

Key Concept 6: Biotechnology

Learning Objectives

Students will be able to ...

GEN 6.1(a) Use data to examine inheritance and/or chromosomal disorders.

GEN 6.1(b) Describe techniques used to manipulate DNA.

GEN 6.1(c) Explain potential benefits and/or consequences of manipulating DNA of organisms.

Essential Knowledge

Students need to know that ...

GEN 6.1.1 Biotechnology enables scientists to study and engineer heritable traits of organisms.

- a.** Karyotypes are used to examine inheritance and help identify and predict possible chromosomal genetic disorders.
- b.** Diverse methods, including PCR, gel electrophoresis, and DNA profiling, are used to study organisms' DNA.
- c.** Genetic engineering techniques (e.g., cloning, GMOs) can manipulate the heritable information of DNA, resulting in both positive and negative consequences.

Content Boundary: Students will not be assessed on a deep understanding of the molecular processes for manipulating DNA. Instead the *focus* should be on giving a high-level understanding of common processes that allow development of appropriate sizes of DNA to be studied and manipulated. Also, students should learn about exciting new advancements in this field.