**Mendelian Genetics**

|  |  |
| --- | --- |
| **Focus and Review** | Students respond to a mix of lower-order remembering/identifying and higher-order critical thinking multiple choice questions to review prior content. During discussion of responses, students are probed for understanding (ie. how they chose their answer, why other responses are incorrect, how they remembered the content, etc.). |
| **Objective/**  **Goal** | Objective 3.03 Interpret and predict patterns of inheritance.   1. *3.03a Dominant, recessive, and intermediate traits* 2. *3.03h Punnett squares* 3. **3.03f Test cross** |
| **Instructional Presentation** | Students will review important vocabulary for understanding genetics.  Teacher will orient students to SAS Curriculum Pathways (username, getting to the activity, etc).  <http://www.sascurriculumpathways.com/ProductEntrance/InterActivities/science/biology/genetics/MendelianGenetics/scope.jsp> |
| **Guided Practice** | Students explore Punnett squares showing the genotype using SAS Curriculum Pathways’s Vlab Mendelian Genetics. |
| **Independent Practice (Exploration)** | Students must develop a method to effectively determine the genotype of the unknown parent using just one matting. They will generate a lab report on wikispaces. |
| **Term Introduction** | Students will present their methods which will lead to a discussion of the theory behind **test crosses**. |
| **Concept Application** | The class will identify another unknown applying the concept of test crosses. |

# Butterfly Genetics Lab

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## Instructions:

Using the applet,

<http://www.sascurriculumpathways.com/ProductEntrance/InterActivities/science/biology/genetics/MendelianGenetics/scope.jsp>, complete this lab report by exploring how we can use probability to predict traits and ultimately discover the genotype of unknown parents. You may alter this lab report to include tables, spreadsheets, multimedia, images, etc. to help you explain your findings. Both you and your lab partner should be collaborating on this document simultaneously.  
  
*Keep in mind that you will share your results with the class.*

**Background information**

Use the "Show Genotype" tab to make some observations about butterfly genetics.

Record your observations in the table below.

*Table 1: Genetic Traits of Butterflies*

|  |  |  |  |
| --- | --- | --- | --- |
| **Trait** | **Phenotype** | **Genotype** | **Alleles** |
| Wing Size |  |  |  |
|  |  |
| Antennae |  |  |  |
|  |  |
| Color |  |  |  |
|  |  |
|  |  |
| Dots |  |  |  |
|  |  |
| Wing Edge |  |  |  |
|  |  |

Practice a few crosses. Be sure to only check one characteristic at a time.

**The Challenge:**

Your task is to develop a method to determine the genotype of an unknown butterfly using as few crosses as possible for each characteristic. Can you do it with just one cross?

How do you think you can do it?

**Procedure :**

(Number each step) - Be sure to write your procedure clearly so that even your grandmother could follow the steps and repeat your experiment.

**Results** (Data Table):

*Table 2: Identifying the Unknown Butterfly #*

|  |  |  |
| --- | --- | --- |
| **Trait** | **Phenotype** | **Genotype** |
| Wing Size |  |  |
| Antennae |  |  |
| Color |  |  |
| Dots |  |  |
| Wing Edge |  |  |

**Observations** (What happened during the experiment? Describe the outcomes of the crosses.):  
  
  
**Conclusions** (Summarize how to identify an unknown parent in just one step for each characteristic.):