

Geologic Time Notes

Name: _____ Date: _____ Log #: _____

I. Life and Geologic Time

A. Geologic time - Earth's history is divided into time units that make up a geologic time scale.

1. Time units on the scale are based on the appearance or disappearance of types of organisms such as trilobites, index fossils that lived during specific periods of time.

2. Geologic time is divided into four major Subdivisions

a. Eons - longest subdivision; based on abundance of fossils

b. Eras - marked by significant worldwide changes in the types of fossils present in rocks.

c. Periods - based on types of life existing worldwide at a particular time.

d. Epochs - characterized by differences in life-forms, but differences can be regional rather than global

3. Geologic time can be subdivided only if fossils are present in the rock record

B. Organic evolution - Organisms have changed over time, most likely due to environmental factors.

1. Species - organisms that normally reproduce only with other members of their group
2. Darwin's Theory of natural Selection - organisms more adapted to an environment are more likely to reproduce.
3. Natural selection within a species occurs only if characteristics present in some numbers increase their Survival.
4. Artificial selection - breeding individuals with desired characteristics
 - a. Humans use this type of selection when breeding domestic animals
 - i. Golden doodle
 - ii. Dorkey
5. New ^{natural} species can evolve from natural selection

C. Trilobites - have an exoskeleton with three lobes; lived in oceans for more than 200 million years

1. Trilobite eye position changed as the species adapted to various environments
2. Trilobite bodies and tails changed in response to changing environments
3. Continual collisions formed the giant landmass Pangea near the end of the Paleozoic Era. These collisions may have dropped Sea levels causing the extinction of trilobites.

II. Early Earth History

A. Precambrian time - from 4 billion to about 544 million years ago

1. Very few fossils remain from this time
 - a. Many Precambrian rocks were deeply buried, causing the fossils in them to be changed by heat and pressure.
 - b. Most Precambrian organisms lacked hard parts.
2. Cyanobacteria are blue-green algae
 - a. One of the earliest life forms to appear
 - b. Added oxygen to the atmosphere through photosynthesis.
3. Invertebrates and Ediacaran animals appeared late in Precambrian time.

a. Ediacaran animals - _____

B. The Paleozoic Era - about 544 million years ago to about 245 million years ago

1. Many organisms with shells and vertebrates evolved in the warm shallow sea.
2. Amphibians evolved to survive in water and on land.
 - a. Might have evolved from fish
 - b. Could obtain oxygen from gills or from lungs.
3. Reptiles evolved from amphibians to survive farther from water.
4. Several mountain-building episodes occurred during the Paleozoic Era because of plate collisions.
5. Most marine and land species became extinct at the end of the Paleozoic Era.

III. Middle and Recent Earth

A. Mesozoic Era - lasted from 245 to 65 ^{million} ~~billion~~ years ago

1. Pangea separated into Continents and the climate became drier.
2. Dinosaurs evolved; they might have been warm-blooded, travelled in herds, and nurtured their young.
3. Birds, which probably evolved from small, meat eating dinosaurs, appeared during the Jurassic periods.
4. Small, mouse-like mammals, which are warm-blooded vertebrates with hair and milk to feed their young, appeared in the Triassic Period.
5. Gymnosperms, plants that produce seeds but not flowers, appeared in the Paleozoic Era.
6. Flowering plants or angiosperm appeared during the Cretaceous Period.
7. A great extinction, perhaps caused by a comet or an asteroid collision, occurred about 65 million years ago, marking the end of the Mesozoic Era.

B. The Cenozoic Era began about 65 million years ago and continues today.

1. Many mountain Ranges formed, perhaps creating cooler climates worldwide
2. Mammals continued to evolve
 - a. Many species became isolated as the continents continued to separate.
 - b. Homo sapiens, or humans, appeared about 400,000 years ago.