Science 10 Name:_____

Mr. Korbutt Blk:_____ Date:_____

Natural Selection Notes

Objectives

- Know how Natural Selection impacts the diversity of life.
- Understand and be able to describe how the following relate to / impact natural selection
    - Adaptive Radiation
    - Selection Pressure
    - Adaptation
    - Extinctions

What is Biodiversity?

- Biodiversity is the _____ of plants, animals, and micro-organisms.
- Biodiversity is often used as an indicator of how _____an ecosystem is. The more plants and animals that can be supported within an ecosystem, the healthier it is.
    - The three levels of biodiversity are:
        1. _____ diversity
        2. _____ diversity
        3. _____ diversity

Ecosystem Diversity

- Is the variety of ecosystems within a particular region of the biosphere
- Describes biodiversity at the **largest scale**
- Includes the _____ (living: plants, animals) and _____ (nonliving: climate, pH, soil/water chemistry, latitude, light levels) components
- Two main varieties of ecosystems on earth are _____ and _____ ecosystems

Species Diversity

- Is the variety of species within a particular region, which can vary from a small habitat to the entire earth.
- Describes biodiversity at a **medium** level
- A _____ is a group of organisms that can interbreed in nature and produce fertile offspring
- Scientist have described around 2 million species and estimate there are anywhere from 5 million to 100 million species, most of which are microorganisms and insects

Genetic Diversity

- Is the _____ in the _____ of individuals of a particular species
- Describes biodiversity on the smallest scale
- **_____ in DNA produce _____ _____ within a population**
- _____ control the expression and inheritance of _____.
- Differences in _____ result in variation in individuals in a _____
- A **Population** are members of the same species living in the same geographical area and time

- The Earth's rich ecosystems a due to the _____ between the wide variety of Earth's species (biotic) and the highly varied physical and chemical factors (abiotic)

Species exist and thrive in all of Earth's ecosystems because of genetic diversity and factors that effect the gene pool …._____

What is Natural Selection

- Natural Selection along with mutation, migration and genetic drift is one of the mechanisms

of _____

- Natural Selections is the process where environmental factors favour the selection of _____ individuals.
  - In evolutionary terms, _____ refers to reproductive success and how well an organism is adapted to its environment.
- This process results in a _____ in the frequency of _____ (and the _____ they code for) in a _____ over _____.
- This theory was proposed by _____

Selection Pressure

- Natural selection is _____. It doesn't have a plan, purpose or direction.
- Selection pressures are _____ or _____ environmental factors which may decrease reproduction in a species population and contribute to evolutionary change or even extinction through natural selection
- When the environment changes, those individuals with alleles that allow them to survive and reproduce are a _____ _____ and are "_____ _____"
- Individuals that lack the required characteristics that would allow them to survive will die, and their genes will not be available in the population. These individuals are "_____ _____" by the environment.

Adaptations

- Environments are often identified with characteristic biotic factors, such as cactus in the desert or caribou on the tundra.
- _____ are characteristics that help organisms _____ and _____ in their environment.
- There are 3 types of adaptations:

1) Structural

- Any _____ features of an organisms body having a specific function that allows that organism to have _____ ability to survive.

2) Physiological

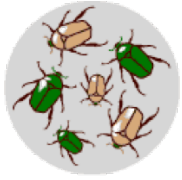
- Any _____ or _____ _____ within an organism that allows it to survive.

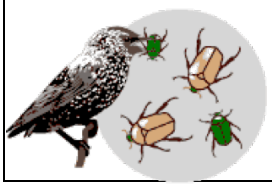
3) Behavioural

- Any _____ that the organism does in order to survive and reproduce in its environment.
- These may include feeding, mating, care for young, migration, hibernating, protection, etc.

How Natural Selection Works

- 1.There must be _____for natural selection to occur.
- Natural selection only acts on the _____ among individuals.
- Examples of traits that show phenotypic variation
  - Height
  - Colour of skin/hair/eyes
  - shape of nose / curve of lips
  - Colour and shape of shells
    - ex. Some beetles are green and some are brown





- **2. _____ and _____**

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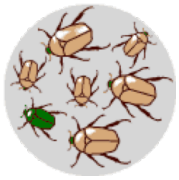
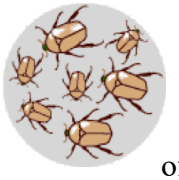
- Darwin called it the "struggle for survival"
- There is _____. Since resources (food, water, space, access to mates) are scarce and can't support unlimited population growth.
- Ex. green beetles tend to get eaten by birds and survive less often than brown beetles do
- 3. There is _____.
- Ex. The surviving brown beetles produce brown offspring because the trait has a genetic basis.



- 4. The end result: The more _____ trait, becomes more _____ in the population. Result is a _____ better _____ to their environment.



- Individuals with unfavourable characteristics have less chance to reproduce and pass along their heritable traits. Those alleles will _____ in the population.
- Example: brown colouration, which allows for the beetle to have more offspring, If this process continues, eventually, all individuals in the population will be brown.

Peppered Moth: Natural Selection in Action

In England in the 19th century there are two different colour variations of the peppered moth: light coloured (_____) and dark coloured (_____).

- In the daytime, moths hang out: resting on the bark of oak & birch trees.
- Tree bark colour: light brown speckled with green.
- Then... the Industrial Revolution!

_____ (from soot from burning coal) affected trees by staining the tree trunks dark brown.

- Biologists noticed that population of moths was changing and *that there were more moths with dark colouration*.
- Evolutionary theory would hypothesize:
  The major predator of the moth: _____
  How birds locate prey: _____
  Moths that blend in w/their surroundings are said to be _____.
  As tree trunks darkened the colour variant the birds favoured changed from the dark coloured moths to the light coloured moths.

Now, the dark moths were more _____ and more of them _____ and got a chance to _____, passing on their _____ for dark colour of their offspring.

Do Individuals evolve/adapt?

- _____ individuals can ever evolve!
- Physical, physiological or heritable behaviour must be obtained through reproduction
- Only _____ of species can evolve over time.

Assignment

- Read p. 17-18, 47-57
- Workbook Ch 1.3 p. 34/35.
- Peppered Moth Simulation Due:_____
- Optional: Answer questions on bottom of textbook p. 49 and 53