

## CHAPTER 13 - How Populations Evolve

### Chapter Reading Guide

1. Describe five adaptations that help blue-footed boobies survive.
2. Explain how Darwin's voyage on the Beagle influenced his thinking.
3. Describe the ideas and events that resulted in Darwin's 1859 book.
4. Explain how fossils form, noting examples of each process. How is the fossil record some of the strongest evidence of evolution or the change in organisms over time?
5. Explain how the following divisions of science document evolution:  
**Biogeography -**  
**Comparative anatomy -**  
**Comparative embryology -**  
**Molecular biology -**
6. Describe Darwin's assumptions in developing the concept of natural selection.

7. Explain how artificial selection supports natural selection.



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8. Describe two examples of natural selection known to occur in nature. Note three key points about how natural selection works.

9. Explain the significance of the Hardy-Weinberg equilibrium to natural populations and in public health science. Describe the five conditions required for the Hardy-Weinberg equilibrium.

10. Explain how the following processes influences microevolution:

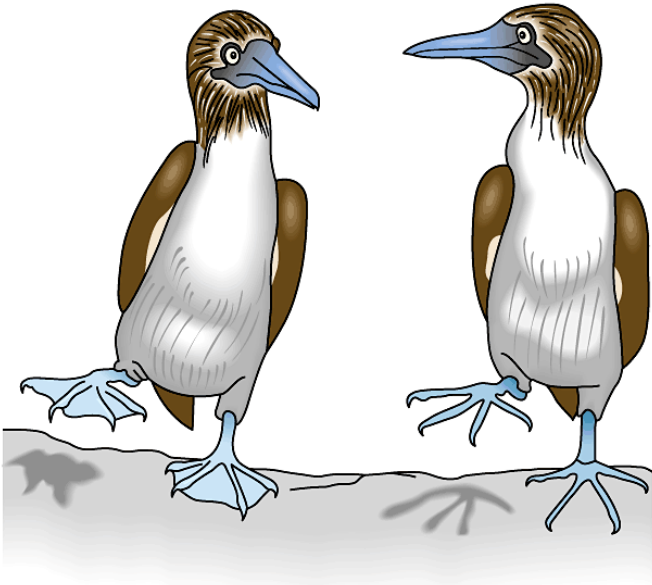
**Bottleneck effect -**

**Founder effect -**

**Gene flow -**

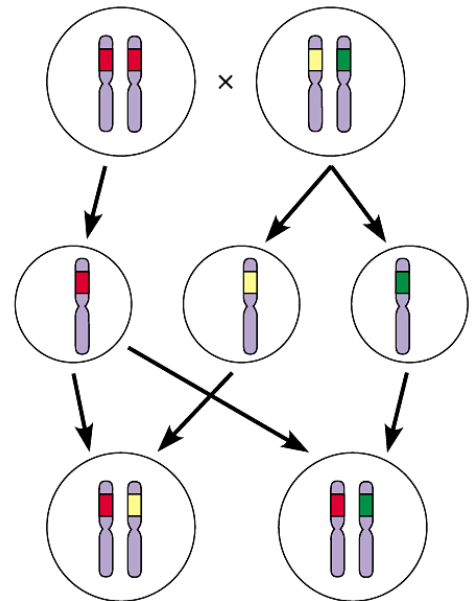
**Mutation -**

11. Explain why only some variation is heritable. Explain how genetic variation is measured.



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12. Label the drawing below. Then explain in 25 words or less how mutation and sexual recombination produce genetic variation. **Remember to number your words.**



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13. Explain why multiple drug "cocktails" are more likely to be effective against HIV than single drug treatments.

14. Define **Darwinian fitness**. Explain why "survival of the fittest" can be misleading.

15. Explain why antibiotic resistance has evolved.