

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.

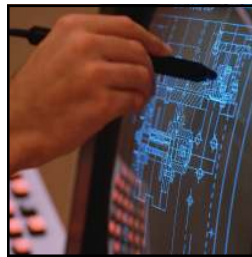
Students apply their ingenuity with tools, materials, processes, and resources to create solutions and opportunities for themselves and others. The nature of learning goes from the very early years of just "knowing" to more developed applications that might relate to the medical, agricultural, energy 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



GATEWAY TO TECHNOLOGY 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.

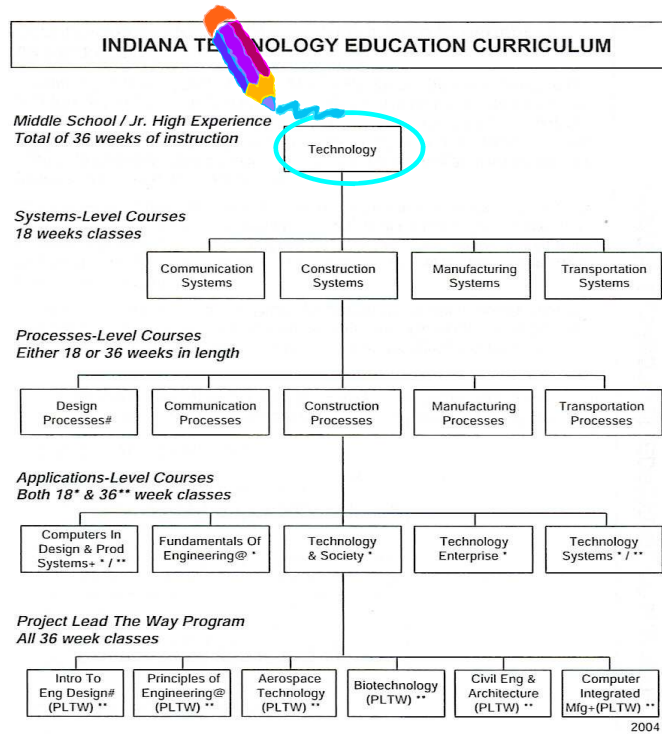
JR High/Middle -Gateway To Technology



Gateway To Technology's cutting-edge program addresses the interest and energy of middle school students, while incorporating national standards in math, science and technology. GTT is "activity oriented" to show students how technology is used in engineering to solve everyday problems. The four instructional units excite and motivate students to use their imaginations and teach them to be creative and innovative, while gaining the skills they need to develop, produce and use products and services.

The Gateway To Technology curriculum provides project-based learning—a hands-on approach—that is exciting and fun for the full-range of students in today's grade 6 – 8 classrooms and that relates technology to students' daily lives. It also promotes communication and collaboration by emphasizing a teaming approach in the instructional units. This approach utilizes the strengths of each team member to accomplish the goals of the project, while offering students learning challenges at all ability levels.

The math, science, and technology integrated GTT program helps students develop and hone skills in middle school that enable them to enter the high school program with foundation knowledge and skills for success in pre-engineering. Although not intended as an introduction to the PLTW pre-engineering high school program, many schools report improved interest in the high school program because of Gateway to Technology.



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.



Topics of Study

Gateway To Technology consists of four independent units that should be taught in conjunction with a rigorous academic curriculum. The units are designed to challenge and engage the exploratory minds of middle school students. Each 10-week unit contains performance objectives and suggested assessment methods. The four units are:

●Design and Modeling

This unit uses solid modeling (a very sophisticated mathematical technique for representing solid objects) to introduce students to the design process. Utilizing this design approach, students understand how solid modeling has influenced their lives. Students also learn sketching techniques, and use descriptive geometry as a component of design, measurement, and computer modeling. Using design briefs or abstracts, students create models and documentation to solve problems.

●The Magic of Electrons

Through hands-on projects, students explore the science of electricity, the movement of atoms, circuit design, and sensing devices. Students acquire knowledge and skills in basic circuitry design and explore the impact of electricity on our lives.

●The Science of Technology

This unit traces how science has affected technology throughout history. Students learn about the mechanics of motion, the conversion of energy, and the use of science to improve communication.

●Automation and Robotics

Students trace the history and development of automation and robotics. They learn about structures, energy transfer, machine automation, and computer control systems. Students acquire knowledge and skills in engineering problem solving and explore requirements for careers in engineering.

New Developments

●Aerospace Engineering

The Aerospace Engineering curriculum will be a systemic curriculum package that will introduce students to the world of aeronautics, flight, and engineering. Students at the middle school level will begin to make connections with their project-based experiences and the subjects of science, mathematics, and technology education in the "Flight and Space Unit."