

Natural Selection and Evolution

Name _____

Old Dead Guys (well, most of them):

- A. Briefly explain the most important role of each person in the development of evolutionary theory.
- B. Summarize the main contribution of each one – what did he actually DO?
- C. Tell whether he supported fixity or changing species.
- D. Describe something memorable from his life or work, to help you remember his contribution.
- E. Include ranges of dates for purposes of comparison.

1. Carolus Linneaus

2. Georges Louis LeClerc: Comte de Buffon

3. James Hutton

4. Charles Lyell

5. Jean Baptiste LaMarck

6. Georges Cuvier

7. Thomas Malthus

8. Charles Darwin

9. Alfred Russel Wallace

10. Gregor Mendel

11. Watson and Crick

Natural Selection - Definitions, conditions, factors, and connections.

Population -

Variation (genetic variability) -

Adaptation -

Fitness -

Natural selection -

List and briefly describe the *4 conditions* necessary for natural selection to take place in a population.

1.

2.

3.

4.

List the *4 factors* that drive evolution and briefly describe each.

1.

2.

3.

4.

Explain the role of genetics in determining fitness.

What role does genetics play in natural selection?

Evidence for Evolution

List below the 6 types of scientific evidence supporting evolution as discussed in class. Explain why each is supporting evidence.

1.

2.

3.

4.

5.

6.

Evidence For Evolution: a few more details

Dating Methods: Relative Dating and Absolute Dating

Define these terms:

Stratum -

Law of Superposition -

Radioisotope -

Radioactivity -

Half-life -

Describe absolute dating and relative dating. Explain the difference between the two methods. How are the two methods used together to help us determine the age of rocks and fossils?

Fossil Record

Describe briefly the role absolute dating and relative dating plays in the fossil record.

List 4 inferences that can be made from the fossil record:

1.

2.

3.

4.

Define:

index fossil -

transitional species -

transitional form -

History of the Earth: According to current scientific evidence, list the approximate time for each event.

_____ formation of the Earth

_____ appearance of liquid water

_____ appearance of first bacteria

_____ appearance of cyanobacteria (photosynthesis; adding of O₂ to the atmosphere)

_____ appearance of eukaryotes

_____ appearance of multicellular organisms

_____ marine vertebrates increase in population

_____ primitive fish; first hard body parts

_____ coal swamps, amphibians, insects appear

_____ dinosaurs, plant life, early mammals begin to appear

_____ mass extinction of dinosaurs

_____ plants, insects, birds, mammals begin to dominate

_____ approximate date human forms first present

Biogeography

List two observations based on biogeography that are evidence of evolution.

1.

2.

Comparative Anatomy

Define *homologous structure*

analogous structure

Give examples of each.

Embryology

Define *embryology* and describe its role in our knowledge of evidence for evolution:

Define and give example:

vestigial structure -

Molecular Biology - DNA

Describe the role of DNA and RNA analysis in determining the relationships among organisms.

Explain what is meant by the term *modern synthesis*.