

Topic 6: Evolution – 6b. Natural Selection Stories

Resources: Miller, K., Levine J. (2004). *Biology*. Boston, MA: Pearson Prentice Hall.

Building on: The foundation of evolution is the *theory of natural selection* proposed by *Charles Darwin*. That theory contains four very important points:

1. Within a population there is *variation*. Variation is greater in a large, expanding population. Variation within a population gives health to the *population*.
2. Populations and their variations will continue to grow until they reach a *limit* (food, water, nesting sites, new predator, or new disease). At this point, a *struggle* for survival will begin.
3. In the struggle, some variations will be *advantageous* and the *individuals* possessing those variations will live. Other variations will be *disadvantaged* and those individuals will perish.
4. The individuals with the advantaged variations will *mate* with other individuals with advantageous variations, and those variations will be *passed on to the next generation*.

It is important for students to know that these variations must be *genetically based*, and the variations did not appear because of the struggle to survive. The variations were *due to random mutations*, but *nature decides* which variations will be advantageous.

The classic example used to explain natural selection would be the *peppered moths*. You could also tell a fictitious tale about giraffes and their long necks.

Invariably, *Lamarck* and his theory of *acquired characteristics* and *use and disuse* sneak into a discussion of natural selection. It is amazing how ingrained this idea is in many students. When going over Lamarck, it is beneficial to mention that if acquired characteristics could really be passed on to offspring, then babies would be born with their parents' tattoos (a frightening thought).

Links to Chemistry
and Physics:

Chemical evolution (stability of molecules)
Radioactivity
Story telling as a means of assessment

Instructions and Comments on This Activity:

This is the best assessment tool I have found to measure a student's understanding of natural selection. I will think that all of the students "have it," they understand, and when I get back

the stories, I experience some surprises. Fortunately, this gives me the opportunity to identify the students that are still confused by Darwin's theory and help to clarify the concept.

An example would be the student that came up to me after I gave out the assignment and said that he was going to write a story to explain why baboons have pink butts. I told him I thought that was a great idea, but curiosity got me and I asked him to tell me how his story was going to explain those pink behinds. He smiled and said, "One day this baboon sat in a bucket of pink paint. . . ." Oh my! How Lamarckian! We had to talk it over, and he finally got it straight.

The stories don't need to be even remotely factual. This gives students the opportunity to show their creativity, and while they may complain at first, they really seem to enjoy it. One of my favorite stories had to do with why llamas are woolly. According to the story, long ago there were all sorts of llamas: naked llamas, mop top llamas, mullet llamas, mutton chop llamas, and some llamas with woolly coats all over their bodies. All of the llamas were happy until the climate changed and the ice age began. All of the other llamas died from hypothermia, except for the woolly llamas. The woolly llamas mated and had mostly baby woolly llamas. If a mutton chop, mop top, etc. was born, it quickly died due to the cold. That is why all llamas today are woolly.

As you can see, the book doesn't have to have a lot of script. The illustrations can be drawn, they can be stick figures, and they can be printed from the Internet. The students are not being graded for their artistic talent.

I take two pieces of white computer paper and stack them, turn them to the landscape orientation, and then fold them down the middle. This makes a booklet with six interior pages. They do have to have a cover, but that doesn't count as one of the six pages. If students would like to use their own paper or other materials to make the book, that is great. I give them one class period to work on this, and the assignment is due in about two days.

On the due date, after the students turn in their books, I ask if volunteers would let me read their book to the class. At first one or two will agree and then more and more. They laugh and think this is such a crazy assignment. I will ask to keep a couple of books. If you can show an example when you make the original assignment, it helps.

Natural Selection Story Requirements

Due _____

Select a species of animal with an unusual or distinctive feature. Using the fundamental principles of Darwin's theory of natural selection, make up a story explaining how that distinctive feature might have become so prominent in your species of animal. Your story can be a fantasy; it does NOT need to be factual. Be sure that you:

1. Identify a real animal (no extinct species or imaginary animals) with a real feature.
2. Write a storybook that should be at least six pages in length, with illustrations.
3. Your story must satisfy all of the basic principles of Darwin's theory of natural selection.

Value: 10 points on class/lab grade