Identification of Rocks

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Why rock identification is important?

How do we identify rocks?
   In hand specimen level
   Microscopically

Factors in identifying rocks

How these factors are formed

Types of rocks and identifying them
What are rocks?

Hard material composed mainly of minerals

Why identification is important?

- Build massive buildings, tunnels, roads
- Landslide mitigation
- Earthquake analysis
- Construction material
- History
How do we identify rocks?

1. Hand specimen - naked eye, hand lens, simple chemicals

2. Microscopic - thin sections of rocks
What do we consider in identifying rocks?

Colour, Composition and Texture

Minerals are the main component of most rocks

The arrangement and the relative percentages of components are considered as texture
- Components are decided by the source and the physical condition.

- The texture is controlled by the physical conditions and the environment of formation.
3 major rock types depending on their formation.

- Igneous
- Sedimentary
- Metamorphic

How these rocks are characterized by their composition and texture?
Igneous Rocks

Cooling inside the earth (crust)-
Plutonic

Cooling on the surface of the earth-
Volcanic
Volcanic rocks- cool rapidly, mostly fine grains

Plutonic rocks- cool relatively slowly, time for crystal growth
Granite- is a common plutonic rock composed mainly of quartz, feldspar and mica. Colour index 10

Biotite, Hornblende, Pyroxene, Olivine
10-20- acidic

20-25- intermediate

25-50- basic

50-90- ultra-basic
Volcanic rocks

Gas emission causes vesicles

Rapid cooling results natural glass

Flowing of lava- flow texture
Sedimentary rocks

Broken rock particles and once lived organisms

3 main groups

- Clastic - broken fragments of old rocks
- Chemical - water dissolved minerals precipitation
- Biological - carbon rich plant material, animal shell
Common clastic sedimentary rocks

- Rounded gravel (<2mm) in a sandy matrix and poorly sorted. (Conglomerate)

- Well sorted sand (.075-.2mm) tightly packed.

- Even finer particles, with fossils.
Common chemical sedimentary rocks

rock salt (NaCl)

Chert (SiO$_2$)
Common biological sedimentary rocks

- Calcareous skeletons of organisms
- Availability of fossils
- React with dilute acids
- Limestone ($\text{CaCO}_3$)
Biological contd.

Dark in colour, availability of plant fossils

Siliceous skeletons

Coal

Chert
Metamorphic rocks

Foliated
- Platy minerals,
- Alternating bands

Non-foliated
- Interlocking grains with no pattern
Source rock

Rock type 1

Rock type 2

Rock type 3
Summary
THANK YOU