

**Study Questions: Philosophy of Science and Scientific Methodology
and Progress**
Conservation Biology
Spring 2009

1. What are the three domains of life? Which show the most diversity in structural genes and biochemistry? Which shows the most diversity in large scale (non-molecular) structure and in genetic regulation?
2. What is the phenotype? What causes variation in phenotypes within a population? If two individuals have identical genotypes (and what is a genotype) will they have identical phenotypes? Explain.
3. What is the central dogma of molecular biology and what is its significance?
4. Is the sequence of nucleotides in a DNA molecule the genetic information, part of the phenotype, or both? Explain.
5. What is the difference between a micro and macro trait? When we say that a single gene causes a macro trait, what do we really mean? – Give a good explanation for how a single gene can control a complex trait.
6. What is the advantage of being diploid (as compared to haploid)?
7. What is endosymbiosis and what organelles are probably the result of endosymbiosis? How does endosymbiosis work with corals (what is involved) and explain what coral bleaching is. Name a few likely causes of coral bleaching.
8. What are the advantages and disadvantages of sexual reproduction? What is meant (in this context) by "bet-hedging?"
9. What is genetic recombination? Is it the same as mutation? What are the main mechanisms of recombination? Does recombination produce new alleles? – if not, what does?