Genetic Change Notesheet C. Kohn, Waterford WI

Name: Hour Date:

Date Assignment is due: Why late? Score: + ✓ -
 Day of Week Date If your project was late, describe why**Directions**: Use the accompanying PowerPoint (*available online*) to complete this sheet. This sheet will be due upon the completion of the PowerPoint in class. These assignments are graded on a +/✓/- scale.

1. The traits of all species are determined by
2. All proteins are made from , and different

of amino acids result in .
3. What determines the order and arrangement of the amino acids in a protein?
4. What will happen if this gene in the DNA of an organism has a mutation?
5. What determines whether a change that occurs because of a mutation will be beneficial or harmful?
6. Complete the missing components of the image below:

7. Whether or not an individual can thrive in its environment depends on
8. What is genetic change?
9. How does genetic change relate to mutations?
10. In order for a mutation to result in genetic change, what two conditions are necessary?
11. What is a mutation?
12. Why would a mutation usually be harmful?
13. T or F: A mutation is always harmful. Explain:
14. Briefly summarize how and why 87% of Tibetan people have the EPAS1 mutation:
15. If a beneficial mutation can be , it may

result in an that makes it more likely for

those individuals to .
16. What is natural selection?
17. How did natural selection enable green tree frogs to be more prevalent in wetlands and gray tree frogs to be more prevalent in wooded areas?
18. What is evolution?
19. T or F: a species could change overnight due to evolution. Explain:
20. How is evolution different from natural selection?
21. Briefly summarize the four components necessary for a species to undergo evolution:

Genetic Variation:

Inheritance:

Competition:

Differences in Reproductive Rates & Survival Rates:

1. How is the green anole an example of rapid evolution?
2. Why do some species (like the horseshoe crab) seem like they haven’t evolved or changed at all over millions of years? In your explanation, address how and why species change through natural selection.
3. T or F: If there is evolutionary pressure to change, a species will always evolve and adapt.
4. Why did the mammoths go extinct? Why didn’t they just evolve to adapt to the warming climate?
5. Extinction is
6. Usually a species goes extinct if
7. T or F: every species will eventually go extinct. What percent of species have already gone extinct? %
8. Current rates of extinction are normal rates of extinction.
	1. About the same as b. Slower than c. Far more rapid than
9. How many species go extinct per hour on average? Why?
10. What are the four main causes of the current rate of extinction?
11. Why should anyone care about this rate of extinction?
12. What is genetic drift?
13. T or F: in genetic drift, a variation of a gene/trait will become more prevalent if that trait is beneficial.

Explain:
14. What is migration?
15. How does migration increase genetic variability?
16. How could migration reduce the risk of the extinction of a species?
17. What is artificial selection?
18. How is artificial selection different from natural selection?
19. T or F: in both artificial selection and natural selection, a species ability to survive in its environment increases.

Explain:
20. Through agriculture, humans have completely changed species of plants, animals, and fungi by
21. T or F: humans have understood how genetic change through artificial selection has worked since they began domesticating species 10,000 years ago.
22. If early humans did not understand how species changed through domestication, how is it that they were able to change wild species into the domesticated plants and animals that we know and recognize today?
23. What is domestication?
24. While it was well-understood

 , what was not

understood was
25. Scientists did not know if the changes that occurred during domestication were entirely

 , or if other factors (such as ) were

responsible for .
26. What are five common differences between domesticated animals and wild animals?
27. Summarize how the Farm-Fox experiment worked:
28. What did the Farm-Fox experiment demonstrate?
29. How did these researchers prove that the traits of the tame foxes were genetically based?
30. When researchers analyzed the genomes of the tame foxes, what did they discover?
31. When the foxes were selected for , they were also unintentionally

selected for
32. This suggests that when the domestication of different species first occurred, many of the traits that we

associate with domesticated species were
33. What is genetic linkage?
34. The closer that are to each other, the they are to be

transferred with each other. The apart are on a

the they are to be together.
35. In the space to the right, draw both linked and unlinked genes 🡺 Linked: Unlinked:
36. T or F: Genes that are close on the same chromosome are called ‘linked’ genes.
37. Meiosis is the process in which

each with
38. In the process of meiosis, ordinary bodily cells are changed from having

 to having .
39. What is crossing over?
40. What is independent assortment?
41. How does crossing over & ind. assortment affect genetic linkage?
42. Why do domesticated animals typically have other common traits such as floppy ears, shorter noses, etc.?
43. T or F: prior to 1900, almost all artificial selection and domestication was through trial and error.
44. All cattle descended from a genetic ancestor called the . T or F – this was a small, calm animal.
45. With little outside interference, the cattle in one area would be

that were to the people who .
46. What two factors resulted in the formation of the breeds of cattle?
47. What is a breed?
48. Summarize the traits and qualities that would help you to recognize each of the following breeds:

Holstein:

Jersey:
Brown Swiss:

Ayrshire:

Guernsey:

Milking Shorthorn:
49. What was the purpose and role of breed associations in the formation and improvement of the dairy breeds?
50. What are two benefits and two drawbacks of having highly-selected breeds of cattle?

Benefit

Benefit

Drawback

Drawback

**===============================*Unit Wrap-up*===============================**

1. What is a topic or concept from this unit that you found to be more challenging? Write or describe below:

In the space below, create a mnemonic, rhyme, analogy, etc. to help you remember this particular concept:
2. What is a 2nd topic or concept from this unit that you found to be more challenging? Write or describe below:

In the space below, create a mnemonic, rhyme, analogy, etc. to help you remember this particular concept:
3. What is a 3rd topic or concept from this unit that you found to be more challenging? Write or describe below:

In the space below, create a mnemonic, rhyme, analogy, etc. to help you remember this particular concept: