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Amazing Dna Molecule: Its History, Structure and Function

Guide for Curriculum Unit 99.05.02
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This curriculum unit is intended for high school [college level or higher] biology students yet it can be modified to accommodate all learning backgrounds. Detailed lesson plans, which adhere to the CCI (Connecticut Competency Instrument) and state standards, will be included in this unit. It is intended that this unit be presented after both basic chemistry and the macromolecules of life have been thoroughly described and discussed since an understanding of these topics is essential for this unit to proceed as it is designed.

The purpose of this unit is to reveal the rich history in the race to discover the double helix, to exemplify the relationship between structure and function, to integrate the use of modern technology and to include a discussion of ethics into these topics. I have taken an interdisciplinary approach, and integrated science with history, mathematics, ethics and technology in an attempt to make the unit more exciting and learning more meaningful. Terms that need defining are bolded (usually just once) and can be found in Appendix A- the glossary.

Most of my students are familiar with the name DNA (deoxyribonucleic acid), yet many don't grasp the concept of what DNA actually is and what is does in the cells of our bodies. The ultimate goal of this unit is to bring forth marvel and respect and for this amazing DNA molecule as well as an understanding of its structure and function. Molecular biology is a branch of science that focuses on the pathway from DNA to the protein it codes for. The Central Dogma of molecular biology is that pathway: DNA -> messenger RNA -> protein. With this foundation, students will be better equipped to make sense of the modern technological advances in molecular biology and the implications they have on medicine and society. In addition, students will be empowered with the skills of critical and logical thinking which will be a tool they will use both inside and outside of the classroom.

The learning objectives of this unit are that students will be able to: relate and cite history as it applies to scientific discovery; develop an understanding of the structure and function of DNA; examine and respond to the relationship of structure and function; manage and apply learning when examining technology and ethics; and to develop marvel and respect for this amazing DNA molecule.

(Recommended for Biology, grades 9-12.)