Name: _____ Period: _____ Date: _____

Understanding Evolution
your one-stop source for information on evolution

EVOLUTION 101 | TEACHING MATERIALS | RESOURCE LIBRARY | SUPPORT THIS PROJECT

Misunderstandings About Natural Selection

Part 1: *Use the Berkeley site to help you answer the following questions.*

A. Misunderstandings about natural selection

1) Why do *you think* harmful traits still exist in the collective gene pool of any species? Why haven't all the "bad" genes been weeded out by natural selection?

B. Selection, not perfection

2) What is wrong with thinking about evolution in terms of "need", "try", and "want"?

C. The limitations of natural selection

3) Give two possible reasons cheetahs seem to have maxed out their speed?

D. The "bad" gene

4) What is meant by the term "heterozygote advantage"?

5) What is *neurofibromatosis*, and why does its harmful allele persist in the human gene pool?

6) Why do people still get Huntington's disease if it's harmful to a person?

E. But it's not random either!

7) A population of organisms undergoes random _____ and non-random _____.
The result is _____ evolutionary change.

F. Defining adaptation

8) Why can't we say that all traits are adaptations?

9) Did feathers first evolve for flight? How do we know?

G. Not an adaptation

10) What is meant by "exaptation"? Can you think of an example BESIDES feathers?

PART 1 URL: https://evolution.berkeley.edu/evolibrary/article/0_0_0/misconcep_01

11) The blue-eye allele is now understood to be a recently mutated variant of the normal eye-color gene responsible for producing brown pigment (melanin) in the iris. This allele doesn't seem to have provided any advantage over the other, so why has it spread through the gene pool? Is this a good example of "genetic drift"?

H. The neutral theory

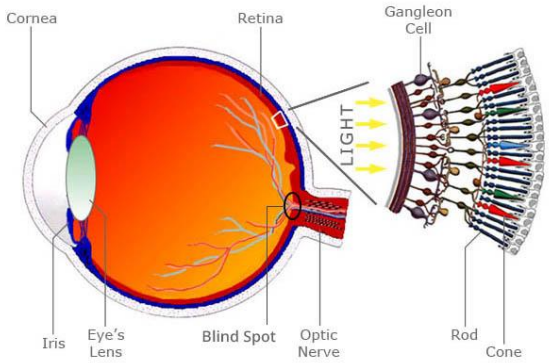
12) The neutral theory of molecular evolution suggests that most of the genetic variation in populations is the result of _____ and _____ and NOT _____.

13) How do you think this relates to so-called "junk DNA"?

I. The straight story

14) Recall that the vertebrate eye is set up in such a way that the nerves (ganglia) that transmit signals from the light sensing cells (rods and cones) to the brain are actually in FRONT of the retina, partially obscuring incoming light.

TRUE/FALSE: This arrangement is an *adaptation*. Explain why or why not:



Part 2: *On the homework page, click the 2nd link, entitled "Why Harmful Recessive Alleles Don't Disappear". Work your way through the entire module, including the quiz (step 4). Then, complete the following:*

15) How does one get Tay-Sachs disease?

16) Why hasn't this recessive allele been completely removed by natural selection?

Part 3: *Go to the Evolution PowerPoint. Read through the slides for the final topic, "Evolution in Action". Then complete the following:*

17) How do some bacteria develop resistance to antibiotics?

18) Sickle-cell anemia is a harmful blood disorder caused by a recessive allele. Why has this trait actually been ***selected for*** (*increase* in allele frequency) in certain parts of Africa?

PART 2 URL: https://www.sciencemusicvideos.com/ap-biology/module-21-population-genetics/why-harmful-recessive-alleles-dont-disappear/