

The four factors



Track 11

1. The four factors that influence natural selection are genetic variation, overproduction of offspring, struggle for existence, differential survival and reproduction. Natural selection says that the organism most fit for living in its environment, will be most likely to survive and reproduce passing on those good traits to their offspring. Eventually, there will only be organisms that have those good traits.
2. People with one sickle cell gene will survive the disease and grow up to reproduce children with the gene. Just one person had the original mutation and that has caused most of Africa to now have that gene because that gene makes them more fit to survive in their environment.
3. 3. 1. Data Table
 2. Explain how the color of moths increases or decreases their chances of survival depending on the environment.

In a sooty forest, the darker moths blended in more and were harder to spot by predators which gave them a higher chance of survival. In the lichen forest, the lighter moths blended in more giving them a higher chance of survival.
4. 500 light colored moths and 500 dark colored moths are released into a polluted forest. After 2 days the moths were recaptured, make a prediction about the number of each type of moth that would be captured.
5. About 7% of the dark moths will be captured and about 93% of the light moths will be captured.

6. How has the striking change in coloration come about? (Include an explanation of how the dark moth appeared and how the proportion of dark moths changed from 0.0005% to more than 90% in polluted forests.)
7. The dark coloration was an accidental genetic mutation but in that environment, it was more fit to survive so over time, there were much more dark colored moths.
8. What underlying law of nature has produced this change? (Use Darwin's theory of evolution and apply it to what you have learned in this investigation.)
9. Natural selection produced this change.
10. Fitness is not necessarily the fastest or the strongest, it is the best suited for the particular environment. In that sense, survival of the fittest is an accurate statement. The brown beetle may not be faster or stronger than the green beetle but it produces more offspring and in this case, that makes it more fit.
11. If the green beetles tasted bad to predators then eventually, there would be no brown beetles left because the green beetles would have an advantage. They would be more fit for their environment which would give individual green beetles a better chance of surviving and reproducing than individual brown beetles.
12. When a group of bacteria is attacked by an antibiotic, there may be an individual bacteria that has a genetic mutation allowing it to survive the attack. Since that individual survives, it can divide and all

of its “ offspring” will have that same genetic mutation. Eventually all of the bacteria will be immune to the antibiotic.

13. Microevolution happens on a small scale with individual populations. Macroevolution happens on a large scale creating many different species from one original.
14. Organisms that reproduce through asexual means create offspring that have exact copies of their own DNA. Their offspring are perfect clones of the mothers.
15. Sexual reproduction is time consuming, and mothers only get to contribute half of their genes. This makes asexual reproduction look better but in reality it isn't. Asexually reproducing species stopped evolving when they became asexual because there is no genetic mutation or variation (offspring are clones of parents). This leaves them susceptible to things like diseases. Since they can't evolve, their species can't become immune to diseases, which causes their species' to become extinct.