

Chapter 4, Genetics and Cellular Function

“Apply What You Know” Answers

- p. 115—The base sequence complementary to ATTGACTCG would be TAACTGAGC. The DNA described would be 30% cytosine. Since DNA is equal parts adenine and thymine, and we know it is 20% adenine, the total adenine + thymine is 40%. This leaves 60% of the molecule divided equally between cytosine and guanine, at 30% each.
- p. 129—A cell has 92 molecules of DNA from the end of the S phase until telophase. This is because it has 46 chromosomes; after the S phase each chromosome has two chromatids; and each chromatid contains one molecule of DNA.
- p. 132—At interphase, a cell’s chromatin is too thinly dispersed to be visible with the light microscope. At metaphase, the chromatin is maximally condensed into compact, easily viewed chromosomes.
- p. 133—Yes, she could, provided the father had genotype CC or Cc (C = cleft, c = uncleft). To illustrate, change the top row of the Punnett square in figure 4.18 to show c and c in both eggs but leave the sperm the same (representing a heterozygous father). The top two cells of the 2×2 square will then show genotypes Cc in the offspring—both of which would produce cleft chins like the father’s.
- p. 133— A person only has two parents, and can only get one of these alleles from each parent. So even if there are three or more alleles for one gene locus in the population as a whole, any one individual can only inherit two of those.