Tic-Tac-Toe Board for Student Choices – Evolution

Georgia Performance Standard: S7L5 a, b, c

- The Peppered Moth Simulation and Analysis will be completed in class.
- All students will ***complete two other tasks that connect with the middle*** of the board to score "tic-tac-toe" and have completed one task each for element: S7L5a, S7L5b, and S7L5c.

All tasks are due April 15th, 2016. Students will begin presenting that Friday.

1. Beak Shape and Eating Habits (S7L5 a and b) *What is the relationship between the beak shape/size of a finch and its eating habits? In this task you will* a) Create a poster (8 ½ x 11) illustrating the relationship between the beak shape of three finches and their eating habits. b) Include a caption to describe the beak shape and to explain what each finch eats. ***c)*** In a paragraph, explain how beak size relates to process of natural selection to demonstrate what you know and understand. *d)* For an example, see figure 3 on page 156 and/or this site: http://news.harvard.edu/gazette/2006/08.24/31-finches.html	**2. Voyage of the Beagle (S7L5b)** *Imagine you sailed on the HMS Beagle with Charles Darwin. In this task you will* a) Draw and label a map that outlines the journey of the ship and the route the ship. b) Include at least two captions of important dates, pictures, and descriptions of the important along the journey on the map. c) For an example, see figure 2, page 155 or any other resource.	**3. Searching for Fossils (S7L5c)** Become a geologist and paleontologist for a day! Go on a search and find mission for fossils! In this task you will a) Find/make a fossil. b) Take a picture or bring in the fossil. c) Create a poster (8 ½ x 11) of the fossils. ✓ Include a picture/drawing of the fossil ✓ Identify the fossil, record the name. ✓ Determine the age of the fossil. ✓ What type of fossil is it – how do you know? ✓ What does the fossil tell you about the organism and its ancestors? d) For examples, use pages 163-166 in your textbook and (if making a fossil) follow directions to make a cast at http://onramp.nsdl.org/eserv/onramp:330/apr08_moldcast.pdf
4. Age of Fossils (S7L5c) *How do Paleontologists determine the age of fossils? In this task you will* a) Compare and contrast relative dating and radiometric dating with a Venn diagram. b) Create an illustration or a model of sedimentary layers to explain how relative dating is used to estimate the age of fossils. a. Label the oldest and newest layers b. Write an explanation of how you determined the age of the layers c) For an example, see Figure 10 on page 165.	**5. Peppered Moth Simulation and Analysis (S7L5a)** ***REQUIRED and will be completed at school!*** a) In this task students will complete a simulation activity to collect data about peppered moths fighting for survival in two different types of environments. b) Students will respond to the analysis of data questions to demonstrate what they have learned about variations in organisms. c) The simulation can be found here: http://peppermoths.weebly.com	**6. Principles of Natural Selection (S7L5 b)** *You are the head of an advertising company. In this task you will* a) Create a comic strip about Darwin's five principles of natural selection. b) Each principle must be numbered, stated, illustrated, and fully explained from what you have illustrated. In other words, just stating the principle is not enough! c) Your final comic strip should not exceed 8 ½ x 11 paper. *d)* For example, see Table 1 on page 157.
7. Variation and Adaptation (S7L5b) *Variations in organisms are important. Some variations are more helpful than others. In this task you will* a) Make up your own organism that shows changes over time (evolution). b) Create a model or draw a series of pictures about your organism. c) Your organism should evolve at least three times. a. Describe the variation from generation to generation b. State how this change becomes an adaptation and allows the organism's species to survive. c. Label time passed in each change.	**8. Homologous Structures (S7L5c)** *What do homologous structures tell us about the common ancestors of two or more species? In this task you will* a) Create a poster (8 ½ x 11) b) Choose at least three organisms that have a homologous structure. c) Draw and label the homologous structures. (Provide a key to show the parts that are the same.) d) In one paragraph, explain homologous structures and how the structures show that the three different species of organisms shared common ancestors. e) For example, see Figure 13 on page 168.	**9. Evolution (S7L5a, b, and c)** a) Create a PowerPoint presentation of at least 8 educational slides. b) Your presentation must have information for each element: a. Change over time (camouflage, mimicry, moths, finches, famous names in evolution, etc.) b. Natural selection (5 principles, variations, adaptation, etc.) c. Fossils (Different types, relative and radiometric dating, homologous and vestigial structures, etc.) c) Print out 6 slides per sheet to turn in.

_____ Parent's Signature **All tasks are due April 15th, 2016.**

_____ Student's Signature **Students will begin presenting that Friday.**

Rubric for the Evolution Tic-Tac-Toe Assignments					Notes:
	4	3	2	1	
Comic Strip	5 out of 5 principles illustrated and represented accurately.	4 out of 5 principles illustrated and represented accurately.	3 out of 5 principles illustrated and represented accurately.	2 out of 5 principles illustrated and represented accurately.	
Sedimentary Layers	Drawing and explanation of why the layers and fossils are different.	Drawing of a cross section of sedimentary layers that include fossils.	Drawing of a cross section of sedimentary layers that doesn't include fossils or fossils with no layers.	Cross section of sedimentary layers/fossils is confusing or inaccurate.	
Beak Shapes	Explanation of why the beak is shaped the way it is based on what it eats, plus illustrations (at least 3).	Illustration of a comparison on finch's beak shape and what it eats (at least 3).	Illustration of a comparison on finch's beak shape and what it eats (only 2).	Missing one or more parts of the illustration of a comparison on finch's beak shape and what it eats.	
Evolutionary Organism	Explanation and illustration of an organism showing changes over time that improves the species.	Illustration of an organism showing changes over time that improves the species.	Illustration of an organism showing changes over time that just changes the species (doesn't improve it).	Illustration showing something else besides changes over time.	
Moth Simulation	5 out of 5 analysis questions answered accurately.	4 out of 5 analysis questions answered accurately.	3 out of 5 analysis questions answered accurately.	2 out of 5 analysis questions answered accurately.	
Fossil	An explanation of the type of fossil , plus the fossil.	A successful mold or cast of the fossil.	A not-so-successful mold or cast of the fossil.	No mold or cast of fossil but orally responds to what went wrong.	
PowerPoint	6 out of 6 slides accurately completed plus cited references (1 title slide, the others filled with evolution information).	5 out of 6 slides accurately completed (1 title slide, the others filled with evolution information).	4 out of 6 slides accurately completed (1 title slide, the others filled with evolution information).	3 out of 6 slides accurately completed (1 title slide, the others filled with evolution information).	
Beagle Voyage	A handdrawn, labeled map with Darwin's route and more than 2 captions.	A handdrawn, labeled map with Darwin's route and 2 captions.	A handdrawn, labeled map with Darwin's route and 1 caption.	A handdrawn, labeled map with Darwin's route and no captions.	
Homologous Structures	Explanation and illustration of the comparison of homologous structures (at least 3 different organisms).	Illustration of the comparison of homologous structures (at least 3 different organisms).	Illustration of the comparison of homologous structures (at least 2 different organisms).	Inaccurate illustration of homologous structures.	

Turn rubric in with project! Please