

Life Chapter 22—Mechanisms of Evolution -- Questions and Comments
Conservation Biology
Spring 2009

Note – the vast majority of these questions underscore material that was both in the book and will be covered in class.

1. Distinguish between artificial and natural selection. Be sure to reflect on the fact that selection does not require a conscious hand to guide it.
2. Be sure that you understand that populations evolve – individuals do not – they undergo a process of development but for all intents and purposes their genotypes do not change.
3. What is adaptation – is it part of the phenotype or genotype? If only the former, how is the latter related? Which evolves – the phenotype, genotype or both?
4. We covered Hardy-Weinberg extensively in class; be sure that you are familiar with all aspects of this very important topic.
5. Review the graphs on directional selection (fig 22.12) and be sure you understand them – they are a bit different from the ones we saw in class – especially those on the left that show fitness instead of frequency.
6. Be sure you understand what is different about sexual and natural selection and what is common to both of them. From class, please be sure you understand the difference between producing adaptation in the sense that Darwin argued and producing traits favored by sexual selection. What is the conflict?
7. Be sure you understand what a neutral allele is why it might accumulate in a population. Predict what happens to neutral alleles in small populations. Be sure you understand the roles of mutation, sexual recombination, and evolutionary processes with regards to allele frequencies – which processes change frequencies, which do not of those that change frequencies know which can increase or decrease an allele frequency rapidly. Be sure you understand the role of sexual reproduction (genetic recombination) in evolution.
8. Know what a polymorphism is. Know how environmental variation favors the maintenance of genetic diversity across large temporal and spatial scales (and consider the idea of diversity in different sub-populations).
9. Know that evolution acts under constraints and be familiar with the idea of developmental constraints and trade-offs (these are not the life history trade-offs that we will consider later in the population ecology section of the course).
10. Finally, make note of human influences on evolution – the hunter/trophy example is particularly good.
11. Be able to answer the "Recap" questions in the boxes at the end of sections 22.1-22.5. These are excellent overview questions.