

The Evolution of Canis pedatus

Summary

Students will evaluate an isolated population and infer the effects of natural selection and reproductive isolation. They will identify environmental forces that drive evolution and will also investigate the definition of a species.

Main Core Tie

Science - Biology

[Standard 5 Objective 1](#)

Time Frame

3 class periods of 60 minutes each

Group Size

Small Groups

Materials

- [student worksheet](#)
(attached)
colored pencils
unlined paper

Background for Teachers

Time needed:

Two 50 minute class periods with optional 3rd class period for presentation of results

Instructional Procedures

- Make a copy of student sheet
- Divide students into groups of 4
- Assign each group an island
- Read through activity with students and answer any questions
- Allow students 2 full class periods to work on this assignment
- You may want to have students present their work to the class in a 3rd class period

Answers to Questions:

- Answers will vary.
- Answers will vary.
- Answers will vary.
- Answers will vary.

Because the animals were placed in very different environments and allowed to roam free for an extended period of time this most likely would lead to the formation of four different species. If the species from each island were introduced to each other again they probably would not interbreed. There may be physical, social or even genetic barriers that prevent them from producing fertile offspring.

The larger the dog population the more genetic variability is present. The larger the gene pool the more likely the species is to survive in its new habitat. This is because there is a larger number of alleles in the population and more chance of some being beneficial. If the population

was small it wouldn't be likely to survive the environmental pressures of the new environment. Selective breeding is a controlled change in a population. A person selects for a desired trait and then breeds those organisms which possess that trait so that the presence of the trait increases in future generations. This happens independent of the environment. Natural selection is driven by pressures in the environment which make some individuals better fit and more likely to survive and pass on their genes to future generations, thus increasing the frequency of the beneficial trait in the species.

Mutation provides the raw material for evolution. Without mutation evolution could not occur. Usually mutations are harmful but some are beneficial and can make an organism better adapted for its environment. Recombination allows for increased diversity in the gene pool as opposed to asexual reproduction. This again allows for more chances that organisms may be better fit for their environment.

If the population were an asexually reproducing population then it would reproduce much faster. However if the bacteria was not well suited for the environment it may die out very quickly because there is not a great deal of diversity in the gene pool. Without this diversity it makes adaptation difficult.

Answers will vary.

Assessment Plan

Scoring Guide:

Questions are valued at 5 points each for a total of 50 points. You may also want to include a group participation grade of 15 points.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

[Utah LessonPlans](#)