

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_



# YEAR 10 EVOLUTION

## JUNIOR SCIENCE

<p><b>Lecture 1</b> <i>History of Evolution</i></p>	<ul style="list-style-type: none"><li>• Understand the fundamentals of biodiversity and its vital role in evolution</li><li>• Define and briefly describe genetic diversity in relationship to evolution</li><li>• Understand three main evolutionary theories and the observations that supported the scientists' theories</li></ul>
<p><b>Lecture 2</b> <i>Natural Selection</i></p>	<ul style="list-style-type: none"><li>• Understand how natural selection involves defined stages to phase out a species not adapted to a changing environment</li><li>• Explain the relationship between variation within a population and the genetic differences that arise as a consequence.</li><li>• Illustrate and annotate genetic variation through a case study</li><li>• Discuss the stages of evolutionary change with reference to a case study</li><li>• Evaluate the differences between divergence and convergence with reference to a case study and explain how each is significant in speciation</li><li>• Identify and define co-evolution and its long lasting effect on the relationships between organisms.</li></ul>
<p><b>Lecture 3</b> <i>Evidence for the Theory of Evolution</i></p>	<ul style="list-style-type: none"><li>• Understand the various methods of finding evidence for the theory of evolution by natural selection</li><li>• Explain the properties and evaluate all the techniques relative to their effect on our modern understanding of evolution</li><li>• Understand the two main forms of radiocarbon dating and how different geographies affect them.</li><li>• Assess the ways fossils are observed upon excavation and explain how they are formed.</li></ul>



<p><b>Lecture 4</b> <i>Molecular Biology in Evolution</i></p>	<ul style="list-style-type: none"><li>• Describe protein production in terms of the various processes that precede the actual protein.</li><li>• Explain technologies used to understand the closeness of organisms in a phylogenetic tree</li><li>• Understand the process of DNA sequencing and its uses</li></ul>
<p><b>Lecture 5</b> <i>Evolution of Organisms</i></p>	<ul style="list-style-type: none"><li>• Evaluate how plausible various explanations of extinction events are in terms of modern evolutionary and archaeological understanding</li><li>• Understand the main modern causes of extinction of wildlife and strategies involved in preventing extinction</li></ul>

NGO&SONC



## **INTRODUCTION TO EVOLUTION**

### **Biodiversity**

- Biodiversity is simply the .....  
.....
- The larger the variety, the .....  
.....  
.....
- For example: A marine ecosystem thrives because of a balance between predators and prey, but overfishing reduces the prey for bigger organisms such as sharks and hence biodiversity is reduced and the ecosystem is affected.

### **Evolution**

- Biodiversity is the .....
- Biodiversity can be described in terms of:
  - ..... diversity:
    - The .....
  - ..... diversity:
    - .....

### **Genetic Diversity**

- Every organism has genes, which is a ..... that tells the body how to develop or grow. Within a species, there may be .....  
.....
- Genetic variation can occur due to:
  - .....: When genetic material from two parents are combined, the .....
  - .....: When there is .....



## DEVELOPMENT OF THE THEORY OF EVOLUTION

Three theories:

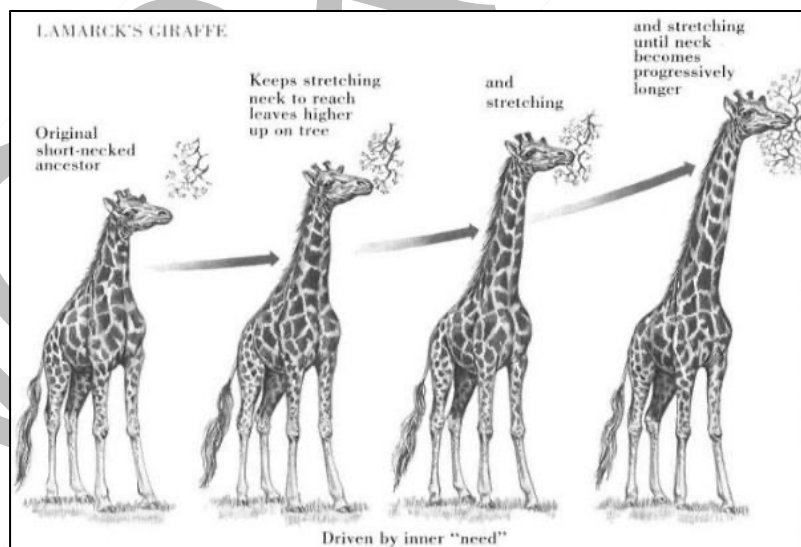
1. Lamarckian Theory
2. Darwin's Theory of Evolution
3. Wallace's Theory of Evolution

### 1. Lamarckian Theory

- ....., was a French naturalist who believed in evolutionary change.
- He is known for his .....

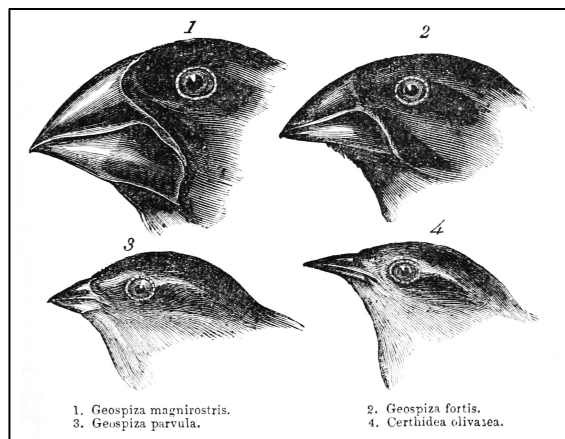
*“Organisms can develop characteristics during its lifetime in order to adapt to its environment – these changes will be passed on to offspring”*

- This suggests organisms will .....
- E.g. a giraffes have stretched their necks to reach food, which was passed to their offspring, resulting now to giraffes with long necks.

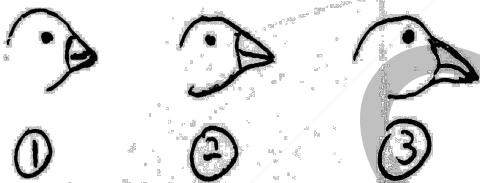


## 2. Darwin's Theory of Evolution

- ....., was an English naturalist who read the works of Lamarck and was inspired by the thoughts of evolution.
- He travelled to the ..... Via the HMS Beagle to observe ecosystem and wildlife on different islands.
- Darwin's Finches:
  - Finches are birds that were found on these islands
  - There were ..... representing a new species.



E.g.



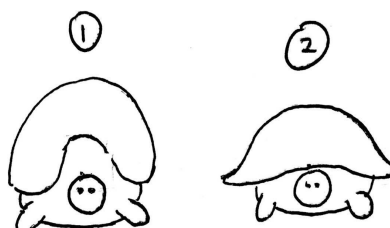
1: .....

2: .....

3: .....

### Darwin's Tortoises

- There were two types of islands; .....
- Tortoise shells varied depending on habitat, representing a new species



1: .....  
.....  
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2: .....  
.....  
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**Darwin's Publications**

- Through Darwin's observations, he published about his theory of evolution:
  - .....
  - .....
  - .....
- He referred to evolution as a .....
- E.g. all organisms come from a ..... and over time they change and begin to .....
- Darwin also published ..... to describe the process of evolution.

**3. Wallace Theory of Evolution**

- ..... was another naturalist working at the same time as Charles Darwin. Instead of travelling the islands, he explored the Asian countries of:
  - Malaysia
  - Indonesia
- He ..... of many insects, shells, bird skins, mammals and reptiles.
- Wallace is known for discovery of the .....: An .....
- He spotted .....
  - E.g. there is nothing close to a kangaroo in Asia.
- Ultimately, he returned to **propose the theory of:**  
.....  
.....  
.....





### Questions

1. When lions prey on a herd of antelope, some antelope are eliminated. Which part of Darwin's theory of evolution may be used to describe this situation?
  - a) Acquired characteristics
  - b) Survival of the fittest
  - c) Speciation due to mutations
  - d) Convergent evolution
2. Charles Darwin and Alfred Russell Wallace were the first to:
  - a) Explain the source of the natural variation occurring within a species
  - b) Propose the idea of natural selection to explain how organisms evolve
  - c) Challenge the ideas of biodiversity
  - d) Suggest that characteristics acquired during a lifetime could be passed on to offspring
3. Which other scientist's work influenced Darwin's ideas?
  - a) Lamarck
  - b) Attenborough
  - c) Wallace
4. A scientist put 200 flies into a seal container and sprays insecticide into the container. 150 flies die soon after and 50 survive. The surviving flies then mate and produce offspring which brings the total population to 200 again. The experiment is repeated again, and 175 flies survive. Explain what has occurred.

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5. Which of the following is NOT a part of Darwin’s theory of natural selection?
- a) Individuals of a population will vary
  - b) Organisms tend to over – reproduce themselves
  - c) There are limited resources for which individuals compete
  - d) Modifications an organism acquires during its lifetime can be passed to its offspring
  - e) Variations possessed by individuals of a population are heritable
6. According to Darwin’s theory of evolution, what causes the struggle for survival in populations?
- a) Overproduction of offspring
  - b) Favourable heritable variations
  - c) Natural selection
  - d) Competition between the fittest individuals in the population

**Summary**

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