

## Layer 3 Options and Grading Criteria

### CHOOSE 1 - Either Design an experiment OR create a PowerPoint

#### 1) Design an experiment options:

- A particular tropical fish has a rather drab body, but the males have a few colored spots on their sides and tails. Design an experiment to determine if artificial selection can be used to develop a more brightly colored variety.
- To determine if a new antibiotic will be successful in fighting various strains of bacteria. Make sure to discuss in your conclusion the long term effects and consequences of adopting the new antibiotic in respect to the theory of evolution.
- Biologists discovered two populations of frogs that look similar. The populations are separated by the Amazon river. What experiment could be designed to test whether the two populations are one species or two? Make sure to discuss how speciation typically occurs.

#### *What you need:*

\_\_\_\_(10 pts) Introduction:

- \_\_\_\_ (2 pts) Background on the experiment
- \_\_\_\_ (2 pts) Hypothesis (If, then, because)
- \_\_\_\_ (2 pts) Independent Variable (What you change)
- \_\_\_\_ (2 pts) Dependent Variable (What you measure)
- \_\_\_\_ (2 pts) Constants

\_\_\_\_ (5 pts) Materials List

- You have unlimited resources to complete this experiment, what do you need?

\_\_\_\_ (5 pts) Procedures

- Step by step outline of how you would set up and carry out the experiment

\_\_\_\_ (5 pts) Expected Results (data table, graph, 1 paragraph explanation)

- If you performed this experiment, what do you think would happen? Why?

\_\_\_\_(5 pts) Discussion/Conclusion (2 paragraphs)

- What is the overall conclusion that can be drawn from this experiment?  
What future experiments could be done to follow up on your work?

## **2) Create a PowerPoint options:**

-Show a timeline of the changes and additions to the theory of evolution from the 1800's to the present. You can also include important court cases.

-For a great resource google: "Evolution Revolution" and click the first result

*For each slide:*

- A description and picture of the event
- 2 sentences on the effects of this event

-Discuss the relevance of evolution to the field of medicine, focus on the fight against diseases caused by bacteria and viruses. Include any relevant pictures you find.

*Include information on:*

- The background of germ theory and the introduction of bacteria and viruses to the field of medicine
- Why evolution is important when dealing with antibiotics and the bacteria they are designed to kill
- What we can do now to slow down the evolution of bacteria and viruses
- How does evolution make HIV so hard to find a cure for?

***What you need:***

\_\_\_\_ (30 pts) 10 slides

\_\_\_\_ (3 pts/slide) 3 bullets/sentences on each slide (and a heading)

***\*If you have an idea for a project not listed (write a song, make a movie, etc.) make sure you clear it with me first so we can decide on how it will be graded.***