

**Biology 155**  
**Instructor: Dr. Davis**  
**Study Guide 6**

**Recommended text problems:** Chap. 24: 1-10

**Key Terms:**

Adaptive radiation	Cladogenesis	Homeotic gene	Post-zygotic isolation
Allopatric speciation	Exaptation	Micro/macro evolution	Pre-zygotic isolation
Allometric growth	Gradualism	Paedomorphosis	Punctuated equilibrium
Anagenesis	Heterochrony	Polyploid	Reproductive isolation
Biological species concept			Sympatric speciation

**Questions:**

1. What are different ways biologists have defined “species”? What are some of the benefits/drawbacks to each of these various definitions? When or when can’t each of these definitions be used? Be able to apply these definitions to argue whether or not two groups of organisms are the same or different species. What is the current method most often used to define a species? Why is it so difficult to define a species?
2. How are new species formed? Be able to distinguish between allopatric and sympatric speciation events. Be able to outline the steps of a speciation event starting with a single population.
3. What roles do each of the following play in the speciation process: geographic isolation, gene flow, reproductive isolation, hybridization, natural selection, genetic drift?
4. Given two separate populations of a single species, would gene flow between these populations increase or decrease the probability that these two populations will become different species?
5. Answer the same question as above for genetic drift. How are genetic drift and the founder effect related?
6. What is the difference between post-zygotic and pre-zygotic isolating mechanisms? Describe examples of each.
7. What’s the difference between macro- and micro-evolution? How can small changes in gene frequencies lead to large evolutionary changes on organisms?
8. What are adaptive radiations? What factors promote adaptive radiations?
9. What is the difference between gradualism and punctuated equilibrium? Does the fact that some evolutionary biologists disagree about the role of these two theories in evolution weaken the theory of evolution?
10. Study the example of speciation among salamanders in California. Has speciation occurred? Is this allopatric or sympatric speciation? What is a “ring species”?