

Extinction & Speciation Learning Segment Table

(approx. 4 days of instruction)

LS	Model Move	Est Time (min)	Overview	What did we figure out?	Model Ideas Generated
1	P → Q	30	We begin by considering what the large animal life was like on Earth just before the last mass extinction and then compare that to the life on Earth right now.	The kinds of living things have changed a lot on Earth over time and the number of species on Earth has decreased at times and increased at others. We briefly explored what it means when species numbers go down and talked through extinction. Then we thought about what happens after big extinction events and realized we need to figure out how new species form.	
2	P	10	We realize we need some clarity about this thing we call species. We show examples of organisms that look alike but are separate species, and some that look very different but are members of the same species. The morphological species concept is thus problematic. We show “non-examples” that may be familiar to students, mules and ligers.	We produced a definition for species. A species is a group of organisms with similar characteristics that can interbreed and produce fertile offspring. We acknowledge that this definition is not perfect for all cases – for example, asexual organisms.	
3	Q → M	20	We now look at the specific example of the evolution of birds from dinosaurs and come up with our first model statement.	We learned that modern birds are descendants of dinosaurs. We came up with our first model idea about how traits can change over time and groups of organisms branch off from each other (basically, “descent with modification”). Moving forward we ask the more specific question of how new species form from existing species.	

4	Q → M	70	We return to the Galapagos and wonder why there are so many kinds of ground finches. We play Wormeaters (the Sequel) and figure out what happens to adaptive advantages when the environment changes for different groups. We then apply these ideas to the finches.	We see that under different conditions different variations may have an advantage. We also have our second model idea which is something like: when natural selection acts on different populations in different ways, they may diverge in their characteristics.	
5	Q → M	40	Here we wonder what conditions lead to new species not just trait divergence. We look at vignettes covering scenarios around reproductive isolation and add a model idea.	We looked at reproductive isolation vignettes and came up with another model idea which was that when a population of a single species is reproductively isolated into two populations, each population will evolve independently until the two populations cannot produce viable offspring anymore.	
6	M → P	55	Revisit dino to bird in the context of our driving question. We see that once divergence occurs over a long enough period; we get a radiation of species. We use our speciation model to explain something about the dino to bird phenomenon.	We answered our driving question and considered how our ideas relate to our Unity and Diversity question.	