

VIDEO GUIDE: "The Making of the Fittest" - HHMI**VIDEO #1: Natural Selection & Adaptation**

- 1) Light colored rock-pocket mice have a survival advantage on which type of land? _____
- 2a) Do the mice prefer to live on one type of land over the other? _____
- 2b) "Who" is doing the selecting? _____
- 3) What would occur that might cause a dark-colored mouse to first appear in a light-colored population? _____
- 4) When can a mutation occur? _____
- 5a) If dark color gives mice a 1% survival advantage, in about 1000 years, what percent of the mouse population will be dark? _____
- 5b) If there was a 10% survival advantage, how long would it take to reach the same % found in 5a? _____
- 6) When rock-pocket mice were analyzed from other parts of the Southwest (lava flows hundreds of miles apart), what did scientists discover about the mutation that made the mice dark? _____
- 7) What is the role of a changing environment in evolution and natural selection? _____

**VIDEO #2: The Birth & Death of Genes**

- 1) What is unusual about the ice fish (Why is it colorless)? _____
- 2) What percent of our blood (by volume) is red blood cells? _____
- 3) How do ice fish get the oxygen necessary for cellular respiration if they don't have hemoglobin? _____
- 4) 34 million years ago, what happened that resulted in the water temperature around Antarctica dropping from 10°C to -1.8°C over a period of time? _____
- 5) What happened to the ancestral gene that led to the formation of the antifreeze gene? _____
- 6) Dr. Carroll uses the phrase "inventing something new from the old." What does this mean? _____
- 7) Which gene in ice fish is "broken" and will eventually be lost since it is no longer used? _____



VIDEO #3: Human Selection & Adaptation

- 1) Describe what happens to a person suffering from sickle cell anemia? _____
- 2) What is the frequency of sickle cell anemia in African Americans? _____
- 3) For a person with sickle cell anemia, red blood cells sickle under what type of environment? _____
- 4) What disease do *Anopheles* mosquitoes cause? _____
- 5) What evidence did Dr. Anthony (Tony) Allison use to show a link between the frequency of sickle cell anemia and malaria? _____
- 6) If a person inherits two sets of genetic instructions for a gene that are identical, they're called _____ for that trait. Two different alleles is referred to as: _____
- 7) Which of these individual's would have a selective & survival advantage if they were born into an area that has a high incidence of malaria:
homozygous dominant, homozygous recessive, heterozygous? _____
- 8) HOW does the mutation on the hemoglobin gene help prevent malaria? _____

