

Cheat Sheet

Chapter 23 Questions

1. What is *Geospiza fortis*?
2. What is microevolution?
3. What is genetic variation?
4. What is genetic variation at the whole-gene level called? At the molecular level?
5. What is neutral variation?
6. What is a population?
7. What is a population's gene pool?
8. What is the Hardy-Weinberg equilibrium?
9. What are the 5 conditions for Hardy-Weinberg equilibrium?
10. What is adaptive evolution?
11. What is genetic drift?
12. What is the founder effect?
13. What is retinitis pigmentosa?
14. What is the bottleneck effect?
15. What is *Tympanuchus cupido*?
16. What does it mean for an allele to become fixed?
17. What is gene flow?
18. What is *Nerodia sipedon*?
19. What is *Culex pipiens*?
20. What is relative fitness?
21. What is directional selection?
22. What is disruptive selection?
23. What is stabilizing selection?
24. What is sexual selection?
25. What is sexual dimorphism?
26. What is intrasexual selection?
27. In what species does intrasexual selection occur between females?
28. What is intersexual selection?
29. What is balancing selection?
30. What is frequency-dependent selection?
31. What is *Perissodus microlepis*?
32. What is heterozygote advantage?
33. Why can't natural selection fashion perfect organisms?
34. What point mutation causes sickle cell disease?

Chapter 23 Answers

1. (Medium ground finch in Galápagos)
2. Change in allele frequencies in a population
3. Differences among individuals in the composition of their genes or other DNA sequences
4. Gene variability, quantified as the average percentage of loci that are heterozygous
nucleotide variability, generally doesn't result in phenotypic variation
5. Differences in DNA sequence that do not confer a selective advantage/disadvantage
6. A group of individuals of the same species that live in the same area and interbreed,
producing fertile offspring
7. Consists of all copies of every type of allele at every locus in all members of the
population
8. Population that is not evolving (allele and genotype frequencies will remain constant
from generation to generation), concentration of one allele is p , concentration of other is
 q , genotype frequency for homozygote 1 is p^2 , for homozygote 2 is q^2 , heterozygote is
 $2pq$, if population is in equilibrium, it is not evolving
9.
 1. No mutation
 2. Random mating
 3. No natural selection
 4. Extremely large population size
 5. no gene flow
10. Process in which traits that enhance survival or reproduction tend to increase in
frequency over time
11. Unpredictable fluctuation of allele frequencies from one generation to the next especially
in small populations
12. When few individuals become isolated and establish a new population with a new gene
pool
13. Progressive blindness that afflicts homozygous individuals
14. Sudden change drastically reduces population size, causing alleles to be
over/underrepresented and genetic drift to occur (when population recovers size, has
low levels of genetic variation)
15. Greater prairie chicken
16. The allele reaches a frequency of 100%
17. Transfer of alleles into or out of a population due to the movement of fertile individuals or
their gametes (intermixing of populations)
18. Lake Erie water snake
19. Mosquito/vector of West Nile virus and other diseases
20. The contribution an individual makes to the gene pool of the next generation relative to
the contributions of other individuals
21. Occurs when conditions favor individuals exhibiting one extreme of a phenotypic range
(shifts population's frequency curve for the character in one direction)

22. Occurs when conditions favor individuals at both extremes of a phenotype range over individuals with intermediate phenotypes
23. Acts at both extreme phenotypes and favors intermediate variants
24. Process in which individuals with certain characteristics are more likely than other individuals of the same sex to obtain mates
25. Difference in secondary sexual characteristics between males and females of the same species
26. Individuals of one sex compete directly for mates of the opposite sex
27. ring-tailed lemurs and broad-nosed pipefish
28. (aka mate choice) Individuals of one sex are choosy in selecting their mates from the other sex
29. Selection that maintains variation/ two or more phenotypic forms in a population
30. The fitness of a phenotype depends on how common it is in the population
31. Scale-eating fish, population oscillates because less common phenotype is favored
32. When heterozygous individuals have a greater fitness than do both homozygotes
33. Selection can act only on existing variations
 - Evolution is limited by historical constraints
 - Adaptations are often compromises
 - Chance, natural selection, and the environment interaction
34. Adenine replaces thymine