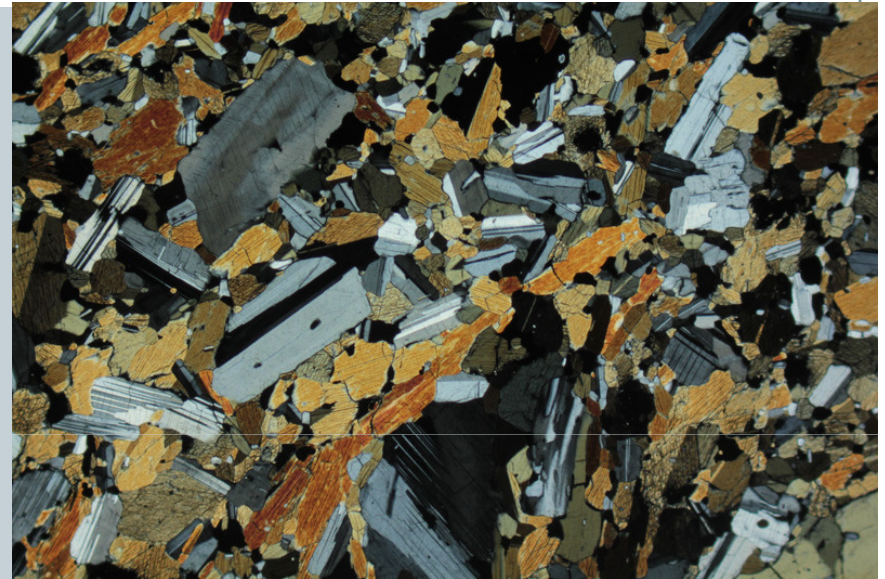


# GRANITE & RHYOLITE





# GABBRO & BASALT

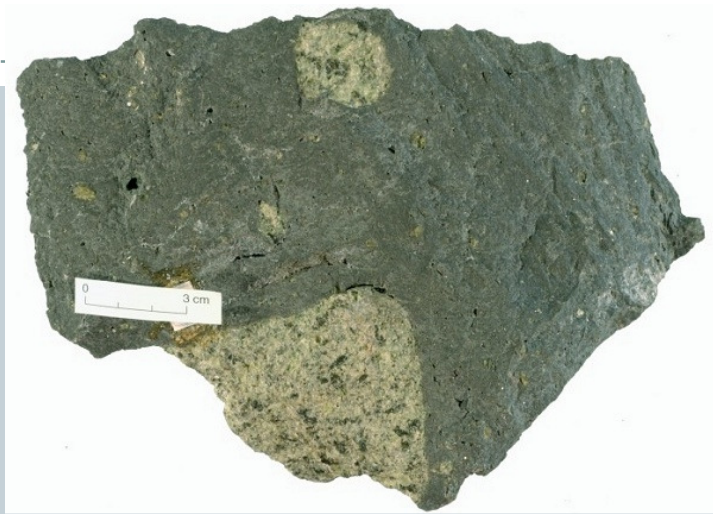




# TYPES OF BASALT



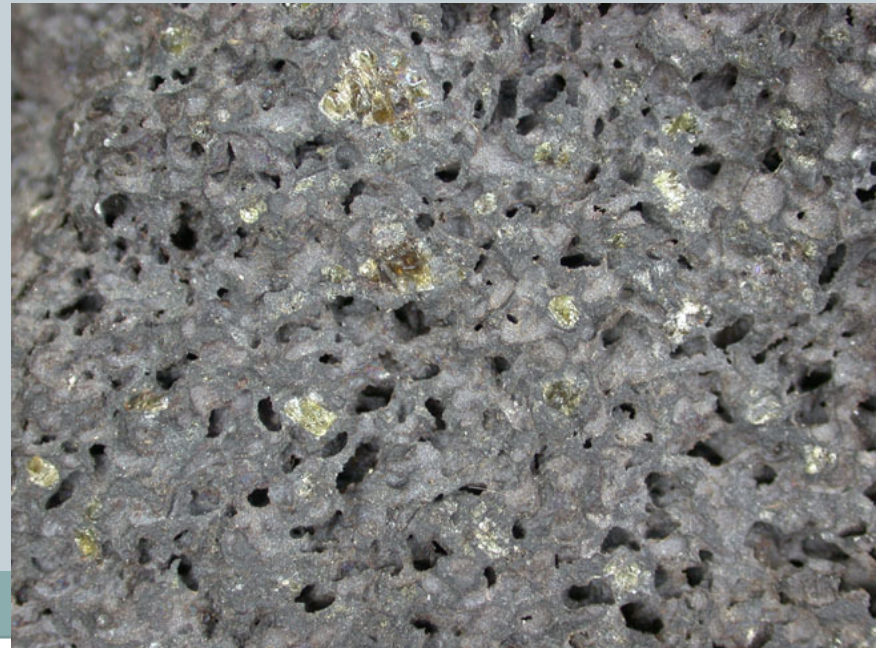
VESICULAR BASALT



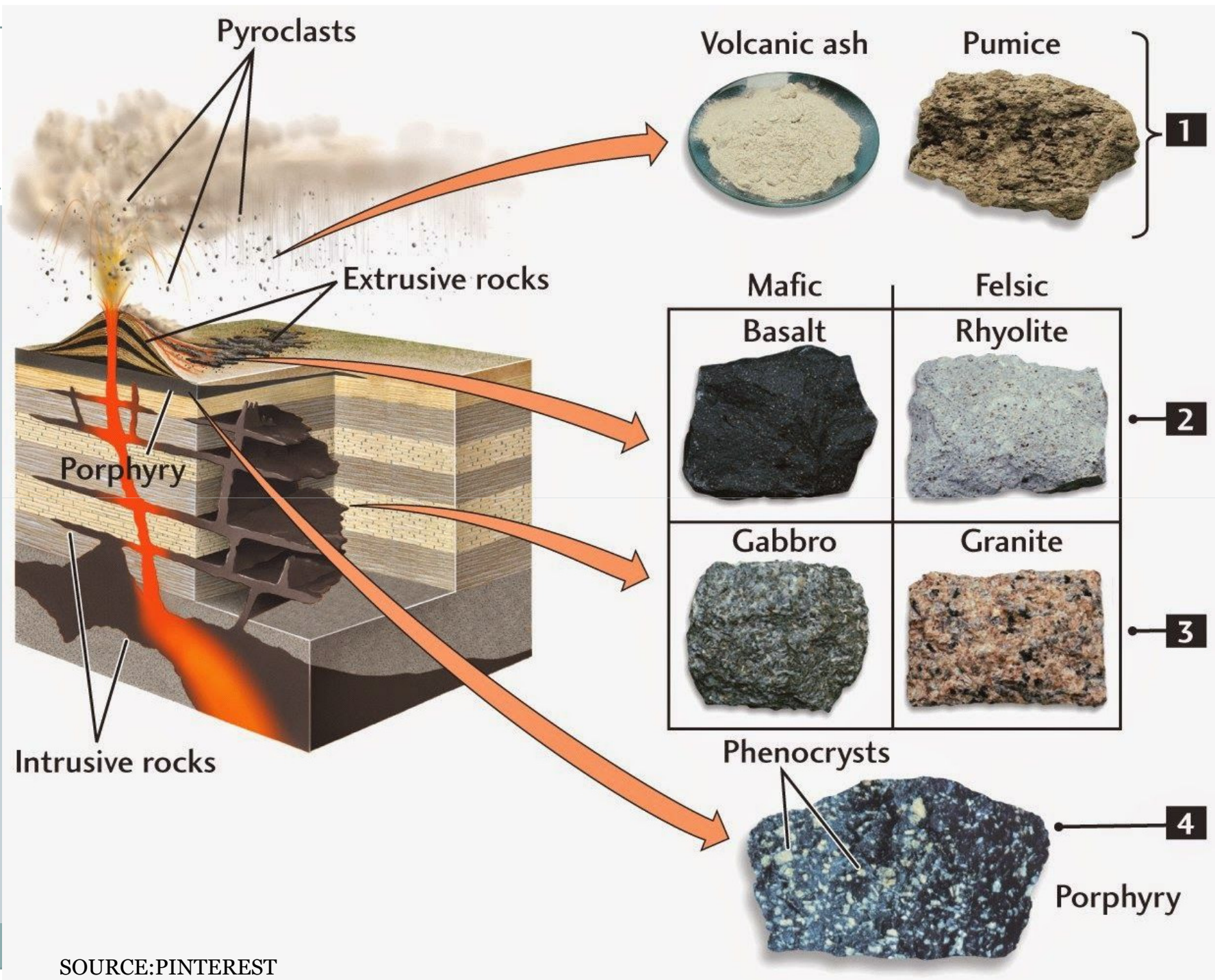
BASALT WITH OLIVINE XENOCRYST



AMYGDALOIDAL BASALT









# COMPONENTS OF IGNEOUS ROCKS

## LAVA: EXTRUSIVE SURFACE FLOWS



Basalt

Andesite

Dacite

Rhyolite

Lava flows typically produce rocks with 0-50% crystals (minerals) suspended in a fine-grained groundmass of glass and/or microscopic minerals.

**Volcanic rock name**

## PLUTONIC ROCKS: SUBSURFACE INTRUSIVE PRODUCT



Gabbro

Diorite

Granodiorite

Granite

Coarse-grained rock; entirely crystalline with interlocking minerals in the proportions below. (Colors roughly correlate to graph below.)

**Plutonic rock name**

Dark-colored iron- and magnesium-rich minerals, including:

olivine  
pyroxene

hornblende

biotite

FELDSPARS

(Plagioclase)

(Alkali)

QUARTZ

50

55

60

100

**Volume percent of minerals present in igneous rocks.**

This generalized guide shows proportions of common minerals likely to be present in an igneous rock. (See text below on how to calculate.)

Plutonic rocks are entirely crystalline and have a larger variety of unusual minerals than volcanic rocks.

0%

70 %SiO<sub>2</sub>

# COMPOSITION



## Characteristics of Igneous Rocks

### Mineral Composition

#### Mafic



Basalt

#### Intermediate



Andesite

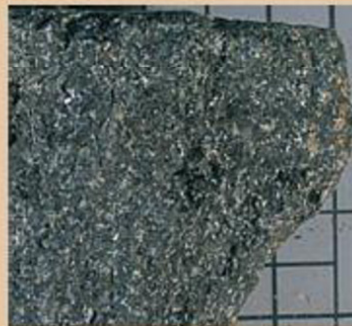
#### Felsic



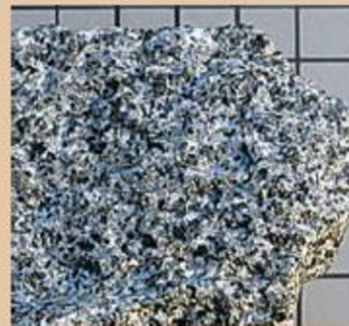
Rhyolite

Extrusive,  
rapid-cooling  
fine crystals

Intrusive,  
slow-cooling  
coarse crystals



Gabbro



Diorite



Granite



# TEXTURE IN HAND SPECIMEN

## Igneous textures



Fine-grained



Coarse-grained



Large crystals in matrix



Glassy

THANK YOU

