

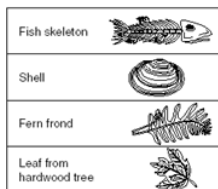
BAT list: Evolution
Chapters 10 & 11

Evolution Unit Vocabulary

Convergent evolution	Evolution	Divergent evolution	Embryology
Biogeography	Genetic drift	Gradualism	Charles Darwin
Natural selection	Vestigial structure	Homologous structure	Gene flow
Analogous structure	Punctuated equilibrium	Speciation	Convergent evolution
Diversity	Mutation	Allelic frequency	

Ch 10.2 Darwin's Observations (pg 290-291 in online textbook)

1. What accounts for the variations among species that Darwin observed? **Adaptations**
2. What is an adaptation? **A change made to better survive – usually involves a trait that is beneficial**
3. What adaptations did Darwin observe in the finches of the Galapagos Islands? **Beak structure changed as food source changed**
4. What is the theory of biological evolution? **Those best fit to survive and reproduce do so**
5. Based on your knowledge of the Law of Superposition, identify A) which fossil is the oldest and the youngest and B) what information can be learned about the environment from the fossils present.



A) **oldest on bottom layer, youngest on top**

B) **the type of environment it was**

6. What could account for fossils of marine organisms being found on top of modern-day mountain ranges? **Area was once covered in water**

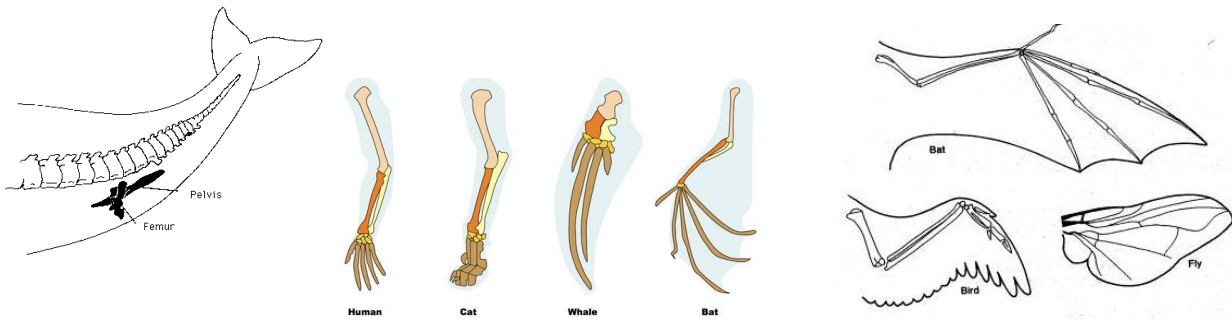
Ch 10.3 Theory of Natural Selection (pg 290-291 in online textbook)

7. What is natural selection? **One trait on a species begins to show up more because it is selected for survival, those that do not benefit are selected to die (eaten, etc)**
8. What is an example of artificial selection (human caused evolution)? **Spraying pesticides resulting in only insects with resistant genes surviving (caused by "natural" selection); poachers killing tusked elephants leaving tuskless to reproduce**
9. Why must there be variation within a population for natural selection to occur? **There has to be a variety of a trait so only certain ones are selected for, leaving the beneficial traits in the gene pool. An example of variation within a species could be rabbits that are different sizes (small, medium, large)**

Ch 10.4 Evidence of Evolution (pg 298-304)

10. Compare homologous, analogous, and vestigial structures. **H- started off same structure in common ancestor then adapted to suit different environments, A- very different structures that have the same function, V- no longer serve a purpose in the organism**

11. Identify the structures below as analogous, homologous, or vestigial.



Vestigial

Homologous

Analogous

12. What type of evidence of evolution is MOST accurate in terms of determining how related organisms are? **DNA**

13. Using the table below, which animal is the least closest related to humans? Explain how you know. **Lemur, it has the most differences**

Amino Acid Sequences in Primates				
Baboon	Chimp	Lemur	Gorilla	Human
ASN	SER	ALA	SER	SER
THR	THR	THR	THR	THR
THR	ALA	SER	ALA	ALA
GLY	GLY	GLY	GLY	GLY
ASP	ASP	GLU	ASP	ASP
GLU	GLU	LYS	GLU	GLU
VAL	VAL	VAL	VAL	VAL
ASP	GLU	GLU	GLU	GLU
ASP	ASP	ASP	ASP	ASP
SER	THR	SER	THR	THR
PRO	PRO	PRO	PRO	PRO
GLY	GLY	GLY	GLY	GLY
GLY	GLY	SER	GLY	GLY
ASN	ALA	HIS	ALA	ALA
ASN	ASN	ASN	ASN	ASN

Ch 11.1 Genetic Variations within Populations (pg 316-317)

14. What is the ultimate source of genetic variation? **mutations**

15. What is allele frequency? **The percent of alleles present, how prevalent or rare a trait is**

16. Why does genetic variation increase the chance that some individuals in a population will survive? **Genetic diversity allows for some genes to be beneficial when others may lead to death.**

17. How does crossing over in meiosis provide a source of genetic variation? **Crossing over "mixes" the genes creating diversity**

Ch 11.2 Natural Selection in Populations (pg 318-321)

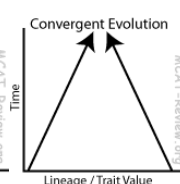
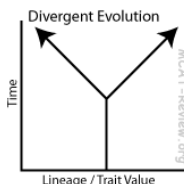
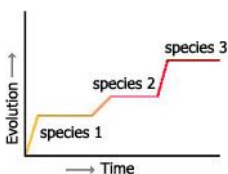
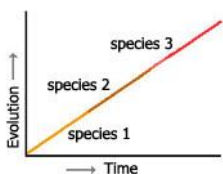
18. Sketch and label each graph for punctuated equilibrium, gradualism, divergent evolution and convergent evolution. Include a short description of each.

Gradualism

Punctuated Equilibrium

Divergent

Convergent



19. Does natural selection produce changes in populations or in individuals and why? **Populations! Individuals don't evolve**

20. Why is it said that natural selection acts on the phenotypes rather than on the genetic material of organisms? **Phenotypes are the actual traits being used for survival, genes just code for them**

Ch 11.3 Other Mechanisms of Evolution (pg 323-325)

21. What is gene flow? **Genes and traits moving from one population to another population leading to genetic variation**

22. Describe how gene flow can increase genetic variation within two neighboring populations. **Different traits are brought in from another population**

23. What is genetic drift? **Change in allele frequency due to randomness in one population.**

24. Explain why mutation and genetic drift are random events while natural selection is not. **There's no regulating which trait is selected for.**

25. Would a population with a lot of genetic variation or a little genetic variation be more likely to have individuals that can adapt to a changing environment? Explain your answer. **A lot, more chance the trait leading to survival exists**

Ch 11.6 Speciation through Isolation (pg 332-335)

26. What is convergent evolution? **Different species develop similar traits allowing them to occupy same niche. (Dolphin & Shark)**

27. What is divergent evolution? **Same or similar species adapting and changing to survive in different environments**

28. Which type of structures (homologous or analogous) are representative of convergent evolution? **analogous**

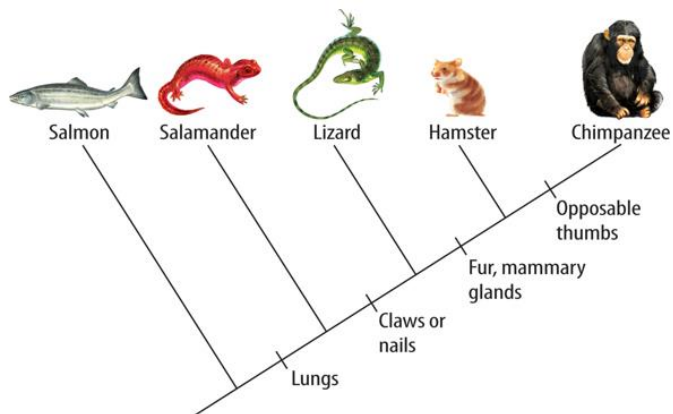
29. Which type of structures (homologous or analogous) are representative of divergent evolution? **homologous**

30. What is co-evolution? **Two species evolving together to continue symbiotic relationship (predator, prey or pollinator and flower)**

31. Explain the theory of gradualism. **Slow and steady changes over a continuous period of time**

32. Explain the theory of punctuated equilibrium. **Long period no change, rapid change, long period of no change, rapid change etc**

33. Use the cladogram below to answer the questions



a. Which organism(s) do not have lungs?
salmon

b. Which organism(s) have fur and mammary glands? **Chimpanzee & Hamster**

c. Would all of these organisms have a common ancestor? **yes** Why or why not?
This cladogram shows none . . .but they do break off the same line

A few other things to review:

Speciation – over a long period of time a single species develops into several different species. May occur when portion of population is isolated

Evidence of Evolution showing we came from a common ancestor:

Embryology

Fossil Record

DNA comparison

Biogeography

Anatomical structures (homologies)

Gel Electrophoresis:

Restriction Enzymes are used to cut DNA (enzymes end in – ase)

The more bands/bars in common the closer the relationship, the less the further the connection

Used for paternity tests, identifying suspects, etc