

13.3 Student Activity Key

Microevolution



Penguin Bay Biology

- Biology Class, Simplified -

You have sampled a population in which you know that the percentage of the homozygous recessive genotype for red hair (rr) is 36%. Using that 36%, calculate the following:

1. The frequency of the "rr" genotype: 36%

36%, as stated in the problem.

2. The frequency of the "r" allele: 60%

The frequency of "rr" is 36%, which means that $q^2 = 0.36$. If $q^2 = 0.36$, then $q = 0.6$. Since q equals the frequency of the "r" allele, then the frequency is 60%.

3. The frequency of the "R" allele: 40%

Since $q = 0.6$, and $p + q = 1$, then $p = 0.4$. The frequency of "R" is equal to p, so the answer is 40%.

4. The frequency of the "RR" genotype: 16%

The frequency of the "Rr" genotype: 48%

The frequency of "RR" is equal to p^2 and the frequency of "Rr" is equal to $2pq$. Therefore, the frequency of "RR" is 16% (p^2 is $0.4 \times 0.4 = 0.16$) and "Rr" is 48% ($2pq = 2(0.4 \times 0.6) = 0.48$).