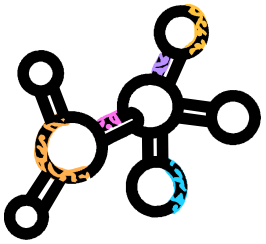
WHAT DO STUDENTS LEARN IN TECHNOLOGY EDUCATION?

In a word, it is about INNOVATION! It is about how people think! It is how to apply technology in the solutions of problems facing society. The aim is to solve problems and create opportunities within a realistic context. That context can start with the student's everyday environment and progressively move into more global issues.

Examples of technology problems and learning situations could be the cleaning of a stream that has become polluted, the creation and fabrication of an invention to solve a household problem, or designing and building of a habitat for a unique situation. The thinking process is closely related to that of an engineer, hi-tech worker, designer, or architect.

Students apply their ingenuity with tools, materials, processes, and resources to create solutions and opportunities for themselves and others. The nature of learning goes from the very early years of just "knowing" to more developed applications that might relate to the medical, agricultural, energy and power, information and communication, transportation, manufacturing, and construction technologies. It is a new and dynamic subject in our schools that is as fast moving and as up-to-date as the thinking of technology in our society! It is the future workforce thinking!

Adapted from An Educational Imperative, ITEA 2005.



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Indiana Department of Education

INDIANA TECHNOLOGY EDUCATION

BIOTECHNOLOGY

PROJECT LEAD THE WAY

TECHNOLOGY EDUCATION

ARE STUDENTS READY for the technological and engineered world? This question is more important today than ever before. As most kids play with technology, a central question that occurs is do they know what they can **DO** with it? Technology Education is the answer. Students who study technology apply problem-based learning that integrates (STEM) Science, Technology, Engineering, and Mathematics.

Students learn important skills and concepts needed for the workforce and society. This standards based curriculum can become a springboard for career exploration as well as a basis for determining personal goals for higher education.

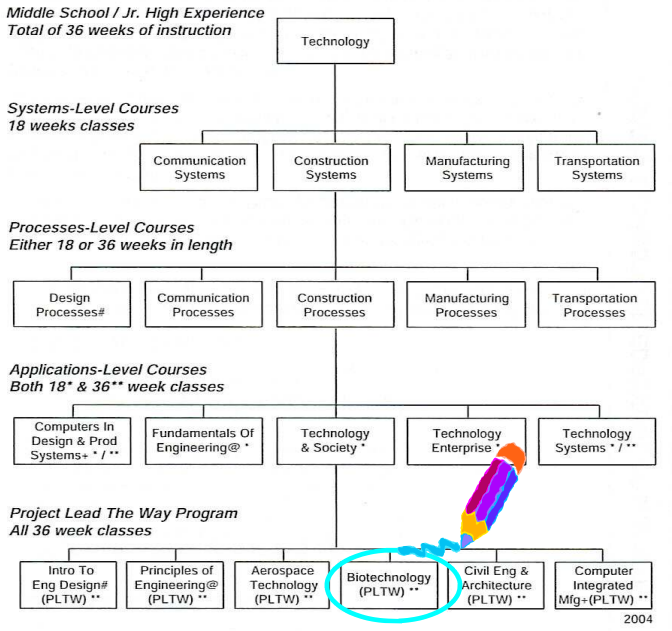
The Curriculum- The Indiana Technology Education curriculum is a **standards-based**, hands-on, minds-on program that applies and integrates academic concepts from Science, Technology Engineering, and Mathematics (STEM). The curriculum is designed for all students.

Biotechnology #4818

This course should introduce students to the fundamental aspects of biotechnology and the engineering technologies related to this emerging field. Instruction will emphasize how engineering and technology processes can be used to create new products. Engineering principles will be used in conjunction with scientific knowledge to explore and investigate such areas as: development of biomedical devices; pharmaceutical and medical therapies; and agricultural research and development. Students will learn how new products are developed and produced and will have opportunities to discuss the impact of these technological advances on society.

- Only those schools having a signed agreement with the national Project Lead The Way organization can use this course title.
- Suggested Grade Levels: 11-12
- Recommended Prerequisites: Completion of two Project Lead The Way courses
- A two credit course over two semesters.
- A Core 40 directed elective as part of a technical career area.
- This course qualifies as an Academic Honors Diploma elective.
- Schools involved in Project Lead The Way must use the content standards developed for this pre-engineering program.
- This course is a component of the Engineering, Science and Technologies and Health Services career clusters. It may also be included as part of the Manufacturing and Processing career cluster.

INDIANA TECHNOLOGY EDUCATION CURRICULUM



PLTW titles of **Digital Electronics** and **Engineering Design and Development** appear under the multidisciplinary category of the Indiana Department of Education guidelines.

All Technology Education courses are **Core 40 Directed Electives** as a part of a Career & Technical Area. These courses can be used in creating **4-year course plans and Career Academic Sequences** to support students in earning 8-10 credits for the Core 40 with Technical Honors Diploma.

Students working on an **Academic Honors Diploma** may also apply Technology Education credits toward their electives.

*Note- Project Lead The Way Biotechnology Curriculum Pilot in Progress

Topics of Study

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- **Introduction To Biotechnical Engineering** Historical roots of Biotechnical Engineering, Biotechnical Engineering Industry, Biotechnical Engineering Procedures
- **Genomics** Reverse Engineering, Bioinformatics, Rapid Pathogen Identification, CSI- Engineers Needed, Designer Genes, Industrial Application of Genetic Modification
- **Bioprocesses** Biopharma, Drug Production and Isolation, Controlling Biological Processes, Agricultural Bioprocesses, Aquaponics
- **Environment** Environmental Remediation, Remote Phytoplankton Quantification
- **Biomedical** Biomedical Devices, Orthopedics Cardiovascular Devices, Biomedical Imaging

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