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| --- | --- | --- |
|  | Statement | Guidance |
| 5.2.NOS: | Use theories to explain natural phenomena- the theory of evolution by natural selection can explain the development of antibiotic resistance in bacteria |  |
| 5.2.U1 | Natural selection can only occur if there is variation among members of the same species. |  |
| 5.2.U2 | Mutation, meiosis and sexual reproduction cause variation between individuals in a species. |  |
| 5.2.U3 | Adaptations are characteristics that make an individual suited to its environment and way of life. |  |
| 5.2.U4 | Species tend to produce more offspring than the environment can support. |  |
| 5.2.U5 | Individuals that are better adapted tend to survive and produce more offspring while the less well adapted tend to die or produce fewer offspring. |  |
| 5.2.U6 | Individuals that reproduce pass on characteristics to their offspring. | Students should be clear that characteristics acquired during the lifetime of an individual are not heritable. The term Lamarckism is not required. |
| 5.2.U7 | Natural selection increases the frequency of characteristics that make individuals better adapted and decreases the frequency of other characteristics leading to changes within the species. |  |
| 5.2.A1 | Changes in beaks of finches on Daphne Major. |  |
| 5.2.A2 | Evolution of antibiotic resistance in bacteria. |  |

**Essential Idea: The diversity of life has evolved and continues to evolve by natural selection.**

5.1.U1: Evolution occurs when heritable characteristics of species change

Scientific definition of theory

Scientific definitation of evolution

5.2 U1: Natural selection can only occur if there is variation among members of the same species.

* Typical populations have variations - height, colouring, size, etc
* Natural selection depends on variation within populations
* If all populations were identical, there would be no way for certain features to be favoured over others.

5.2 U2: Mutation, meiosis and sexual reproduction cause variation between individuals in a species.

In order for natural selection to take place the following must occur… There must be variation within individuals of a species (5.2 U1)

Variation can arise from 3 factors…

1. Mutation
2. Meiosis
3. Sexual Reproduction:

5.2 U3: Adaptations are characteristics that make an individual suited to its environment and way of life.

Adaptations within species allow for natural selection and better suit some organisms for their environment. What is a key point to remember?

5.2 U4: Species tend to produce more offspring than the environment can support.

The overproduction of offspring in most organisms leads to increased competition and therefore a struggle for survival.

5.2U5: Individuals that are better adapted tend to survive and produce more offspring while the less well adapted tend to die or produce fewer offspring.

Example: Giraffe

5.2 A1: Changes in beaks of finches on Daphne Major.

Galapagos Finches

Read pg. 254+255 and complete the activity on page 255 on Finches on Daphne Major

<http://bguile.northwestern.edu/env/finch.html>

5.2 A2: Evolution of antibiotic resistance in bacteria.

Antibiotic resistance:

<http://www.cdc.gov/drugresistance/about.html>

Use the following website to answer the following questions.

1. What is antimicrobial resistance?
2. How does it occur?

**Data-based Questions: Galapagos Finches**

SELF ASSESSMENT

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Essential Biology** | | | **Assessment** | |
| **Criterion** | **Complete (2)** | **Partially complete (1)** | | **Self** | **Teacher** |
| Presentation & Organisation | NA | File names sensible, work complete and well-presented. Sentences are complete and include vocabulary. All command terms highlighted or underlined. | |  |  |
| Academic Honesty | NA | Sources cited using mla method, with Works Cited section complete and correct. | |  |  |
| **Objective 1** understanding | **All** answers for the following command terms correct: | Most answers for the following command terms correct: | |  |  |
| **Define Draw Label List Measure State** | | |
| **Objective 2** understanding | **All** answers for the following command terms correct: | | Most answers for the following command terms correct: |  |  |
| **Annotate Apply Calculate Describe Distinguish Estimate Identify Outline** | | |
| **Objective3**  understanding | **All** answers for the following command terms correct: | | Most answers for the following command terms correct: |  |  |
| **Analyse Comment Compare Construct Deduce Derive Design Determine Discuss**  **Evaluate Explain Predict Show Solve Sketch Suggest** | | |
| Logic, notation, mathematical working | NA | Answers are presented in a logical and concise manner. SI units used most times, with correct unit symbols and definitions of terms. All mathematical working shown. | |  |  |
| Further research | NA | Evidence is apparent of research and reading beyond the textbook and presentations to find correct answers to challenging questions. If any questions are unanswered, this criterion scores zero. | |  |  |
|  | **Total (max 10):** | | |  |  |