

Make-A-Mutant

DNA & MICROEVOLUTION

OVERVIEW:

DO NOT WRITE ON THIS PAPER... Complete all work on your own notebook paper. In this assignment, you will create an example of microevolution by mutating a DNA strand and explaining how it will impact the organism.

BACKGROUND:

There are many factors that can be examined to understand how populations evolve, or change over time. At the smallest level, we can examine how changes in DNA cause an organism's phenotype (outward appearance) to change. This is called microevolution. On a much larger level, we can examine evolution of an entire population through natural selection over long spans of time. This is what we refer to as macroevolution. Evolution starts with minor changes occurring in generations, so that over time these changes accumulate to change an entire species dramatically.

PROCEDURE:

SETTING UP YOUR ORIGINAL ANIMAL DNA SEQUENCE...

1. Pick an animal (real or imaginary) that you would like to mutate. Write the name of your animal on your paper then describe what your animal looks like in 3-5 sentences.
2. Write out a section of your animal's DNA, at least 30 bases long... you pick the order the bases in this DNA sequence. *Remember, since this is supposed to be DNA, only use A, C, G & T.*
3. Under the DNA sequence, write out the complementary mRNA sequence that would be paired with your animal's DNA. *Remember, since this is supposed to be RNA, only use A, C, G & U.*
4. Use your textbook (p. 187) to determine the names of the amino acids encoded in the mRNA strand you have now written. Write them out underneath your mRNA strand.

MUTATING YOUR ANIMAL'S DNA...

5. Pick one point to mutate in your original DNA sequence.
6. Write "Mutation" on your paper and write a new DNA strand that has been changed from the original at ONE POINT ONLY. Write the new mRNA strand and amino acid sequence that your animal will have as the result of this change.
7. Pick which physical trait you want to be affected by this change and write the name of the trait affected (ex: fur color, claw length, etc.)
8. Repeat this process (Steps #6-8) three more times, each time making a new DNA mutation, writing the new mRNA sequence, amino acids and trait affected.

SHOWING THE CHANGES IN PHENOTYPE...

9. Now you will examine how your animal has changed over time... REMEMBER this would realistically occur over many, many generations and NOT to the same animal.
10. Create a timeline showing the sequence of traits that were affected by the mutations.
11. Draw a series of pictures under your timeline to show your original animal, each mutation, and your final outcome for your animal.
12. Think of some ways that the mutations you chose COULD provide an advantage for survival in your animal's environment. Describe the advantages you thought of for your mutations.
13. Title your page with the name of your animal and the name of the assignment. Turn it in.

Use the back of this page to guide you through your animal mutations and microevolution 

Make-A-Mutant: (Animal Name)

My animal...
Description...

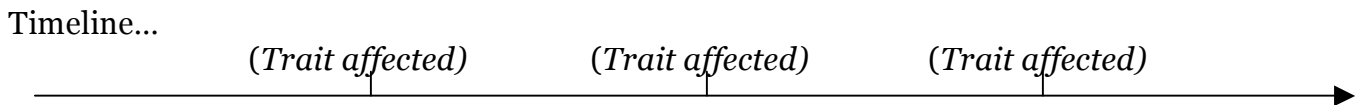
My animal's...
DNA sequence
mRNA sequence
Amino Acid sequence

Mutation #1...
New DNA
New mRNA
New amino acids
Trait affected

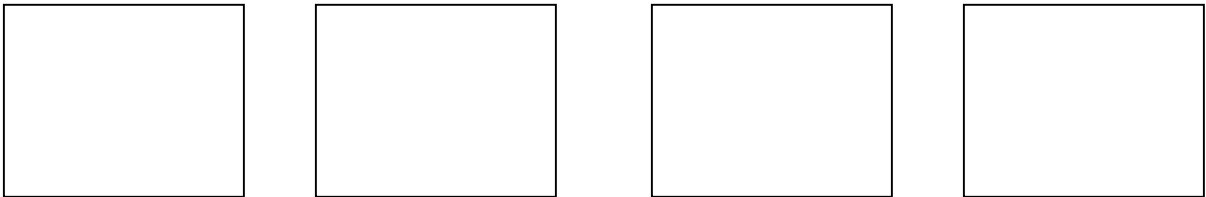
Mutation #2...
New DNA
New mRNA
New amino acids
Trait affected

Mutation #3...
New DNA
New mRNA
New amino acids
Trait affected

Mutation #4...
New DNA
New mRNA
New amino acids
Trait affected



Drawings...



Possible advantages of these mutations...