LC

Name Date Class

Note-taking Worksheet

# Geologic Time - Chapter 14 orange Book

## Section 1 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 _____.
   a. Eons—longest subdivision; based on abundance of fossils
   b. Eras—marked by significant worldwide changes in the types of fossils present in rock
   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 rock records.

B. Organic **evolution**—Organisms have changed over time, most likely because of environmental changes.

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; humans use this type of selection when breeding domestic animals
5. New 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.

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## Note-taking Worksheet (continued)

3. Continental collisions formed the giant landmass Pangaea near the end of the Paleozoic Era. These collisions may have dropped sea levels, causing the extinction of trilobites.

## Section 2 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.

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 seas.
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.

## Section 3 Middle and Recent Earth History

A. Mesozoic Era—lasted from 245 to 65 million years ago

1. Pangaea separated into continents and the climate became drier.
2. Dinosaurs evolved; they might have been warm-blooded, traveled in herds, and nurtured their young.

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## Note-taking Worksheet (continued)

3. Birds, which probably evolved from small, meat-eating dinosaurs, appeared during the Jurassic Period.
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 Angiosperms appeared during the Cretaceous Period.
7. A great extinction, perhaps caused by a comet or an asteroid collision, occurred about 65 mya 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.

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Directed Reading for Content Mastery

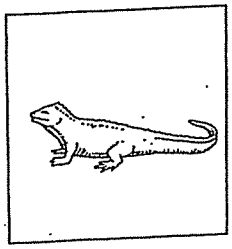
# Section 1 ▪ Life and Geologic Time
# Section 2 ▪ Early Earth History

**Directions:** *Circle the term in parentheses that makes each statement correct.*

1. The longest subdivisions of geologic time are called (epochs, eons).
2. The division of Earth's history into time units makes up the (geologic time scale, trilobite time scale).
3. A group of organisms that reproduce only with members of their group is a (population, species).
4. The process by which organisms that adapt well to their environment survive and reproduce is called (natural selection, organic evolution).
5. Pangaea formed during the (Paleozoic, Mesozoic) Era.
6. A subdivision of eras, called (epochs, periods), are characterized by the types of life existing worldwide.
7. (Fossils, Plates) help scientists divide Earth's history into time units.
8. The changing of organisms over geologic time is known as (natural selection, organic evolution).
9. The oldest rocks on earth contain (only a few, no) fossils.
10. The Precambrian time is the (longest, shortest) part of Earth's history.
11. Cyanobacteria are (colorless, blue-green) bacteria thought to be one of the earliest forms of life on Earth.

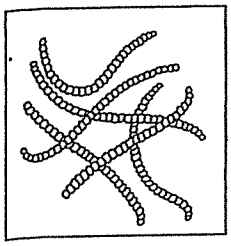
**Directions:** *Write* **A, B, C, D,** *or* **E** *beneath the proper illustration to show in which order they first appeared on Earth.*

Reptile



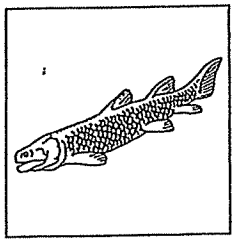
12. E

Cyanobacteria



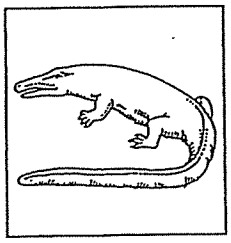
13. A

Fish



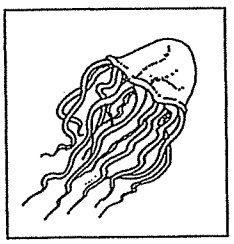
14. C

Amphibian



15. D

Jellyfish



16. B

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# Section 3 ▪ Middle and Recent Earth History

**Directions:** *Use the following terms to fill in the chart below.*

**present** **birds** ***Homo sapiens*** **Pangaea**
**Alps and Himalayas** **dinosaurs** **angiosperms**

| Era | Time Span | Period | Life-forms | Geologic Events |
|---|---|---|---|---|
| Mesozoic | 245 to 65 million years before present | Triassic | The first small 2. Dinosaurs appeared. | 6. Pangaea separated into two large land masses. |
| | | Jurassic | The first 3. Birds appeared. | |
| | | Cretaceous | New plants called 4. Angiosperms evolved. | |
| Cenozoic | 65 million years before present to 1. Present | Tertiary | Dinosaurs became extinct. | 7. Alps begin to rise. Ice Age began. |
| | | Quarternary | 5. Humans appeared. | Ice ages begin. |

**Directions:** *For each of the following, write the letter of the term or phrase that best completes the sentence.*

_____ 8. The Mesozoic Era is also known as the era of _____.
**a.** middle life **b.** new life

_____ 9. Birds appeared during the _____ Period.
**a.** Triassic **b.** Jurassic

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# Key Terms
# Geologic Time

**Directions:** *Draw a line to connect the description on the left to the correct term on the right.*

1. major subdivisions of geological time based on differences in life-forms
2. organisms that lived hundreds of millions of years ago with bodies divided into three sections
3. the longest geological part of Earth's history
4. one of the earliest life-forms, which gave off oxygen
5. flying animals that evolved from dinosaurs
6. the single landmass that once contained all Earth's continents
7. smaller units of time in a geologic period
8. the time period where dinosaurs were the dominant life-form
9. the division of Earth's history into time units
10. the longest subdivisions of geologic time
11. major divisions of an era
12. the change in organisms over time
13. a group of organisms that normally reproduce with other members of their group
14. process by which certain organisms survive and reproduce

Precambrian
geologic time scale
eras
species
trilobites
periods
Pangaea
natural selection
cyanobacteria
eons
birds
organic evolution
Jurassic
epoch

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SECTION 3 Reinforcement

# Middle and Recent Earth History

**Directions:** *Match the descriptions in Column I with the terms in Column II. Write the letter of the correct term in the space provided in the left-hand column.*

**Column I**

F 1. seed plants which first appeared in the Paleozoic Era

H 2. era of "middle life"

E 3. most recent period in the Mesozoic Era

K 4. oldest period in the Mesozoic Era

D 5. northern part of Pangaea

A 6. southern part of Pangaea

Q 7. fast-moving dinosaur

J 8. dinosaur thought to nurture hatchlings

P 9. winged animal resembling both dinosaurs and birds

B 10. milk-producing animals; first appeared in the Triassic Period

G 11. flowering plants

L 12. most recent era

I 13. most recent period in the Cenozoic Era

O 14. climate change that allowed flowering plants to increase

C 15. where most marsupials live

M 16. animals with pouches

**Column II**

a. Gondwanaland
b. mammals
c. Australia
d. Laurasia
e. Cretaceous
f. gymnosperms
g. angiosperms
h. Mesozoic
i. Quaternary
j. *Maiasaura*
k. Triassic
l. Cenozoic
m. marsupials
n. tyrannosaurs
o. cooling
p. *Archaeopteryx*
q. *Gallimimus*

**Directions:** *Complete the following statements.*

17. The bones of cold-blooded animals have _____.

18. The bones of dinosaurs resemble those of _____-blooded animals.

19. Some dinosaurs may have _____ their young.

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