Name: _____

Date: _____ Per: _____

Evolution Webquest

In this webquest you will be exploring evolution and the mechanisms that drive evolution. You will use three websites to answer the following questions and complete this packet. Answer the questions on binder paper.

http://evolution.berkeley.edu/

http://www.techapps.net/interactives/pepperMoths.swf

http://animal.discovery.com/wild-animals/darwin-survive-game.htm

First go to http://evolution.berkeley.edu

This website is a treasure trove of information about evolution. I encourage you to explore this website on your own time.

A. Click on "Evolution 101," Click on "An Introduction to Evolution"

1. Simply put, biological evolution is _____.

2. What is the central idea of evolution?

_____

_____

B. Click on "Mechanisms," which is on the side of the page
Click "Next" on the top right corner

1.Evolution only occurs when there is a change in _____ within a _____ over time.

2. Which of the two scenarios is an example of evolution and why?

C. Click "Next."

What are the four processes for evolutionary change?

1. 3.

2. 4.

D. Click "Next"

Genetic Variation is key to evolutionary change. What are the three sources of genetic variation?

1.
2.
3.

E. Click "Next"

1. A mutation is a _____.
2. What is the function of DNA?_____

_____

3. What can be the result(s) of a DNA mutation? _____

_____

F. Click "Next"

What effect can a mutation have on populations? Give an example of each one.

G. Click "Next"

Explain what can cause a mutation and then click "**Next**." (write out the paragraph)

Gene flow, also called _____, is any movement of _____ from one _____ to another. Gene flow includes lots of different kinds of events, such as _____ being blown to a new destination or people moving to new cities or countries. If _____ are carried to a population where those genes previously did not _____, _____ can be a very important source of genetic _____. In the graphic on the website, the gene for _____ coloration moves from one population to another.

H. Click "Next"

How does sex produce variation and diversity in a population?

I. Click "Next" until you get to "Genetic Drift"

In any population, some individuals will have more kids than other individuals (just by chance). Some of those individuals will be "lucky" and survive. Explain the cartoon and how it shows this idea.

J. Click "Next"

Natural Selection is the most important mechanism behind evolution. This webpage gives you an example of natural selection involving beetles. Read the descriptions and look at the cartoons. Explain what has happened to this population of beetles starting from the initial population.

K. Click "Next"

Give two examples of modern day natural selection.

1. _____
2. _____

L. Click "Next"

Fitness is an often misunderstood term. It does not necessarily mean that the fittest individual is the strongest. What does fitness mean?

Go to this website: http://www.techapps.net/interactives/pepperMoths.swf

Here you will see one of the most famous examples of natural selection: The Peppered Moths.

M. Click on "The Life Cycle of the Peppered Moth"

1. Briefly describe what the Peppered Moth looks like:

2. Who eats peppered moths? _____

What adaptation do moths have that help keep them from getting eaten? _____

_____

3. What do moths do to prevent death in the colder months? _____

_____

4. What colors can the peppered moth come in? _____

N. Click on "Impact of Pollution"

1. What happened to the peppered moth population by 1900? _____
2. Why did people think the moths were all of a sudden becoming much darker? _____
3. _____

4. Why do **you** think there were more dark moths than before?

_____

_____

5. Who first proposed "Natural Selection"? _____
6. What is natural selection? _____

_____

_____

7. How are the peppered moths turning from light colored to dark colored and example of natural selection? _____

_____

8. Why has the number of dark moths decreased in the last 50 years? _____

_____

Click on "Bird's Eye View" and read the instructions for the Peppered Moth Game

O. Do the light forest first and then you can go back and do the dark forest.

9. The number of dark and light moths was equal when the simulation started. How did the number of dark and light moths compare at the end of the simulation? Why?

_____

_____

_____

Go back and do the dark forest simulation.

10. What happened to the number of light and dark moths in this simulation? Why?

_____

_____

P. Go to this website: http://evolution.berkeley.edu/evolibrary/article/0_0_0/lines_01

Here you will collect information on the evidence for evolution using this website. You should also use your textbook (Pages 382-386) to help. Copy the table – using a ruler!

Evidence that life has existed for billions of years and has changed over time.

Piece of Evidence	Explanation of that piece of evidence (you may make a bulleted list and pictures are encouraged)
Fossil Evidence	

Piece of Evidence	Explanation of that piece of evidence (you may make a bulleted list and pictures are encouraged)
Transitional Forms	
Homologies (Homologous Structures)	
Geography (Geographic distribution of organisms)	
Similarities in Embryology	

Q. Go to this website: http://animal.discovery.com/wild-animals/darwin-survive-game.htm
On the bottom of the main image, click on "More about Darwin."

9. What was the name of the ship that Darwin traveled on? _____
10. Where in the world did Darwin make his most important discoveries? _____
11. What was the name of Darwin's most famous book? _____

R. Click on "Natural Selection" on the top of the main image. Copy the sentences and fill in the blanks.

Part 1: Every _____ exhibits _____.

Not all members within a _____ are exactly the _____.

What variations can individuals exhibit? _____

Part 2: Many _____ are passed from parents to their _____.

Part 3: Life in the wild is _____, and organisms with the most beneficial _____ will prosper (succeed and reproduce). This is known as "_____."

If an organism has traits that help it survive or attract mates, what will it be able to do?

_____

Eventually, _____ traits can spread throughout a species.

S. Survival Game: Who wants to live a million years?

You will now play this survival game to model evolution. This game is not easy so I would be sure to look at the hints. Also, when the game starts be sure to pay attention to the environment, the years that have gone by, and what hints Darwin gives you. Finally, there is one part of the game called the "Life Preserver." This is not accurate as far as evolution is concerned, but will help you win the game. Note: There appears to be a slight glitch in the game making it difficult to win but not impossible.

1. Notice that there is initially a lot of variation in the population. What are some variations that you see?

_____

_____

Choose your population.

1. The animals with _____ most suited to the new _____ will _____.
2. After the first cycle (≈ 140,000 years), what has happened to the population of animals?

   _____

   _____
3. After the second cycle (≈400000 years), what has happened to the population of animals?

   _____

   _____
4. If your animals died (which they probably did ☹), why did they die?

   _____
5. Play the game again. How long could you keep your animals alive? _____
6. Why did some animals die, while others thrived? _____

   _____
7. Why did the physical characteristics (phenotypes) of the overall population change? _____
8. _____

Now take the Natural Selection Quiz! What was your score? _____