

Evolution of Candy Project

Using fifteen of the specimens you received, write a report on the evolutionary history of the kingdom *Mellitus* (Latin for “sweet” or “honey”).

Your report should include the following information:

1. A phylogenetic tree showing the speciation of candy over time. This project is based on your explanations for the placement of the candies, so make sure that you can justify your choices scientifically. Use the pattern of the phylogenetic tree found on page 477 of your textbook. (Different patterns may be used, but you must receive prior approval.)
2. A description of the characteristics used to place each of the species in its place. You should include at least one example for each of the following:
 - a. homologous structures
 - b. molecular similarities
 - c. internal similarities
 - d. DNA sequences (you make up, but base them on real organic compounds)
 - e. embryological development (you make up, but should be logical)
 - f. reproductive patterns
3. Kingdom, phylum, genus and species names for your candies. Assume that all species featured in this lab are members of the same kingdom, but it is up to you to decide on the rest of the Linnaean classification. You may want to use a Latin dictionary.
4. A written explanation of your tree, containing the following parts:
 - a. The particular environments to which five of the species are adapted, and the adaptations that enable the species to thrive.
 - b. Vestigial organs
 - c. Convergent evolution
 - d. Divergent evolution
 - e. examples of two of the modes of gene selection:
stabilizing, directional, or disruptive
 - f. examples of two of the following isolation barriers:
temporal, habitat, behavioral, mechanical
 - g. identify three species that show allopatric speciation
 - h. identify two species that show sympatric speciation
 - i. identify three species that show adaptive radiation
 - j. 5 other candies (not in the original 15) that show variation within a species
5. Vocabulary to include
 - a. species
 - b. speciation
 - c. population
 - d. natural selection
 - e. adaptation
 - f. mutation
6. Other points
 - a. Neat
 - b. Colorful with pictures

Your report should be 4-6 pages.

BE CREATIVE, but be sure it's PLAUSABLE

Pre-project Questions

1. List the levels of classification starting with the largest to the smallest.
2. What is binomial nomenclature?
3. Explain each of the following concepts:
 - natural selection*
 - adaptive radiation*
 - punctuated equilibrium*
 - gradualism*
 - divergent evolution*
4. List 2 animals, 2 plants, 2 protists, 2 fungi, and 2 bacteria, each with two adaptations that they have to help them to survive in their environment. (Relate adaptation to environment.)
 - animals*
 - plants*
 - protists*
 - fungi*
 - bacteria*
5. What are homologous structures? Give two examples with explanations.
6. What are vestigial organs? Give two examples with explanations.
7. What is convergent evolution? Give two examples with explanations.
8. What is coevolution? Give two examples with explanations.
9. Using real organisms, give examples of each of the modes of gene selection:
 - stabilizing*
 - disruptive*
 - selective*

Grading Rubric (150 pts.)

name:

item	your points	teacher points
phylogenetic tree: complete with 15 different species	5	5
logical	5	5
correct format	5	5
description of classifying characteristics: complete with 15 different species	15	15
logical	5	5
CONCEPTS USED:		
homologous structures	2	2
molecular similarities	2	2
internal similarities	2	2
DNA sequences (real organic compounds)	2	2
embryological development (logical)	2	2
reproductive patterns	2	2
scientific names for 15 different species:		
phylum	5	5
genus and species (written as scientific names)	5	5
correct format (italics, capital k, p, and g)	5	5
The particular environments to which five of the species are adapted, and the adaptations that enable the species to thrive.	10	10
Vestigial organs (two examples)	2	2
Convergent evolution (two examples)	2	2
Divergent evolution	2	2
examples of two of the modes of gene selection: stabilizing, directional, or disruptive	2	2
examples of two of the following isolation barriers: temporal, habitat, behavioral, mechanical	2	2
identify three species that show allopatric speciation	3	3
identify two species that show sympatric speciation	2	2
identify three species that show adaptive radiation	3	3
5 other candies (not in the original 15) that show variation within a species	5	5
Vocabulary included:		
a. species	1	1
b. speciation	1	1
c. population	1	1
d. natural selection	1	1
e. adaptation	1	1
f. mutation	1	1
Neat	5	5
Spelling and grammar	5	5
Colorful (with photos)	5	5
QUESTIONS	35	35
EXTRA CREDIT (up to +10)		