Name _____ Block _____ Date_____

Microevolution Gizmo

1. Define **allele frequency**. _____
2. How would you determine the frequency of an allele in a population's gene pool?

Set up the initial conditions of the Microevolution Gizmo as follows: 50% DD, 50% dd; Fitness of DD: 90%, Fitness of Dd: 75%, and Fitness of dd: 60%

3. Based on the population chart shown, describe the initial population (Gen 0).

   • DD _____   Dd _____   dd _____

4. Click b*egin,* then *predator.* What kind of bird (genotype) was killed most? Explain why.

5. Click *breed,* then *hatch.* Describe the current (Gen 1) population.

   • DD _____   Dd _____   dd _____

Click continue, predator, breed, and hatch until you get to Gen 6.

6. Click *Allele Graph* and draw the plot of allele percentages over time. Then click *Genotype Graph* and draw the plot of genotype percentages over time.
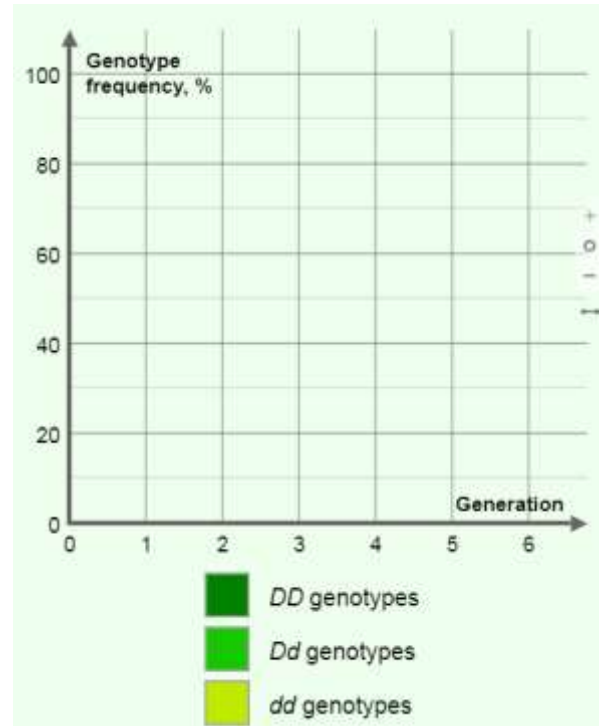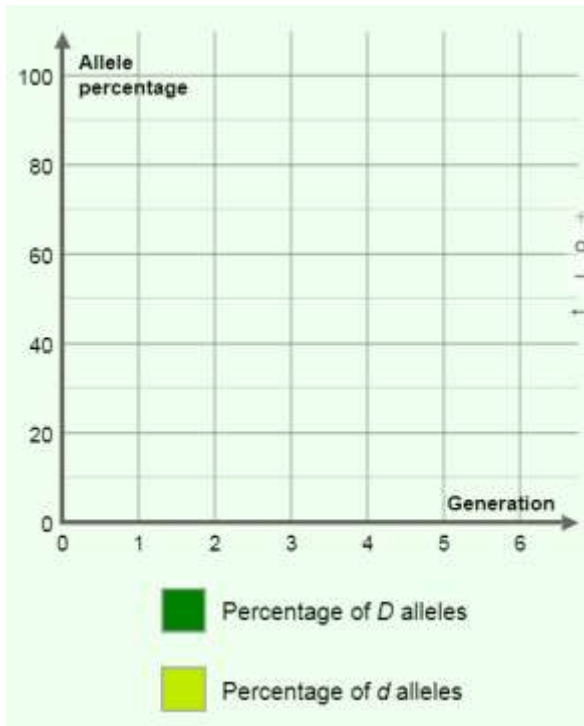
7. What happened to the frequency of each <u>allele</u> over time? Include in your answer the initial and final percentages of each allele.
   • The percentage of D alleles _____

   • The percentage of d alleles _____

8. Describe the conditions for natural selection in this simulation:
   - What was the ultimate source of the genetic diversity and variation of feather color in this population?

   - What was the selective pressure in this simulation?

   - What color of bird had a higher fitness? Explain why.

   - How did each new generation differ from the previous generation, on average? Explain why.

   - Did this population stay the same, adapt, or go extinct? Explain how you know.

9. Explain why doesn't the recessive *d* allele disappear completely even though is gives lower fitness?

10. Why might this be an advantage in case the environment changes in the future?

11. If you change the fitness of the genotypes (in the original *Control* tab), what changes about the simulation. Explain why.

12. If the environment were to suddenly change, what two factors would help the population adapt quickly?

13. If all 3 genotypes have the same fitness, what will happen to the population over time? Explain why. Use the Gizmo to test your prediction.