

Project Lead the Way Biomedical Sciences Program



Perryville High School
School of Technology

PLTW Biomedical Sciences Program in CCPS

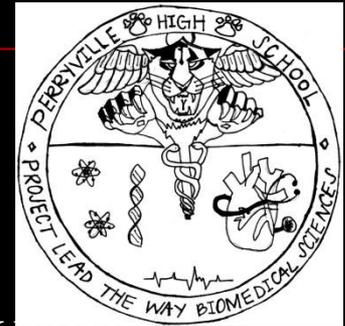
Engaging and preparing students for careers in medicine, healthcare and science.

- CCPS Piloted each of the 4 courses for PLTW at PHS from 2007 to 2011.
- Grant awards totaling \$105,000.00 from MSDE since 2006
- College Credit/MSDE Certified program at PHS
- Expansion in CCPS
 - \$65,000 awarded in grants from MSDE
 - New PLTW Biomedical Sciences program opened at CCST 2015- 2016
 - Two teachers being trained for PLTW certification (over past two and next two summers)

At Perryville High School:



- 2014-2015 will be the eighth year of implementation of the program.
- Principles of Biomedical Sciences: 8th year
- Human Body Systems: 7th year
- Medical Interventions: 6th year
- Honors Biomedical Innovation: 5th year
 - Totaling approximately 100 CTE completers and 300 CTE concentrators





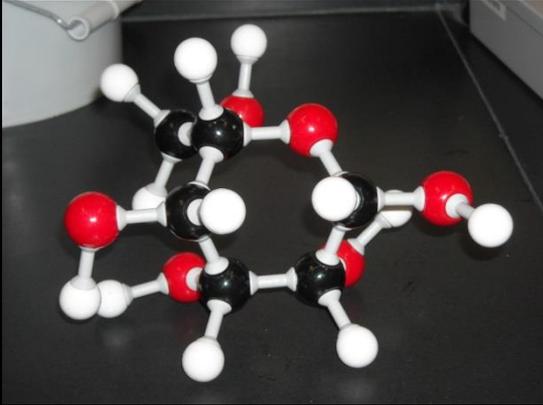
PLTW Biomedical Sciences Program

Sequence of Courses:

- Principles of the Biomedical Sciences (PBS)
- Human Body Systems (HBS)
- Medical Interventions (MI)
- Biomedical Innovations (BI)



Principles of Biomedical Sciences (PBS)



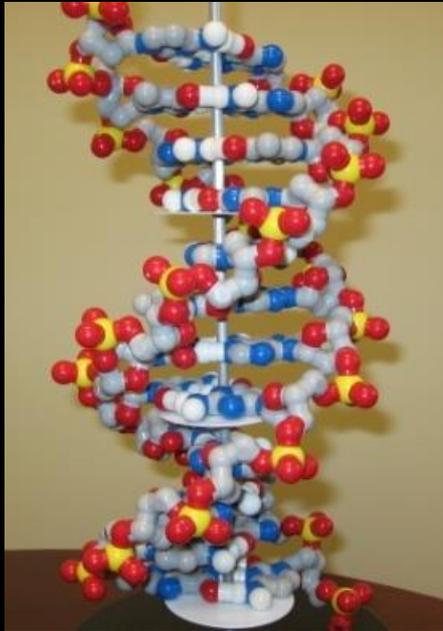
Student work involves the study of human medicine, research processes and an introduction to bioinformatics.

Students investigate the human body systems and various health conditions including: heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases.



Principles of Biomedical Sciences

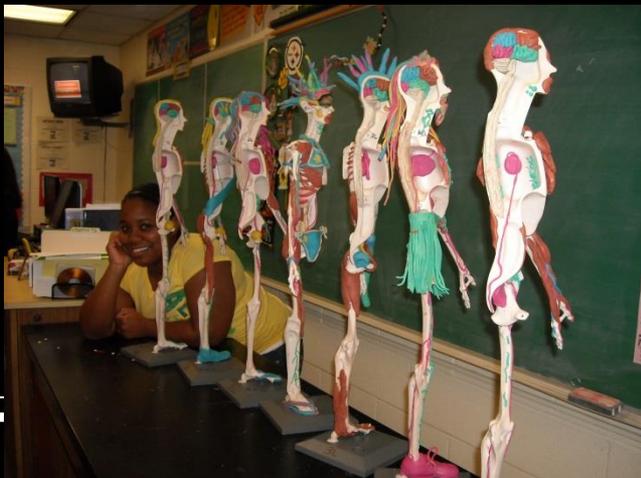
Key Topics



- Literary Research Skills
- Human Body Systems
- Basic Chemistry
- Structure and Function of DNA
- Bioinformatics
- Protein Structure
- Causes of Infectious Diseases
- Grant Proposals
- Career Exploration

Human Body Systems (HBS)

Students study basic human physiology, especially in relationship to human health. A central theme is how the body systems work together to maintain internal balance and good health.



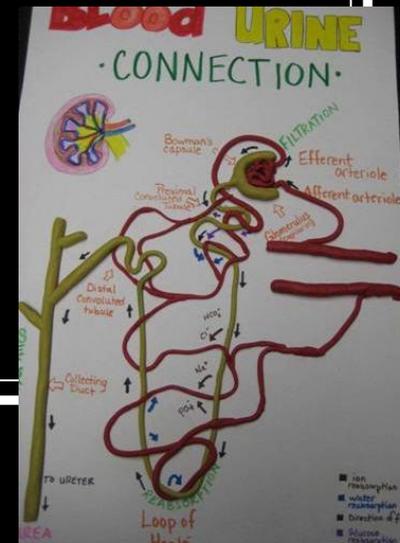
Students use data acquisition software to monitor body functions and use the Anatomy with Clay® Manikens™ to study body structure.

Human Body Systems

Key Topics



- Relationship between structure and function
- Maintenance of health
- Defense against disease
- Communication within the body and with the outside world
- Movement of the body and substances around the body
- Energy distribution and processing



Medical Interventions (MI)

Students study the variety of medical interventions involved in the prevention, diagnosis and treatment of disease as they follow the lives of a fictitious family.



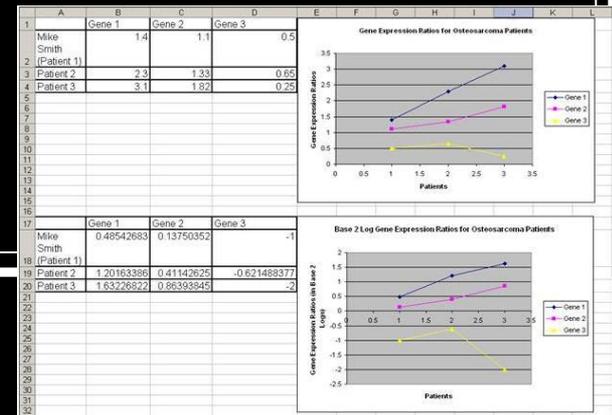
Student projects investigate interventions related to diagnostics, immunology, surgery, genetics, pharmacology, medical devices, and lifestyle choices.

Medical Interventions

Key Topics



- Molecular biology and genetic engineering
- Design process for pharmaceuticals and medical devices
- Medical imaging, including x-rays, CT scans, and MRI scans
- Disease detection and prevention
- Rehabilitation after disease or injury
- Medical interventions of the future



Biomedical Innovations (BI)

Students apply their knowledge and skills to answer questions or to solve problems related to the biomedical sciences.



Students will design innovative solutions for the health challenges of the 21st century. Students are expected to present the results of their work to an adult audience, which may include representatives from the local healthcare or business community or the school's PLTW partnership team.

Biomedical Innovations Key Topics



- Capstone Course
 - Independent Scientific Research Experiment
 - Capstone Project Gallery Walk since 2011
- Progressively challenging problems
- Flexible design
- Apply knowledge from all previous
- Design innovative solutions to 21st century health challenges
- Opportunity to work with a mentor during an internship



In the words of the teachers...

“It is a great feeling when they [the students] realize that there is nothing they can’t do....There is no problem that they cannot approach or solve with the tools they’ve acquired in PLTW biomedical sciences.”

“I love it!!!”

“The content strength of the curriculum complements my passion for kids and creates a vibrant classroom environment.”

“The strength of the PLTW curriculum is the amazing, exploration based activities and projects that connect student learning to real life application.”

In the words of the students...

“One thing I like about this class is the hands-on work. And the labs give the students a better opportunity to comprehend and master these medical concepts”

“It’s a lot of work but very fun and I have got a lot out of this class”

“The Project Lead the Way program is super intense. It’s a lot of independent [and group] study but the labs are really cool too! It is a great experience and will definitely prepare you for the future.”

“You may feel overwhelmed by the amount of time it takes to do the work, but in the end you will feel accomplished and proud.”

In the words of the students...

“I find this group of courses to be very beneficial for those who are thinking of pursuing a career in the health field.”

“This class is very challenging and helps to prepare you for college. The work we do is different from other classes and you learn many interesting things.”

“After taking this class I feel prepared and confident that I could go into a medical profession.”

“Hard work, but worth it.”

“If you want to go in the medical field or sciences this class is great. Human Body Systems is very hands on and is a great way to learn.”

Citations

- Durmowicz, Ph.D., M., Gorman, Ph.D., S., and Schmidhauser, M.S., C. (2010). Reigniting the Passion: A public-private partnership model for teacher professional development. National Science Teacher Association conference. Philadelphia, PA.
- Project Lead the Way [Internet]. 2009. Albany, NY Programs and Support. [accessed 10 March, 2010]. Available from: <http://beta.pltw.org/our-programs/our-programs>