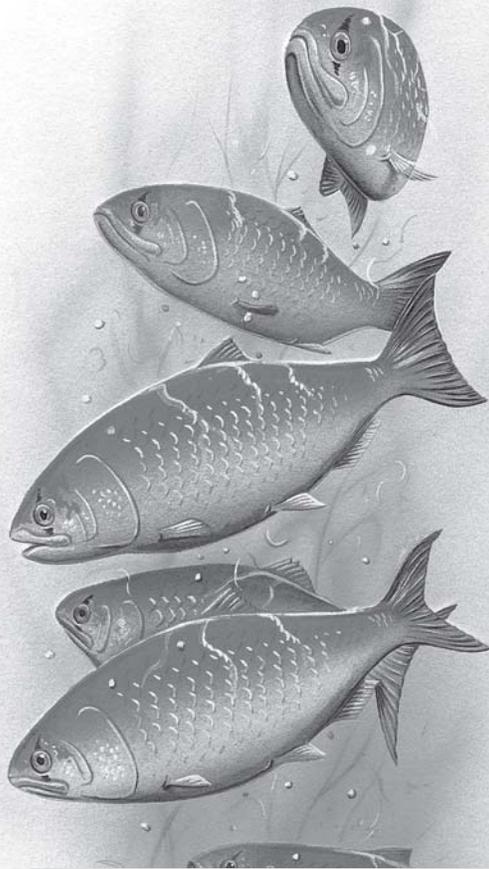




Evolution (Population Genetics)

7 The frequency of an allele in a gene pool of a population depends on many factors and may be stable or unstable over time. As a basis for understanding this concept:

- 7.a *Students know* why natural selection acts on the phenotype rather than the genotype of an organism.
- 7.b *Students know* why alleles that are lethal in a homozygous individual may be carried in a heterozygote and thus maintained in a gene pool.
- 7.c *Students know* new mutations are constantly being generated in a gene pool.
- 7.d *Students know* variation within a species increases the likelihood that at least some members of a species will survive under changed environmental conditions.
- 7.e* *Students know* the conditions for Hardy-Weinberg equilibrium in a population and why these conditions are not likely to appear in nature.
- 7.f* *Students know* how to solve the Hardy-Weinberg equation to predict the frequency of genotypes in a population, given the frequency of phenotypes.



WHAT IT MEANS TO YOU

Some traits are common among individuals, while others are quite rare. If you look around your classroom, you may notice many students with dark eyes. Perhaps only a few have red hair. The frequency of traits in any population depends on how common certain genes are in the gene pool, as well as how the genes themselves are expressed.

STANDARD	CHAPTERS	PUPIL EDITION
7.a	10	304–309
7.b	7, 11	200–203, 335–338
7.c	11	328–329
7.d	10, 11	304–309, 328–329
7.e*	11	340–343
7.f*	11	340–343

SAMPLE QUESTION

1. A hypothetical population of foxes includes individuals with red fur and individuals with brown fur. Fur color is determined by one gene that has two alleles. The allele for brown fur (*B*) is dominant and the allele for red fur (*b*) is recessive. If individuals with red fur are more easily seen by predators, natural selection will *most* likely favor individuals with

7.a

- A brown fur and genotype *BB*.
- B brown fur and genotype *Bb*.
- C brown fur regardless of genotype.
- D red fur regardless of genotype.

Answer: 1c