**Origins 101-2**

**Evolution Defined**

Script

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

[1] Origins 101—Evolution Defined

[2] A simple definition of evolution is change in living things over time.

[3] More specifically, evolution is a change in the genetic makeup of a specific population of living things. / Even more precisely, it is referred to as the change in gene frequency in a population over time.

[4] Let’s think about what these words mean. What do you remember about genes?

[5] You are probably familiar with DNA and how it contains instructions necessary to make a particular living organism.

[6] Smaller parts of DNA that contain instructions for specific traits are called genes.

[7] Traits like your height…

[8] Hair color…

[9] Eye color…

[10] …and even the shape of your ear lobe, are determined by your genes.

[11] These traits are passed from one generation to the next through genes.

[12] You inherited certain traits from your parents through their genes,

[13] and you will pass on certain traits to your children through your genes.

[14] Now let’s think about the word “frequency.”

[15] Frequency means how often something happens.

[16] Gene frequency refers to how often a certain gene appears in a population.

[17] How does gene frequency change? / Although Charles Darwin and the scientists of his time didn’t know anything about genes, Darwin did have some ideas about how changes happened in a population. / He believed that more offspring are born than can survive on the available resources. / Variation exists among the offspring that are born. / Some variations give an organism more of an advantage than others.

[18] For example, animals with slightly longer legs might be able to better outrun predators.

[19] An animal with thicker fur would be more likely to survive the winter. / A brightly colored male bird might be more attractive to the female bird, increasing his chances of being able to reproduce. / A tortoise with a slightly longer neck might be able to reach food better. / A fish with larger fins might be able to swim better.

[20] Individuals whose variations give them an advantage, survive and reproduce. / As they have babies, the advantageous traits are passed on more often. / Over time, those traits become more common in the population.

[21] A famous example of how this process works involves the finches in the Galapagos Islands.

[22] Variation exists in the finch population. Some finches have small beaks, while others have large beaks.

[23] The finches with smaller beaks eat smaller seeds. The finches with larger beaks eat larger seeds.

[24] One year, during drought conditions, / the plants with smaller seeds didn’t do well, / so there were fewer seeds available for the birds to eat. / Most of the available seeds were large.

[25] Because there was not enough food for all the small-beaked birds, / many of them did not survive.

[26] Since most of the available seeds were large, more large-beaked finches survived and had babies.

[27] Because fewer small-beaked finches were having babies, / fewer genes that produce small beaks were passed on to the next generation. / Because most of the birds that were reproducing had large beaks, / more of the genes that produce larger beaks were passed on to the next generation.

[28] In other words, the frequency of genes that determine beak size had changed within the population of finches. / That change in gene frequency could be called evolution—

[29] specifically microevolution.

[30] Another year when there was a regular amount of rain, / the plants with small seeds grew better, which meant the small-beaked finches had plenty to eat. / More of them survived to have babies, which means there were more genes for small beaks in the population again.

[31] Once again there was a change in the gene frequency in the finch population, / which would be an example of microevolution.

[32] During a year with extra heavy rain fall, / the plants with larger seeds didn’t do as well. Without as much food available for birds with large beaks,

[33] more of them died before reproducing. But the small-beaked finches, which still had plenty of food, survived and had babies—which meant there were more genes for small beaks within the finch population.

[34] Once again a change in gene frequency—or microevolution—had occurred in the finch population.

[35] There is a lot of evidence in nature for microevolution. Another example is a flu virus. The reason we need a different flu shot every year is because the virus has changed some since last year.

[36] These small changes in living things are well documented. / When scientists talk about the *fact* of evolution, they are referring to these kinds of changes—in other words, to *micro*evolution.

[37] Although many scientists believe that lots of microevolution over millions of years is the same thing as macroevolution, / many other scientists believe microevolution does *not* add up to macroevolution, / and that some other factor or factors must be involved.

[38] As Origins 101 continues, / we will learn about natural selection and the important part it plays in the theory of evolution.