



*Forging the Innovation Generation:  
Biomedical Sciences*

Find out what you can do to help students prepare for a successful future in the biomedical sciences.

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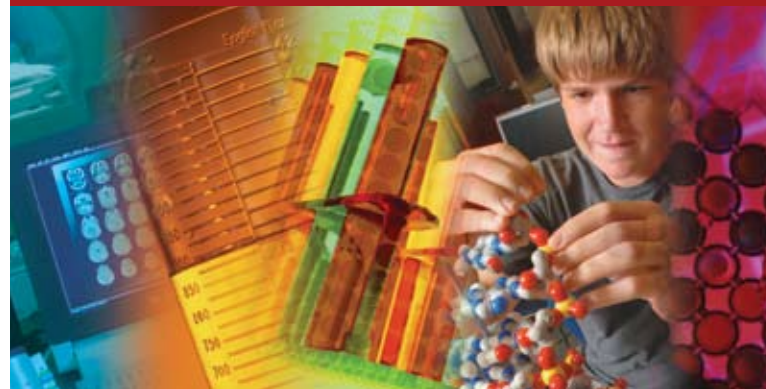
“*The instructors are very knowledgeable in science here. We’ve learned about how the body works and we’re in the process of learning medical terminology that will help me in my career as a pediatrician.*”

—Antonio Newbill,  
Summit Technology Academy,  
Lee’s Summit, Missouri

PLTW: Forging the Innovation Generation



# Biomedical Sciences



## *An abridged introduction for schools*

- Overview
- Curriculum
- Benefits



## Limitless Possibilities

*Demographic changes are driving the need for health care professionals*

### BOOM!

**T**hat’s the impact the nearly 80 million Americans born between 1946 and 1964 have made on how our nation lives, works, studies, and plays for the past few decades. And now that the first wave of these U.S. “baby boomers” is approaching age 65, their sheer numbers are creating a gigantic boom in the need for health- and science-related innovations, opportunities, careers, and services.

The beneficiaries of this aging explosion will be the next generation of biomedical science professionals: today’s students.

According to the Bureau of Labor Statistics (BLS), the health services sector is projected to grow more than any other industry (about 30.3 percent) through 2014. Our nation’s aging population—combined with longer life expectancies and rapidly advancing technology—has created a growing demand for highly skilled professionals in a broad spectrum of health care and science careers. These include paramedics, biomedical engineers, medical illustrators, occupational and physical therapists, medical physicists, scientific and pharmaceutical researchers, forensic scientists, doctors, nurses, and radiological and surgical technicians.



In Lee’s Summit, Missouri, Summit Technology Academy students design and build a pump in their Principles of the Biomedical Sciences class. (From left) **Kevin Gray**, **Kailey Shockley**, instructor **Peggy Hinzman**, and **CiCi Williams**.

The career possibilities are limitless for young people with a solid foundation in health and science. And that’s precisely what the Project Lead The Way® (PLTW) Biomedical Sciences curriculum offers to U.S. students, teachers, and schools. Rigorous and relevant, the program is a series of four courses that prepare students for postsecondary education in biomedical fields.

To learn more, look inside.

“*One of the most exciting ways we are preparing students for careers in the biosciences is through the Project Lead The Way Biomedical Sciences Program. The program involves both rigorous and engaging instruction in STEM—science, technology, engineering, and mathematics. By developing cutting-edge programs like Biomedical Sciences, we are expanding students’ access to STEM-related career opportunities abundant in Maryland, as well as to the global economy.*”

— Dr. Nancy Grasmick, Maryland State Superintendent of Schools, Baltimore, Maryland



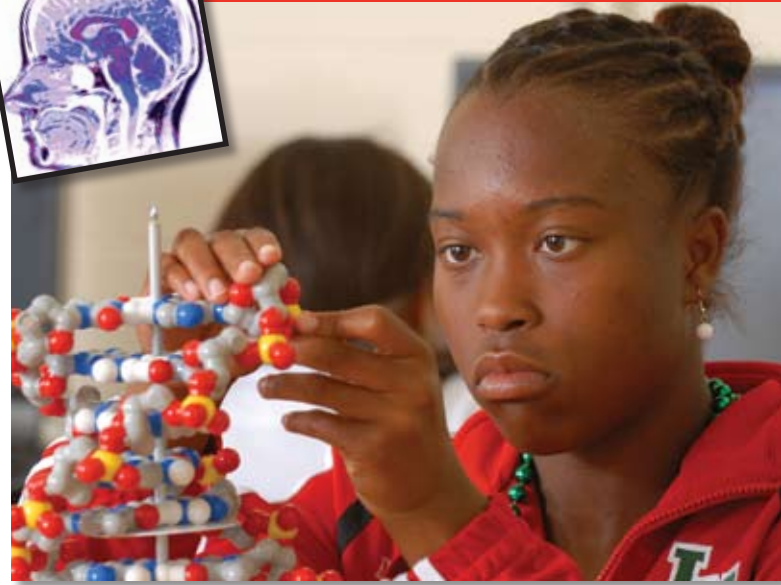
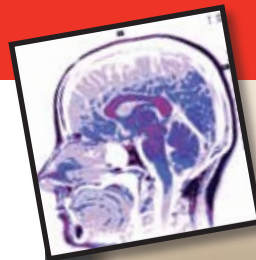
## The Sequence of Success

**A**lthough the Project Lead The Way® (PLTW) Biomedical Sciences curriculum is new, the organization's commitment to education improvement is not. Since 1997, the PLTW model of combining a rigorous and relevant curriculum with project- and problem-based instruction has helped transform engineering and STEM (Science, Technology, Engineering, and Mathematics) education in the United States. Today, there are more than 2,000 PLTW schools in 49 states and the District of Columbia, educating more than 175,000 students.

The sequence of high school courses in the Biomedical Sciences Program parallels the proven PLTW engineering curriculum. The initial program includes four courses, all aligned with appropriate national learning standards:

- Principles of the Biomedical Sciences™
- Human Body Systems™
- Medical Interventions™
- Science Research™

The first course, Principles of the Biomedical Sciences™ is being piloted during the 2007–08 school year in 42 schools located in the seven states that provided funding to develop the program. In 2008–09, the second course will be added, followed by the third in 2009–10, and the fourth in 2010–11. The program's development has been underwritten by grants from the departments of education for Connecticut, Maryland, Missouri, Ohio, Oklahoma, and South Carolina, and the Department of Workforce Development for Indiana.



**Dhana Clarke**, a student at McKenzie Career Center in Indianapolis, Indiana, works with a model of the DNA molecule.

### The PLTW Professional Development and Support System

Like all other PLTW program teachers, each PLTW Biomedical Sciences teacher participates in a world-class professional development program, and can access ongoing peer and technical support at the local, state, regional, and national levels.

Everyone teaching PLTW courses goes through an extensive professional development process, including an intensive, two-week PLTW Summer Training Institute. During these sessions, teachers experience the classes as their own students will, giving them invaluable insights into how to make the courses as engaging as possible when the educators teach them during the school year.

### APPB Learning

The PLTW approach is simple—and effective. By being engaged in hands-on, real-world projects, the students begin to understand how the skills they are learning in the classroom can be applied in everyday life.

This approach is called activities-based, project-based, and problem-based (APPB) learning. Research shows that schools participating in APPB-learning experience increased student motivation, cooperative learning skills, and higher-order thinking.

But APPB-learning is only part of the reason that PLTW works for schools, teachers, and students nationwide. PLTW also links demanding mathematics and science concepts with top-quality academic and technical instruction.



**Bryan Castillo** looks through a microscope during his Biomedical Sciences class at Fort Mill High School in Fort Mill, South Carolina.

### A Golden Opportunity

That means to succeed in this program a kid has to be a math and science whiz, right?

“Any student who is interested in biomedical sciences can succeed in this curriculum,” says Dr. Carolyn Malstrom, director of curriculum for PLTW Biomedical Sciences. “But many kids will never know if they are interested because they’ll never get a chance to learn what opportunities are available. The PLTW approach is to introduce students to the curriculum so that they can discover whether or not it interests them. Since the courses are hands-on, project-based, and problem-based, any student can be successful.”

## Dreams Come True

### Students Can Be Biomedical Sciences Superstars

**P**lenty of young people dream about becoming a sports hero, rock star, or famous actor. That's normal and it's fun, but in most cases, the dream will always be just that—a dream.

That doesn't mean, however, that kids can't grow up to be superstars. Today's heroes aren't the only ones scoring touchdowns and making movies—they're also the ones finding cures to diseases, using advanced forensic techniques to solve crimes, developing high-tech medical devices that improve and save lives, and providing the expert care that helps patients reach their highest potential for health.

The education requirements for biomedical sciences careers vary from graduate degrees for doctors, veterinarians, and research scientists to one-year to four-year programs for radiological and surgical technicians or physical therapy assistants.

Biomedical sciences is cutting-edge, it's exciting, and it's a field where any kid who wants to be a superstar can find a place to shine.

“I want to be a surgeon or an ER doctor and Biomedical Sciences helps with systems interactions, medical terms—and it's just really neat.”

—Tori Shaffer,  
Summit Technology Academy,  
Lee's Summit, Missouri



“Villa Julie College is proud to serve as a University Affiliate for the new Project Lead The Way Biomedical Sciences Program. We have a rich history of providing high-quality, career-oriented programs at the College, in which inquiry-based, hands-on, applied learning is paramount. This PLTW Biomedical Sciences Program furthers our collective efforts to prepare an educated, creative, and motivated STEM workforce that will contribute to meeting the global challenges of the twenty-first century.”

— Kevin J. Manning, Ph.D., President, Villa Julie College, Baltimore, Maryland