

Name: _____

Date: _____

Lesson 7: Answer Key 3

Key for Develop a System Model

CCC: Systems and System Models			
Parts (Components) <ul style="list-style-type: none"> The population What are some other key parts (components) that need to be in your system model? 			
<i>Finches:</i> Beaks, variations, rainfall, 3 plants especially tribulus, death, HMGGA2 gene alleles, wing lengths, offspring, Daphne Major, the Grants	<i>Moths:</i> Colors, trees, lichen, pollution, birds, clean air laws, scientists, rural, intermediate and industrial woodlands, caterpillars, pupae	<i>Swallows:</i> Wings, bridges, cliffs, cars, people driving, highways, generations, mud nests, the Browns, insects	<i>Mustard plants:</i> Days to flower, seeds, rain, a greenhouse, scientists, wet soil and dry soil, a calendar, dead plants, flowers, hybrids and purebreds
Interactions <ul style="list-style-type: none"> What are some key interactions going on between those parts (components) that need to be included in your model? 			
<i>Finches:</i> Beaks eating seeds Rain growing plants Plants making seeds Drought killing plants and birds Alleles causing beak length Parents having offspring Offspring having alleles Grants going to Daphne Major	<i>Moths:</i> Colors causing camouflage Pollution killing lichen Pollution making trees darker Birds eating moths they can find Clean air laws reducing pollution Moths having caterpillar offspring Caterpillars making pupae	<i>Swallows:</i> Birds moving from cliffs to bridges Cars killing swallows Cars driving on highways Birds nesting under bridges People driving cars Generations changing Birds eating insects Browns counting birds	<i>Mustard plants:</i> Rain making plants grow No rain making plants die, soil dry Plants making flowers Flowers making seeds Days going by Hybrids grow differently than purebreds Scientists in a greenhouse
Use the model to explain the system <ul style="list-style-type: none"> What will you need to explain using your model? 			
<i>Finches:</i> Why there wasn't enough food for the finches (because fewer plant seeds because less rain) Why longer beaks let them live (they could eat the big seeds) Why the distribution changed (the short-beaked birds died so no offspring, so only longer-beaked offspring)	<i>Moths:</i> Why it's different in polluted vs. unpolluted areas Why it's more polluted in industrial areas How the lichen colors the trees How the different colors of moths can hide on different trees or trees with more or less lichen Why there are a lot of typical when carbonaria is dominant	<i>Swallows:</i> Why birds with shorter wings survived better (because short means more maneuverable which means less getting hit by cars) Why there were more and more shorter-winged birds over time Why cars killed fewer short-winged birds Why the birds moved to the highways in the first place	<i>Mustard plants:</i> Why less rain means a shorter growing season How plants make offspring Why there's less rain for a few years How come some survived and some didn't Why the scientists grew them in a greenhouse How we know that the trait is genetic

Our system model helps us explain how and why the population changed from the beginning to the end of the study. In each case there are effects on the **quantity** of individuals in the population, and the **proportion** of individuals with a particular trait.

CCC: Scale, Proportion, and Quantity

Sketch a model that shows a population of your organisms at the start of your case study. Then show what happens to the population over the next couple of generations. Be sure to represent effects on **quantity** and **proportion**.

