

Name \_\_\_\_\_

**AP Biology**  
**Chapter 21 - Genomes and Their Evolution**

**Guided Reading Assignment Campbell's 10<sup>th</sup> Edition**

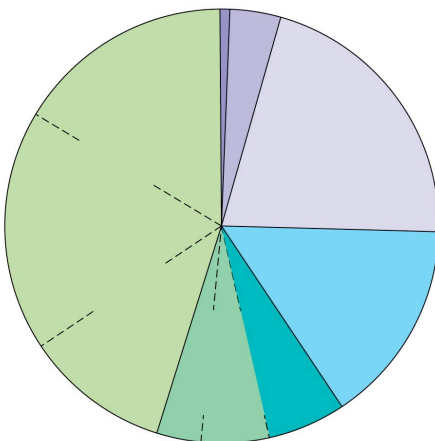
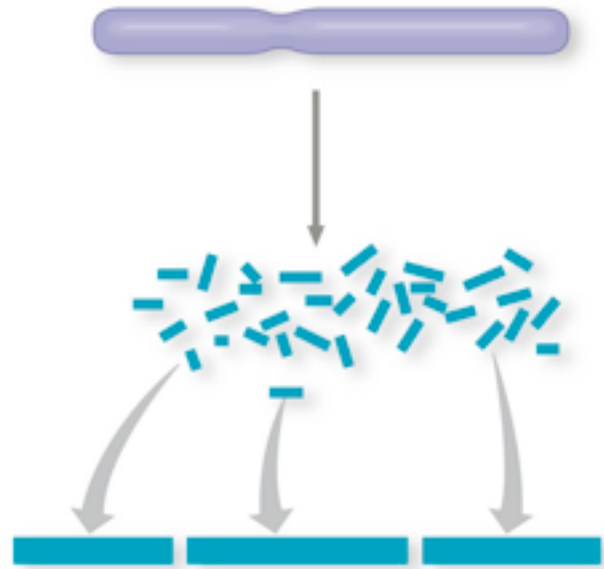
**Essential Knowledge**

3.C.1 Biological systems have multiple processes that increase genetic variation

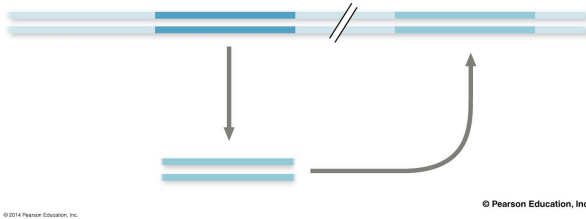
4.C.1 Variations in molecular units provides cells with a wider range of functions

LO 3.26 The student is able to explain the connection between genetic variation in organisms and phenotypic variation in populations.

1. What was the goal of the human genome project?
2. Label the 4 steps shown in the diagram of the whole-genome shotgun approach
3. After the human genome was sequenced, how was that data analyzed and shared?
4. What is a proteome?



5. Why might it be more practical to study proteomes than genomes?
6. Label the diagram to show exons, regulatory sequences, noncoding DNA, and repetitive sequences.
7. What percentage of the human genome is devoted to actively transcribed and translated genes?



8. What happens during transposition?

9. Label the transposon, the copy and inserted gene in the diagram

10. How do transposons contribute to genome evolution?

11. How are short tandem repeats useful in biotechnology? (refer back to page 431)

12. How does each of the following contribute to genome evolution?

a. Duplication

b. Rearrangement

c. Mutation

13. Describe how genome sequencing can be used to understand evolutionary relationships

14. Some regions of the genomes are more similar than others. These similar regions are *highly conserved*. Why are some genes more likely to be conserved than others?

15. What does the field of evo-devo study?

16. What is the significance of a homeobox?

17. Different animals have similar conserved genes repeated in different body segments. How does the regulation of these genes lead to different traits?

