



Yale-New Haven
Teachers Institute®

Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2019 Volume III: Human Centered Design of Biotechnology

Introduction to Biotechnology

Guide for Curriculum Unit 19.03.08
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This unit exposes 10th or 11th grade Chemistry, Physical and Environmental Science students to basic concepts of Biotechnology. Students will learn that, through the use of Biotechnology, scientists and engineers are able to modify genetic structure in animals and plants to improve them for the development of beneficial products. In this unit, students will be introduced to specific biotechnology aspects of genetic engineering, artificial tissue development, tissue regeneration and tissue culture in which fragments of living tissue from an animal or plant are transferred to an artificial environment in which they can continue to survive and function.

In order to understand these larger concepts, the unit contains a short presentation of “Molecules of life”, exposing students to the fundamentals of proteins, carbohydrates, lipids, nucleic acids and their components. Concepts in biotechnology development will be accompanied by a two week lesson plan that provides real-world examples and hands-on laboratory protocols.

Students will explore what is Biotechnology as a branch of Science and explain its role in everyday life. They will also study and conduct experiments in testing proteins, carbohydrates, lipids and learn about fermentation process. Teachers will use the concepts of Biotechnology to expose students to organic chemistry concepts such as carboxylic acids, amines, and introduce students to the basic nomenclature of these organic compounds.

(Developed for Engineering, grade 8; recommended for Chemistry and Environmental Science, grade 10, and Physical Science, grade 11)

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