Biology from Hawaii Name

2014

**Speciation Game**

**Introduction**

Cladograms show the history of evolution. One ancestral species evolves into many descendant species. Every time a branch forks, one species became two; this is called **speciation**. But how can one species split and evolve into two different species?

**Procedure**

Students act as moths with only one thing on their minds: reproduction!

1. Each student randomly chooses 2 checkers to represent their genes.

 *Red*–*Red* = moist belly that absorbs oxygen from water; **survives flash floods**

 *Red–Black* = dry, scaly belly; **dies in both flash flood and droughts**

 *Black–Black* = dry, solid belly that is completely waterproof; **survives droughts**

2. Count and record the initial number of red and black checkers in the class. Calculate the proportion of red checkers (#red/total).

3. Genes are secret. Keep the checkers hidden in your palms.

4. Roam around the classroom to find a mate.

5. When moths meet and want to reproduce, they each trade one checker. Pick a hand.

6. After trading, you become the new, baby moth. Continue reproducing, keep your genes alive!

7. Round I: a large, diverse island. Roam around the entire classroom as a single population. Mate with any other moth. Periodically, **flash floods** or **droughts** will kill moths in different areas of the classroom.

8. Round II: two small islands. Divide the class into two isolated populations. One population will reproduce on a wet island with periodic **flash floods**. The other population will reproduce on a dry island with periodic **droughts**.

9. Count and record the final number of red and black checkers in each population. Calculate the proportion of red checkers (#red/total).

**Results**

Graph 1: single large population

 1.0

 0.5

 0.0

Round I: *record and graph change in the proportion of red checkers (#red/total)*

 Initial proportion of red checkers

 Final proportion of red checkers

Graph 2: two isolated populations

 1.0

 0.5

 0.0

Round II: *record and graph change in the proportion of red checkers (#red/total)*

 Initial proportion of red checkers

 Final proportion of red checkers

**Discussion**

1. Describe the importance of **isolation** in making new species. Use Hawaii as an example.

|  |  |  |
| --- | --- | --- |
| **Grading** | points worth | points earned |
| **Participation**actively circulate and trade checkerskeep genes (checkers) hidden from viewhonestly capitulate when disaster strikes | **1** |  |
| **Results**accurately record the various proportions of red checkersbar graph includes axis labels | **2** |  |
| **Discussion**thoughtful answers use vocabulary from the class/reading | **2** |  |
| **Total** | **5** |  |