Year 12 Science: Gene pools and how they change

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. A population of 50 snails has 18 AA, 24 Aa and 8 aa. Find the frequency of A and of a.

2. The frequency of allele B in a population is 0.35. What is the frequency of its only other allele, b?

3. A storm kills most of a small island population of skinks, and which ones die is down to luck. Which process has changed the gene pool?

4. Six birds are blown to a new island and start a population there. What is this called?

5. In 1989, 18 of 35 black robin females laid rim eggs. What percentage is that, to one decimal place?

6. Which process adds alleles to a gene pool from another population of the same species?

Exam-style question: the black robin

In 1980 only five black robins survived, with one breeding pair. Some females lay eggs on the rim of the nest, a trait that fits a single dominant allele (R). Rim eggs never hatch unless people move them into the nest. Staff did this until 1990: in 1989, 51.4% of females were rim layers, and in 2007 to 2011, after it stopped, 9% were.

7. Describe what is meant by a gene pool and allele frequency.

8. Explain why the 1980 bottleneck reduced the genetic diversity of the black robin.

9. Suppose a sample of 40 robins contained 2 RR, 12 Rr and 26 rr birds (practice numbers, not real counts). Calculate the frequency of R and of r.

10. Discuss how human management and natural selection changed the frequency of the rim-laying allele between 1980 and 2011.

Fix the mistake

11. Correct this statement: "Individuals evolve when they adapt to their environment."

12. Correct this statement: "After a bottleneck, once the population grows back, its genetic diversity comes back too."

13. Correct this statement: "Genetic drift means the best adapted alleles become more common."

14. Correct this statement: "With 98 BB, 84 Bb and 18 bb, the frequency of b is 18 ÷ 200."