

Name: _____

Date: _____ Period: _____

Class Notes: Geologic Time

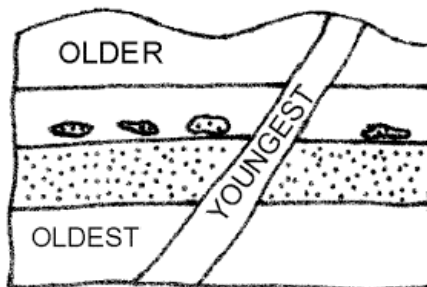
I. Relative Dating

- Uniformitarianism - _____

- "The present is the key to the past"

- Relative Dating - _____

- Principle of Superposition - _____



- Original Horizontality - _____

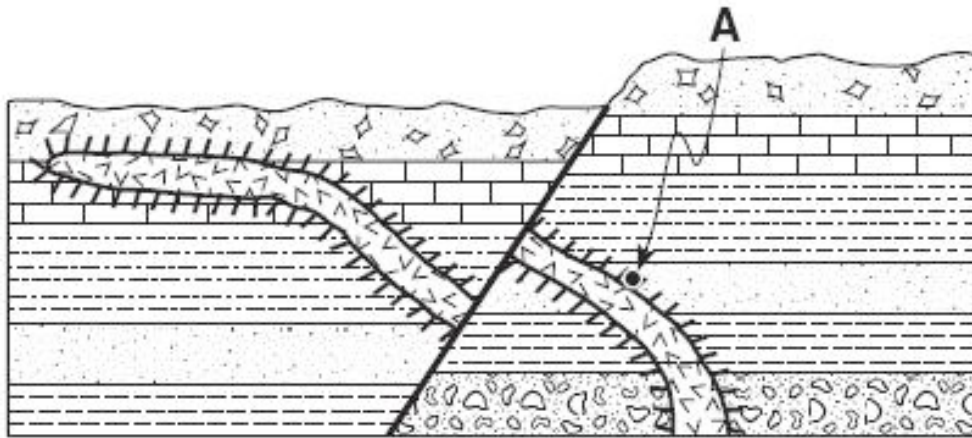
- Extrusions - _____

- Intrusions - _____

 - Younger than the rocks that they crosscut
 - Exception to the principle of superposition

Class Notes: Geologic Time

- Contact Metamorphism - _____
-

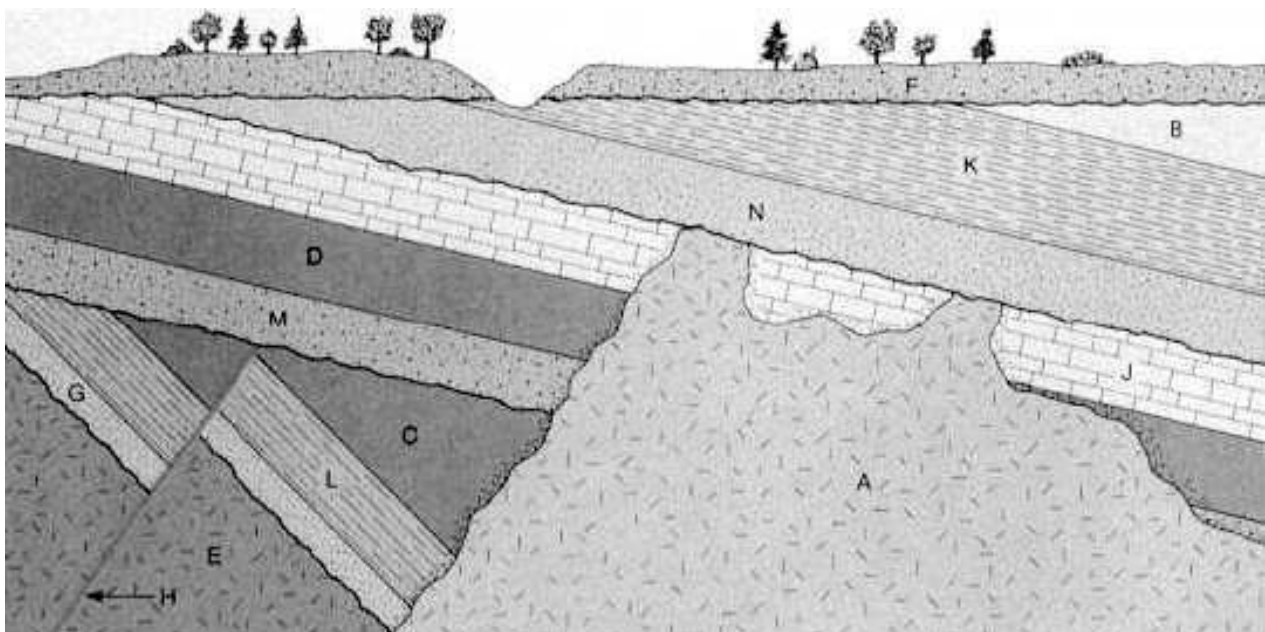


- Faults - _____
-

- Younger than the rocks that they crosscut

- Folds - _____
-

- Exception to the principle of superposition



Class Notes: Geologic Time

- Correlation - _____

- Correlation is the most effective method when using relative dating

- What to look for when correlating rocks:

- _____
- _____
- _____
- _____
- _____

- Fossils - _____

- Examples: bones, shells, footprints, and organic compounds (DNA)

- Index Fossils - _____

- Best method for correlating rocks

- To be considered a good index fossil it needs to meet two criteria:

1. _____
 - Large horizontal distribution
2. _____
 - Small vertical distribution

- Geologic Time Markers - _____

- Examples: volcanic ash deposits and meteorite impacts

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II. Absolute Dating

- Absolute Dating - _____

- Radioactive Decay - _____

- Isotopes - _____

 - Example:
 - Stable carbon has a mass of 12 units called Carbon-12
 - Isotopic carbon has a mass of 14 units called Carbon-14
- Half-Life - _____

 - In a given sample of a radioactive isotope half of the atoms will decay to a _____ product, but the remaining half is still _____
- Each element has its own half-life that range from fractions of a second to billions of years

Radioactive Decay Data

RADIOACTIVE ISOTOPE	DISINTEGRATION	HALF-LIFE (years)
Carbon-14	$C^{14} \rightarrow N^{14}$	5.7×10^3
Potassium-40	$ \begin{array}{c} K^{40} \rightarrow Ar^{40} \\ \searrow \\ Ca^{40} \end{array} $	1.3×10^9
Uranium-238	$U^{238} \rightarrow Pb^{206}$	4.5×10^9
Rubidium-87	$Rb^{87} \rightarrow Sr^{87}$	4.9×10^{10}

- The half-life of an isotope is not effected by any _____ such as _____, _____, or _____

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- Uranium-238 - _____

 - Mass: _____
 - Decay: _____
 - Half-Life: _____

- Carbon-14 - _____

 - Mass: _____
 - Decay: _____
 - Half-Life: _____

III. Early Evolution

4.6 Billion Years Ago

- _____

4.5 Billion Years Ago

- _____

4.4 Billion Years Ago

- During early Earth's melting, material separated into zones according to their densities
 - _____
 - _____
 - _____

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4.2 Billion Years Ago

- _____
- Gases trapped inside the Earth seeped out in a process called _____ and created a completely different second atmosphere

3.9 Billion Years Ago

- After the crust had cooled enough, _____ in the atmosphere began to precipitate and form _____ on Earth

3.8 Billion Years Ago

- Weathering erosion, and deposition began and the first _____ rock was formed

3.5 Billion Years Ago

- _____

- _____

3.5 - 2.8 Billion Years Ago

- Oxygen in the atmosphere reacted with iron in the soil to produce _____
- Resembled the surface color of current day Mars

2.8 Billion Years Ago

- _____

2.8 - Present Billion Years Ago

- Life slowly evolved from single-celled bacteria to multicellular to hard parts on life forms

