

The Rockin' World of Geology (Part 1)

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I. Principles

A. Geologic Time – The Earth in

Context

1. relative dating
2. absolute dating
3. deep time: an overview
 - a. eons
 - b. eras
 - c. periods
 - d. epochs

B. Principles of Geology

1. the geologic record
2. fundamental principles of geology
 - a. principle of original horizontality
 - b. principle of superposition
 - c. principle of lateral continuity
 - d. law of cross-cutting relationships
 - e. principle of fossil succession
 - f. principle of uniformitarianism

C. Minerals

1. crystalline and amorphous structures
 - a. polymorphs
 - b. isomorphs
2. physical properties
 - a. hardness
 - b. cleavage
 - c. fracture
 - d. luster
 - i. metallic
 - ii. nonmetallic
 - e. color

II. Processes

A. Magmas and Intrusive Rocks

1. the difference between lava and magma
2. types of igneous rock
 - a. extrusive
 - b. intrusive

3. plutons

- a. concordant plutons
- b. discordant plutons
- c. batholiths
- d. stocks
- e. dikes
- f. sills

4. types of magma

- a. felsic magma
- b. mafic magma
- c. intermediate magma
- d. ultramafic magma

5. igneous textures and colors

- a. fast vs. slow cooling
 - i. porphyritic texture
 - ii. phenocrysts
- b. colors
 - i. felsic
 - ii. mafic

6. magmatic differentiation and

- Bowen's reaction series
- a. discontinuous branch
 - b. continuous branch

B. Volcanic Rocks and Processes

1. lava
 - a. aa
 - b. pahoehoe
2. pyroclastic materials
 - a. ash
 - b. pumice
 - c. tuff
3. volcanic edifices
 - a. shield volcanoes
 - b. stratovolcanoes
 - c. cinder cones
 - d. fissure eruptions
4. locations of volcanoes

C. Weathering and Erosion

1. physical weathering
 - a. frost wedging
 - b. exfoliation
 - c. thermal expansion and contraction
2. chemical weathering
 - a. dissolution

b. oxidation

c. hydrolysis

3. factors that affect weathering

4. erosion
 - a. mass wasting
 - i. creep
 - ii. avalanche
 - iii. mudslide
 - iv. landslide
 - b. rock fall
 - c. solifluction

D. Sedimentation and

Sedimentary Rocks

1. the rock cycle
2. clastic sedimentary rocks
 - a. conglomerates
 - b. sandstones
 - c. mudstones
 - i. siltstone
 - ii. shale

3. chemical sedimentary rocks

- a. carbonate rocks
- b. evaporites

4. biochemical sedimentary rocks

5. paleoenvironments
 - a. fluvial
 - b. deltaic
 - c. desert
 - d. glacial
 - e. shallow marine
 - f. lacustrine
 - g. beach
 - h. turbidite
 - i. pelagic

6. stratification

- a. cross-bedding
- b. ripple marks
- c. graded bedding
- d. mud cracks

7. sedimentary facies

- a. marine transgression
- b. marine regression

Chart of Eras And Periods Of The Phanerozoic Eon:

<u>Era</u>	<u>Period</u>	<u>Millions of yrs ago</u>
Cenozoic	Quaternary	1.6-present
	Tertiary	66
Mesozoic	Cretaceous	144
	Jurassic	208
	Triassic	245
Paleozoic	Permian	286
	Carboniferous	
	(Pennsylvanian)	320
	(Mississippian)	360
	Devonian	408
	Silurian	438
	Ordovician	505
Cambrian	570	
Precambrian		570-4,600

Mohs Hardness Scale:

<u>Hardness</u>	<u>Mineral</u>
10	Diamond
9	Corundum
8	Topaz
7	Quartz
6	Orthoclase
5	Apatite
4	Fluorite
3	Calcite
2	Gypsum
1	Talc

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