



2025-2026

PROJECT LEAD THE WAY: MEDICAL INTERVENTIONS

Teacher Name: Mrs. Katie Collins

Teacher E-mail: kmcollins@madisoncity.k12.al.us

Course Description:

In the Medical Interventions course, students will investigate the variety of interventions involved in the prevention, diagnosis, and treatment of disease as they follow the lives of a fictitious family. A “How-To” manual for maintaining overall health and homeostasis in the body, the course will explore how to prevent and fight infection, how to screen and evaluate the code in our DNA, how to prevent, diagnose, and treat cancer, and how to prevail when the organs of the body begin to fail. Through these scenarios, students will be exposed to a wide range of interventions related to Immunology, Surgery, Genetics, Pharmacology, Medical Devices, and Diagnostics.

Course Objectives:

Students will:

- 1) Students will utilize concepts learned in the previous biomedical courses as they seek medical interventions for the family case scenarios.
- 2) Students will research various types of medical interventions from simple diagnostic tests to the treatment of complex diseases and disorders.
- 3) Students will explore the role of lifestyle choices and preventive measures as well as scientific thinking and engineering design, as they examine all medical interventions in healthcare.

Classroom Expectations:

You are expected to conduct yourself respectfully and productively. In addition to all the rules and expectations listed in the student handbook, I expect you to have a positive attitude, treat others with respect, practice self-discipline, and demonstrate responsibility. If these conditions are not met, you can expect one-on-one meetings with me, parent/instructor conferencing, and administrative action, if necessary.

Cell Phone Expectations

ALL electronic devices are prohibited from being used during the instructional day. This is from 8:12-3:28. This includes: cell phones, smart watches, earbuds/headphones/airpods, tablets, and personal computers (school issues laptops will be allowed). Discipline will be given to ANY student who uses an electronic device. If you bring your device to school, it MUST be placed in your bookbag. It cannot be on your person.

Tardy Policy

Students late to ANY class, without a pass, will report to a tardy scanning station. You will input your identification number on the pin pad. A tardy slip will be printed for you to report to class. Parent email will be sent for every tardy. Discipline will be as follows: 3 total tardies will result in 1 day of ISS; 6 total tardies will result in 2 days of ISS; Progressive discipline to follow.

Grading Policy:

Grades are based on a 100 point scale. We have two types of grades: daily grades (30% of final grade) and tests (70% of final grade). The percentage based grading scale is as follows: A (90-100), B (80-89), C (70-79), D (65-69), and F (below 65). Grades will be a reflection of mastery of the standards. Make sure all absences are excused as class work can be made up and graded for excused absences only.



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Cheating/plagiarizing will be handled by the teacher at teacher discretion.

Exam Exemption Policy

Any student in grades 9-12 are eligible to earn an exam exemption for the 2025-2026 Exams for each class IF they have earned an 85% or higher as the final grade for that course. Any of the following will **EXCLUDE** a student from exempting for that class:

- **More than five EXCUSED absences**
- **Any UNEXCUSED absence**
- **In School Suspension (ISS) for 3 days or more**
- **Out of School Suspension (OSS)**
- **One or more days of Alternative School placement**
- **Not participating in the state standardized assessment for their grade level (10th PreACT, 11th ACT with Writing, 12th WorkKeys, and AP exams)**

Attendance and full participation in reviews and assignments for the class leading up to the day of the final exam are required.

Make-up Work Policy:

Attendance is crucial for success in MI as most of the work will be done in class and many of the activities are difficult to make up.

It is the **student's** responsibility to collect assignments that are missed during an absence from Schoology, another student, or by contacting the teacher. **Students have the same number of days they were absent to make up an assignment/activity.** Note: Certain lab activities cannot be made up due to logistical issues, and students will be given a possible alternate assignment to replace the lab grade.

Tests & quizzes that are missed will be completed outside of instructional/activity time. Please talk to me to set up a time to make up your assignment during Patriot Prep. It is the **student's** responsibility to set up a time and make up your test or quiz.

***Text and Other
Required Reading:***

There is no textbook for this course. The course is online and the majority of the materials that accompany this class will be accessible online.



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Embedded Numeracy and Literacy

Opportunities for numeracy and literacy in the CTE class are critical and help support the goals of CTE in preparing students for college and/or career. Example anchor activities for mathematics include performing various calculations such as serial dilutions and Beer's Law; analyzing data collected from laboratory application and research. Example anchor activities for literacy include: Reading scientific articles, interviewing various medical professionals, investigating various STEM fields and describing their responsibilities and the requirements to enter the field, writing a design brief or other science laboratory report.

Technical Writing

Students will learn to select and use appropriate language and layout for technical documents and write documents that are clear, accurate, and grammatically correct.

CTSO: Students are encouraged to participate in HOSA. Competitive events that relate to a specific topic discussed in class will be highlighted.

18 - WEEK PLAN*

WEEK 1

Introduction

Unit One: How to Fight Infection (22.5 Days)

Essential Question:

How do scientists identify and treat infectious diseases to protect individuals and communities?

Lesson 1.1: The Mystery Infection (8.5 Days)

Activity 1.1.1 - Medical Interventions Inventory

Activity 1.1.2 - Investigating an Outbreak

Problem 1.1.3 - Using DNA to Identify Pathogens

Activity 1.1.4 - What's the Concentration? (**Optional**, additional 1.5 days)

Activity 1.1.5 – ELISA

Activity 1.1.6 - Final Diagnosis

WEEK 2

WEEK 3

Lesson 1.2: Antibiotic Treatment (4.5 Days)

Activity 1.2.1 - Antibiotic Therapy

Activity 1.2.2 – Which Antibiotic is the Best Choice?

Project 1.2.3 - Attack of the Superbugs

Activity 1.2.4 - When Antibiotics Fail



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WEEK 4

Lesson 1.3: The Aftermath: Hearing Loss (5 Days)

Activity 1.3.1 - Good Vibrations

Activity 1.3.2 - Can You Hear Me Now?

Activity 1.3.3 - Cochlear Implant Debate

WEEK 5

Lesson 1.4: Vaccination (4.5 Days)

Activity 1.4.1 - Disease Prevention Through Vaccination

Activity 1.4.2 - Vaccine Development

Activity 1.4.3 - Life of An Epidemiologist

WEEK 6

Unit 2: How to Screen What Is In Your Genes (11.5 Days)

Essential Question:

How does genetic testing influence decision-making for individuals and families?

Lesson 2.1: Genetic Testing and Screening (8 Days)

Activity 2.1.1 - Chronicles of a Genetic Counselor

Activity 2.1.2 - Copy Your Genes

Activity 2.1.3 - Test Your Own Genes

Activity 2.1.5 - Maternal and Child Health

WEEK 7

Lesson 2.2: Our Genetic Future (3.5 Days)

Activity 2.2.1 - Gene Therapy

Activity 2.2.2 - Reproductive Technology

WEEK 8

Unit 3: How to Conquer Cancer (29 Days)

Essential Question:

How can early detection, personalized treatment, and technology improve cancer outcomes?

Lesson 3.1: Detecting Cancer (7.5 Days)

Activity 3.1.1 - Who is Affected by Cancer?

Activity 3.1.2 - Diagnostic Imaging Career Activity

Activity 3.1.3 - When Cells Lose Control

Activity 3.1.4 - DNA Microarray

Activity 3.1.5 - Unlocking the Secrets in Our Genes

WEEK 9

Lesson 3.2: Reducing Cancer Risk (8.5 Days)

Activity 3.2.1 - Am I at Risk?

Project 3.2.2 - Skin Cancer Prevention

Activity 3.2.3 - Breast Cancer Screening & Prevention



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WEEK 10

Activity 3.2.4 - Virology Career Activity
Activity 3.2.5 - Routine Screenings

Lesson 3.3: Treating Cancer (6 Days)

Activity 3.3.1 - Diary of a Cancer Patient
Project 3.3.2 - Biofeedback Therapy with EKG
Project 3.3.2 – Biofeedback Therapy with Hand Grip Monitors (Alternative for Project 3.3.3)
Biofeedback Therapy with EKG)

WEEK 11

Project 3.3.3 - Design of a Prosthetic Arm
Project 3.3.4 - Occupational and Physical Therapy Careers

Lesson 3.4: Building a Better Cancer Treatment (7 Days)

WEEK 12

Activity 3.4.1 - Personalized Medicine
Activity 3.4.2 – Nanofuture
Activity 3.4.3 - Clinical Trials
Project 3.4.4 - Tiny Treatment

WEEK 13

Unit Four: How to Prevail When Organs Fail (24.5 Days)

Essential Question:

How can biomedical innovations restore or replace failing organs and systems in the human body?

Lesson 4.1: Manufacturing Human Proteins (10 Days)

WEEK 14

Activity 4.1.1 - All About Insulin
Activity 4.1.2 - Protein Factories
Activity 4.1.3 - Protein Purification
Activity 4.1.4 - Protein Gel Electrophoresis
Activity 4.1.5 - Careers in Biomanufacturing

WEEK 15

Lesson 4.2: Organ Failure (1.5 Days)

Activity 4.2.1 - Medical Detectives

Lesson 4.3: Transplant (7.5 Days)

WEEK 16

Activity 4.3.1 - Who Should Receive the Organ?
Activity 4.3.2 - Finding a Match
Activity 4.3.3 - Kidney Donation
Activity 4.3.4 - You Be the Surgeon
Activity 4.3.5 - Transplant Team
Activity 4.3.6 - Are All Transplants the Same?

WEEK 17

Lesson 4.4: Building a Better Body (5.5 Days)

Activity 4.4.1 - Replacement Parts
Problem 4.4.2 - The Bionic Human



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WEEK 18

Activity 4.4.3 – Putting it all Together

Review for **Semester Exam** and **End of Course Test** for PLTW

Review for BACE

***This is a tentative plan and may change at the discretion of the teacher.**

I look forward to having a great year! I feel fortunate to have your son/daughter in my class this semester and hope that you will contact me should you have any concerns about the progress of your son/daughter or any aspect of the instruction. With your son/daughter, please read the attached policies, then sign and date this signature page and have your son/daughter submit this on Schoology or print off and return to school. Please provide a current email address and phone number at which I can contact you should the need arise. Please contact me at school via my email with any concerns.

Game On!

Please sign/complete below to acknowledge that you have received, read, and understood the syllabus.

Student Name:	Parent Name:
Student Signature:	Parent Signature: