

HEALTH SCIENCES CLUSTER

Project Lead the Way (PLTW): Biomedical Sciences

The Project Lead the Way Biomedical Sciences program is a dynamic high school program which uses real-world problems to engage and challenge students. Students interested in math, science and the human body will find the PLTW Biomedical Sciences program a great introduction to numerous medical fields. It also teaches how the skills they learn are used in the biomedical sciences.

T56101 PLTW Principles of the Biomedical Sciences (5218)
Open to grades 9, 10, 11, 12
2 semesters, 1 credit per semester
Approximate cost per semester: TBD
Meets requirements: THD, AHD, Core 40
Prerequisites: Enrolled in Biology, college prep math and science

Science Note: This course counts towards Core 40 science credits.
Students explore the concepts of human medicine and are introduced to research processes using applied math and science to solve problems. Hands-on, interactive projects enable students to investigate human body systems and various health conditions, including heart disease, diabetes, sickle-cell disease, hypercholesterolemia and infectious diseases. Key biological concepts include homeostasis, metabolism, inheritance of traits, feedback systems and defense against disease. Engineering principles such as the design process, feedback loops, fluid dynamics and the relationship of structure to function will be included where appropriate.

T56201 PLTW Human Body Systems (5216)

Open to grades 10, 11, 12
2 semesters, 1 credit per semester
Approximate cost per semester: TBD
Meets requirements: THD, AHD, Core 40
Prerequisites: PLTW Principles of the Biomedical Sciences, college prep math and science

Science Note: This course counts towards Core 40 science credits.
Students learn anatomy and physiology of the human body through a hands-on approach. Using real-world cases, students take the role of a biomedical professional and work together to solve medical mysteries. Hands-on, interactive projects include designing experiments, investigating the function and structures of the human body through dissections, clay modeling, laboratory analysis, and using data acquisition software to monitor body functions such as reflex, muscle movement, and lung capacities. Students learn to assess and monitor body systems and how they work together.

T56301 PLTW Medical Interventions (5217)

Open to grades 11, 12
2 semesters, 1 credit per semester
Approximate cost per semester: TBD
Meets requirements: THD, AHD, Core 40
Prerequisites: Principles of the Biomedical Sciences, Human Body Systems

Science Note: This course counts towards Core 40 science credits.
Students investigate various medical interventions that extend and improve the quality of life including gene therapy, pharmacology, surgery, prosthetics, rehabilitation and supportive care. The course explores the design and

development of various medical interventions such as vascular stents, cochlear implants, and prosthetic limbs. In addition, students review the history of organ transplants and gene therapy and stay updated on cutting-edge developments via current scientific literature. Using 3D imaging, data acquisition software and current scientific research, students design a product that can be used as a medical intervention.

T56401 PLTW Biomedical Innovation (5219)

Open to grade 12

2 semesters, 1 credit per semester

Approximate cost per semester: TBD

Meets requirements: THD, AHD, Core 40

Prerequisites: Principles of the Biomedical Sciences, Human Body Systems, and Medical Interventions

Dual Credit Available if student successfully completes all four courses in the pathway.

Science Note: This course counts towards Core 40 science credits.

Note: With approval, qualified PLTW student may use this project for their Senior Project at CEHS and CNHS.

Biomedical Innovation is the fourth and final Project Lead the Way Biomedical Science course. It is intended to follow the third course, Medical Interventions. In this capstone course students will design and conduct experiments related to the diagnosis, treatment, and prevention of disease or illness. They will apply their knowledge and skills to answer questions or to solve problems related to the biomedical sciences. They will work to design an effective emergency room, explore human physiology, and design a medical innovation. A theme through the course is to determine the factors that led to the death of a fictional person. Through this approach, students will investigate public health issues and forensic autopsy to determine preventative strategies for prolonging a person's life. They may work with a mentor

or advisor from a university, hospital, physician's office, or industry as they complete class projects.

T56211 Medical Terminology (5274)

Open to grades 11, 12

1 semester, 1 credit per semester

Approximate cost per semester: TBD

Meets requirements: THD, AHD, Core 40

Prerequisite(s): Biology

Dual Credit Available

Learn a new language in this one semester elective. Students will learn to define and use medical terminology correctly and will become proficient in pronouncing and spelling medical terms. Students will utilize videos, presentations, and hands-on experiences to enhance learning. This course will provide a solid foundation in medical terminology for any student considering a career in health science.

T56612 Dental Careers I (5203)

Open to grades 10, 11, 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Recommendation(s): T56101 PLTW Principles of the Biomedical Sciences, OR T56201 PLTW Human Body Systems
Dual Credit Available

This course provides entry-level training for a career in the profession of dentistry. Dental Careers I offers hands-on experience as well as classroom instruction. Emphasis is placed on the clinical environment, chairside procedures, dental materials, placing restorations, equipment and instrument identification, tray set-ups, sterilization, and characteristics of microorganisms and disease control. In addition, oral, head and neck anatomy, basic embryology, histology, tooth morphology, charting dental surfaces, and illness are all introduced. Simulated in-school laboratories are included to provide opportunities for students to further develop clinical skills and the appropriate ethical

behavior. Students will have the opportunity to complete a 4-8 hour dental office observation during this course.

T56622 Dental Careers II (5204)

Open to grades 11, 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Required Prerequisite(s): T56612 Dental Careers I

Dual Credit Available

This course provides the student with more extensive training as a Dental Professional. There is an excellent opportunity for increased skill development in clinical support and business office procedures. The student will perform more complex procedures during in our simulated laboratory, such as placing restorations, Orthodontics, Endodontics, Radiography, surgical, Prosthodontics, and Periodontal specialty skills and procedures. Students may be eligible to participate in an off-campus **externship experience** in a local dental office during second semester.

T56632 Dental Careers III (5204)

Open to grade 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Required Prerequisite(s): T56612 Dental Careers I, AND T56622 Dental Careers II

Dual Credit Available

Upon successful completion of the first two years of Dental Careers, students may be eligible to participate in this course that advances their skills through a community placement and specialized skill training. Students have the opportunity to acquire a provisional radiology permit, allowing them to perform limited radiologic procedures. Clinical placement begins early in the school year and continues until the end of the year. This is a wonderful opportunity for students to gain in-depth exposure to the dental field and solidify a strong foundation for transitioning into post-secondary programs or career placement.

T56712 Health Science Education

I: Nursing (5282)

Open to grades 10, 11, 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Recommendation(s): T56101 PLTW Principles of the Biomedical Sciences, OR T56201 PLTW Human Body Systems Dual Credit Available

This course provides entry-level training in nursing assisting and introduction to medical assisting. At the completion of this course, students may receive certification as a Certified Nursing Assistant (CNA) through the Indiana State Department of Health. Students may receive certification in CPR/AED for the Professional Rescuer. During the school year, students learn hands-on skills in the classroom and simulated laboratory. These skills include infection control measures, patient hygiene, nutrition, vital signs, patient movement, etc. Following training on the skills mentioned above, students receive clinical (on-the-job) experience in nursing or continue in the classroom for introduction to medical assisting. Clinical placement is designed to allow the student to gain clinical experience towards the 75 hours required for the state CNA exam. Following the first year of introduction to medical assisting, the student is given the opportunity to continue to nursing year II. The student will then complete the required skills to have the opportunity to study for the certification exam to become a medical assistant. The first year of the nursing program provides a wide range of entry-level health care skills that gives students a solid foundation for transitioning into post-secondary programs or career placement.

T56722 Health Science Education

II: Nursing (5284)

Open to grades 11, 12

2 semesters, 2 credits per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Required Prerequisite(s): T56712 Health Science Education I: Nursing

This course offers an overview of human anatomy, physiology, disease process, and treatment with an emphasis on healthcare employability skills, teamwork, and communication.

Students have an opportunity to learn advanced skills and explore a variety of nursing and allied health careers. Through a combination of course work and clinical (on-the-job) experience closely related to the area of their interest(s), students are given the opportunity to test to become an NHA Certified Clinical Medical Assistant (CCMA). Clinical placement begins early in the school year and continues through the end of the year. Nursing II offers a wonderful opportunity for students to create custom training (on-the-job), unique to their specific interests, while enhancing their foundation for advanced employment and/or post-secondary education in the health career fields.

T56732 Health Science Education III: Nursing (5284)

Open to grade 12

2 semesters, 3 credits per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Required Prerequisite(s): T56722 Health Science Education II: Nursing

Upon successful completion of the first two years of Nursing, students may be eligible to participate in this course, which advances their skills through a community placement and specialized skill training. Clinical placement begins early in the school year and continues until the end of the year. This is a wonderful opportunity for students to gain in-depth exposure to the nursing field and solidify a strong foundation for transitioning into post-secondary programs or career placement.

T56512 Veterinary Careers I (5211)

Open to grades 10, 11, 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Recommendation(s): T50061 Animal Science, OR T25501 Advanced Life Science: Animals, OR T56101 PLTW Principles of the Biomedical Sciences, OR T56201 PLTW Human Body Systems, OR T56211 Medical Terminology

This course provides entry level training as a Veterinary Assistant for students pursuing careers as Veterinarians, Veterinary Technicians, or other careers involving animals. The focus of the first semester is classroom and laboratory training. The student will have the opportunity to practice assisting with the physical exam, veterinary nursing care, animal restraint, and assisting with surgical procedures. Second semester students will have the opportunity to receive clinical (on-the-job) training within the professional community. Clinical training placements are at off-campus locations that may include veterinary offices, animal shelters, humane societies, groomers, and animal behavior and training facilities. Students have the opportunity to receive certification in CPR/AED for the Professional Rescuer.

T56522 Veterinary Careers II (5212)

Open to grades 11, 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

Required Prerequisite(s): T56512 Veterinary Careers I

This course curriculum offers medical office training. Students also have the opportunity to advance learning in the veterinary field through clinical (on-the-job) training, depending on instructor approval. Clinical placement begins early in the school year and continues until the end of the year. This course offers a excellent opportunity for students to gain in-depth exposure to

their potential health career as well as providing a solid foundation for employment and college/technical education.

**T56532 Veterinary Careers III
(5212)**

Open to grade 12

2 semesters, 2 credit hours per semester

Approximate cost per semester: TBD

Meets requirements of: THD, AHD, Core 40

**Required Prerequisite(s): T56522
Veterinary Careers II**

Upon successful completion of the first two years of veterinary careers, students may be eligible to participate in this course that advances their skills through a community placement and specialized skill training.

Clinical placement begins early in the school year and continues until the end of the year. This is a wonderful opportunity for students to gain in-depth exposure to the veterinary field and solidify a strong foundation for transitioning into post-secondary programs or career placement.