**Origins 101-3**

**Natural Selection**

Script

Instructions: Advance the PowerPoint slides at every new paragraph and anywhere you see “/”

[1] Origins 101—Natural Selection

[2] In our last presentation, we defined microevolution as change in gene frequency in a population over time.

[3] The example of how this happened within the finch population on the Galapagos Islands illustrates the idea that Charles Darwin is most famous for—/ natural selection.

[4] Darwin first thought of this idea because of what he knew about artificial selection.

[5] Darwin knew nothing about genes. / But he did know that dog breeders could influence the kinds of traits dogs had by carefully choosing to breed only the dogs with certain traits.

[6] He did the same thing with his hobby—which was breeding pigeons.

[7] This process of purposely influencing which traits are passed on to the next generation is called artificial selection.

[8] Darwin thought a similar process might be going on in nature, / but without anyone or anything guiding the process. This idea—which Darwin called natural selection--can be explained using what are often called Darwin’s four postulates:

[9] Number 1: More offspring are born than can survive on the available resources, / which leads to competition. Organisms must compete with each other for those resources.

[10] Number 2: Variation exists in the population and will influence which organisms survive to pass on their genes and which don’t.

[11] Number 3: Adaptations are the beneficial traits that give an organism an advantage in the struggle for survival.

[12] During drought conditions in the Galapagos Islands, having a large beak was more advantageous for a finch / because most of the seeds available at the time were large.

[13] But during especially wet weather, when small seeds were more plentiful, a small beak was the more helpful adaptation.

[14] Number 4: Darwin called this process by which some creatures survive and reproduce and others don’t—natural selection. / And unless they are affected by some chance event, the creatures most likely to survive and reproduce are those with the most favorable traits that can be passed on to their offspring.

[15] Have you ever heard the phrase “survival of the fittest?” This refers to the idea that the organisms with the traits necessary to survive, are more likely to live long enough to have babies and pass their genes on to the next generation. / In this context, fitness is defined as having the most babies.

[16] During the drought conditions, / the large-beaked birds were most fit because they survived to have more offspring. During the wet conditions, / the small-beaked birds were most fit because they survived to have more offspring.

[17] According to Darwin, as natural selection…

[18] acts on the variation present within a population,

[19] those that compete best live to reproduce while others do not,

[20] gene frequency changes, / and microevolution occurs.

[21] Other scientists had suggested evolution before, / but Darwin’s specific contribution to the theory was his suggestion that natural selection was the mechanism that caused evolution. / He borrowed the term “survival of the fittest” from Herbert Spencer because it fit what he was trying to explain.

[22] Darwin thought of the idea in 1838, but he waited to publish it because of the controversy he knew his theory would generate. / In the meantime, a man named Alfred Wallace thought of the same idea and wrote Darwin for advice about an article. / They ended up publishing the idea jointly.

[23] Darwin was right about natural selection happening in nature. / The survival of those with helpful adaptations changes the gene frequency in a population.

[24] When people refer to evolution as a fact, they are referring to this change in gene frequency because of natural selection.

[25] What cannot be demonstrated / is that natural selection is capable of producing the major changes necessary /to change one animal into another kind of animal.

[26] Origins 101 continues next time / with a look at possible sources of variation for natural selection to work on.