

## Self-Study Problems #2: Speciation and Mendelian genetics

1. Macroevolution is
2. According to the biological species concept, what allows species to remain different from each other, or evolve further apart?
3. According to the ecological species concept, what is the key process that allows species to remain different from each other?
4. According to the ecological species concept, how does the process you named in question 3 keep species different from each other?
5. A chronospecies (or paleospecies) is
6. Describe the situation required for allopatric speciation to occur.
7. What is meant by punctuated equilibrium?

8. Fill in the blanks. Mendel's "particles" of inheritance are now called \_\_\_\_\_ which often come in two or more variant forms called \_\_\_\_\_.

9. The ability to roll one's tongue is thought to be a simple Mendelian trait, like pea seed color. About 70% of Europeans can roll their tongue; about 30% cannot. Based on this, you can infer that the allele for tongue-rolling is (circle one):

dominant                  recessive                  codominant                  can't tell

10. In humans, free-hanging earlobes (F) are dominant, and attached earlobes (a) are recessive. Mr. Smith is homozygous dominant.

a. Mr. Smith's genotype (with regard to earlobes) is \_\_\_\_\_.

b. Mr. Smith's phenotype (with regard to earlobes) is \_\_\_\_\_.

c. Mrs. Smith is heterozygous. Fill in and fully label the Punnett square below to represent the gametes that Mr. and Mrs. Smith produce, and the genotypes and phenotypes of the offspring they could have.


d. Mrs. Smith gives birth to a son with attached earlobes. What can you conclude?

e. The Smiths' neighbors, Mr. and Mrs. Jones, both have free-hanging earlobes. Can they have a child with attached earlobes? Explain.