APES Mr. M-B

Name _____

Period ___ Date ___/___/___

Unit 3: Guided Notes (Chapter 5 and 18) – Part 1

Evolution of Biodiversity (Ch. 5)

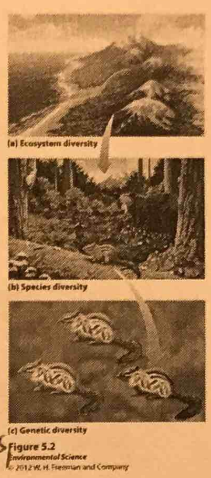

Figure 5.2
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1. Describe the 3 levels of biodiversity and the why each is important.
   a. Ecosystem diversity- the variety of ecosystems within a given region.
   b. Species diversity- the variety of species in a given ecosystem.
   c. Genetic diversity- the variety of genes within a given species.

Know these and their definition.

IMPORTANCE OF EACH?

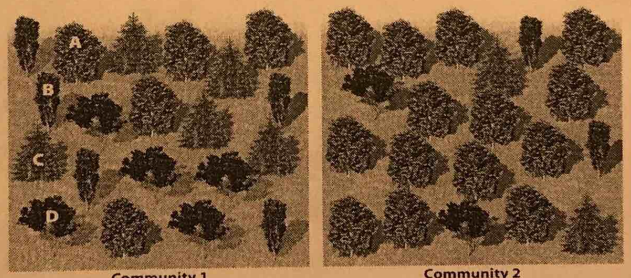
All 3 levels of diversity give populations of organisms, ecosystem, or entire regions more resilience to disease, drought, natural disasters etc.

key word

2. Contrast 2 ways we can measure species diversity and be familiar with each. What index combines these two metrics?
   a. Species richness- the number of species in a given area.
   b. Species evenness- the measure of whether a particular ecosystem is numerically dominated by one species or are all represented by similar numbers of individuals.

Contrast the richness and evenness of the 2 forest ecosystems below:

These communities have equal species richness but Community 1 has greater species evenness.



Community 1
A: 25% B: 25% C: 25% D: 25%

Community 2
A: 70% B: 10% C: 10% D: 10%

Figure 5.4
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3. What is the biological definition of a species?

A group of organisms that can reproduce with one another to produce fertile offspring.

4. How does evolution work? Describe the 3 main mechanisms including natural selection, artificial selection and genetic drift.

Major objective

Background – Important Vocabulary ← Must understand to understand the mechanisms

- Evolution - the change in the genetic composition of a population over time.
- Genes- locations on a chromosomes which codes for a protein
- Alleles: form of a gene
- Genotype- the complete set of genes in an individual.
- Gene pool – set of genes in a population
- Phenotype- the actual set of traits expressed in an individual.
- Mutation- a random change in the genetic code.

3 Major mechanisms of evolution

Know these! More detail on each below.

a. Natural selection- the environment determines which individuals are most likely to survive and reproduce. (Survival of the fittest!)

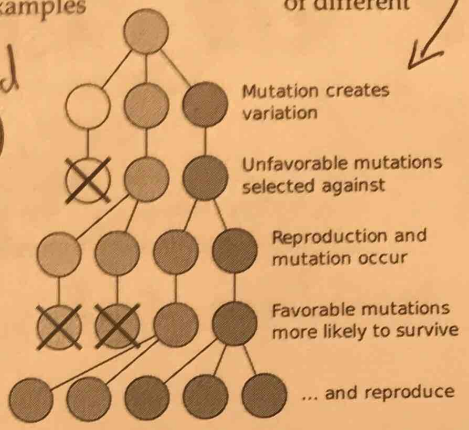
b. Artificial selection- when humans determine which individuals breed.

c. Genetic Drift Evolution by random processes

5. Describe the process of natural selection and give examples of different sub-types of natural selection.

Check this out.

Organisms that are better adapted to survive and reproduce (fitter) produce more offspring.



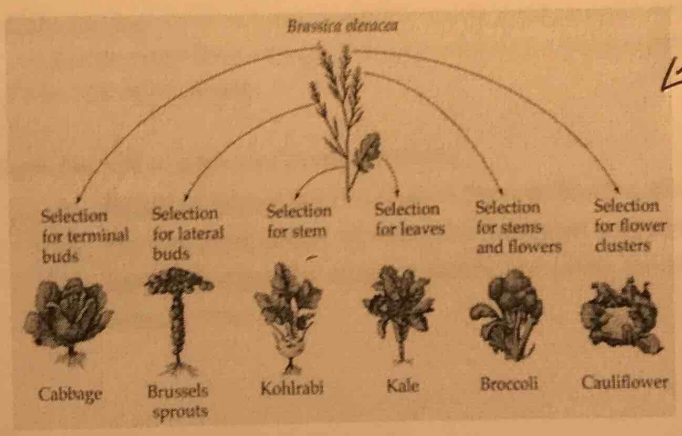
Sub-types:

Will review in class

1. Predation selection
2. Physiological selection
3. Sexual selection

6. What are some examples of artificial selection?

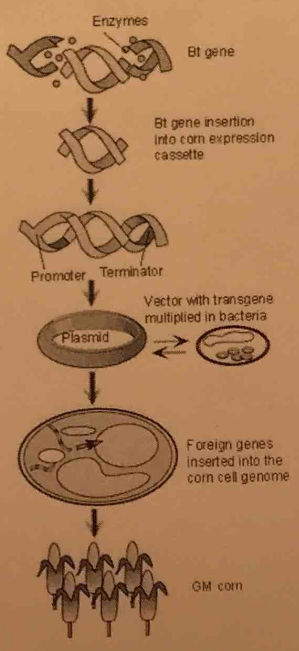
All these goodies from the same parent species!



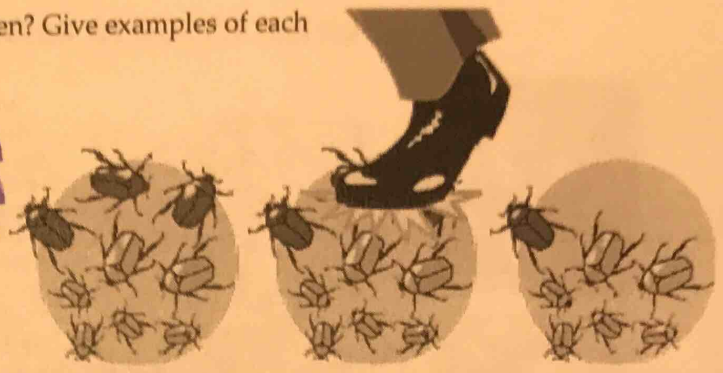
Other examples? Dogs!

Will discuss later

Debate: Are genetically modified organisms (GMOs) and example of natural selection?



7. What are 2 ways that genetic drift can happen? Give examples of each discussed in class.



Genetic drift- the random change in the genetic composition of a population over time due to a skewed allele frequence in a small population

a. Bottleneck effect- a reduction in the genetic diversity of a population caused by a reduction in its size.
Examples: The lack of genetic diversity in Cheetahs due to 2 bottlenecks (1st on an ice age and 2nd overhunting)

b. Founder effect - a change in a population descended from a small number of colonizing individuals.
Examples: Polydactylism in Amish populations.

Will review in class →

STOP

8. Describe the niche concept using the words fundamental niche vs realized niche and why organisms don't ever occupy the same niche (i.e. the competitive exclusion principle). Draw out an example

Niche – the role of a species in an ecosystem.

a. Range of tolerance- The limit to the conditions a species can tolerate
b. Fundamental niche- the ideal conditions for a species.
c. Realized niche- the range of abiotic and biotic conditions under which a species actually lives.