

Name Ms. GRAHAM

Period _____

Review- Evolution

1. What is evolution?

Who was the Father of Evolution?

Charles Darwin

Biological model for history of life on earth. Gradual development (simple → complex) over time. Descent with modification.

2. Describe the following Darwinian terms:

“Descent with modification”

over many generations organisms change into something different. Traits → Parent → offspring.

“Survival of the fittest”

Herbert Spencer: mechanism of natural selection. Biological concept of fitness is defined by reproductive success.

“Evolution through natural selection”

More individuals are produced each generation that can survive. Phenotypic variation exists among individuals and the variation is heritable. Those individuals with heritable traits are better suited to the environment will survive.

3. Describe 5 evidences that support the theory of evolution.

- a. Fossil record
- b. Comparative anatomy
- c. Biogeography
- d. Comparative embryology
- e. Comparative DNA

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4. Define "population".

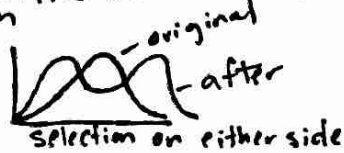
Groups of individuals that belong to the same species that live in the same region at the same time.

5. What does "variation between organisms" mean?

A physical variation between organisms.
 Ex: Black bears range in color depending on habitat
 Humans have varied eye colors

6. Describe the 2 ways that organisms can be selected.

1. Stabilizing selection → select against extreme variation
2. Directional selection → select for phenotypes either end of existing spectrum
3. Disruptive selection → Intermediate unfit!

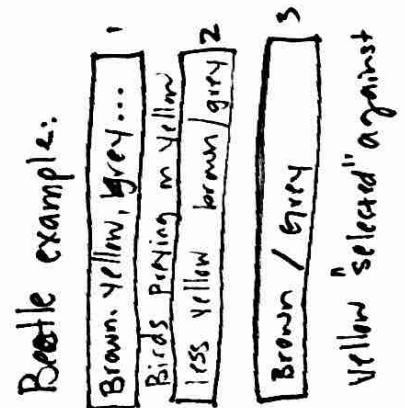


7. What does it mean to have "Biological Fitness"?

Ability to reproduce & pass traits on to offspring

8. Describe the 2 types of pressure.

- a. Artificial — Human interference
- b. Natural — Environment
 - ↳ Adapting to habitat
 - coloration
 - beak size for food
 - example: breeding cows to produce more milk!



9. What is microevolution? Discuss the role of natural selection in microevolution.

Δ within a species or a small group of organisms over a short period of time. Mutation, genetic drift, gene flow (migration) all contribute to evolution happening.

10. What makes up a gene pool?

All genes in a population



Humans -
Nature -

- Selected for or against

Natural / Artificial

Random change in allele frequency!

11. What is genetic drift?

Give 2 examples of genetic drift.

- a. Founder effect
- b. Bottleneck effect

a. ~~gr~~ reduction of genetic variation from original pop.

Ex. lady bug population.

b. sharp lowering of a pop. gene pool due to human or env. causes

Ex. Hunting/poaching; climate change, pollution, etc

12. Calculate the allele frequency in a population. These are the Hardy-Weinberg problems ☺

$$P+q=1$$

$$P^2 + 2pq + q^2 = 1$$

↓ ↓ ↓
homo dominant hetero homo recessive

13. What is macroevolution?

Discuss the role of reproductive isolation in

macroevolution.

Macroevolution: dramatic biological changes. Evident in fossil record.

- Origin of species
- Extinction
- New features!

Reproductive isolation: physical barriers that contribute to reproductive isolation.

- Timing - breeding times
- Behavior - courtship rituals
- Habitat - adapted to env.
- Reproduction - mule = horse + donkey

14. What is speciation? (definition)

Speciation is a formation of new and distinct species. Lineage splitting 2+ separate spp. Reproductive Viability.

What is a speciation event?

A moment in which evolutionary lineage splits starting a new species.

15. What are the major causes of speciation?

Geographic isolation
Reduction of gene flow

16. Compare micro- and macro- evolution.

micro - short time

Macro - long time

17. Describe the differences between taxonomy and cladistics.

Taxonomy - giving names to things. Name relates to classification.

cladistics - method of classification of animals and plants according to the proportion of measurable characteristics they have in common.

18. What is a cladogram?

a. What is an out-group?

The starting point (what everything has in common.) Vertebrae as an example. Further towards the "root".

b. Where do you find the common ancestor?

At the bottom! Most primitive features.

19. What is the relationship between the number of similar traits (genes) when comparing organisms to their ancestor?

organisms share some traits to that of their common ancestor. However,

20. Be able to draw a cladogram!!

