



The following information is subject to change. As with all course materials, we will continue to update as more information becomes available.

PLTW Standards Alignment

Our programs are designed to empower students to thrive in an evolving world. As a part of this, we take standards alignment into account when developing and updating our curriculum. We define alignment as:

- Students complete a designated task(s) that demonstrates the outlined knowledge and/or skills of the specific standard or objective.
- Our multidisciplinary programs align to a variety of standards and provide districts and schools with the flexibility to tailor programs to meet their specific state or local requirements as needed.
- All PLTW pathways align to Common Core State Standards for Mathematics and English Language Arts and Next Generation Science Standards. Additionally, our computer science pathway aligns to Computer Science Teachers Association Standards.

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Common Core State Standards for English Language Arts Anchor Standards

Reading

- AS.R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- AS.R.7 Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
- AS.R.8 Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

Writing

- AS.W.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
- AS.W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- AS.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- AS.W.6 Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
- AS.W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
- AS.W.8 Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
- AS.W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking and Listening

- AS.SL.1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- AS.SL.1 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- AS.SL.3 Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.



Common Core State Standards for English Language Arts Anchor Standards

AS.SL.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Language

AS.L.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.6 Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.



Standards for Technological Literacy

Students will develop an understanding of the characteristics and scope of technology.

- 1.6-8.F New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology.
- 1.6-8.G The development of technology is a human activity and is the result of individual and collective needs and the ability to be creative.
- 1.6-8.H Technology is closely linked to creativity, which has resulted in innovation.
- 1.6-8.M Technologies systems include input, processes, output, and at times, feedback.
- 1.6-8.N Systems thinking involves considering how every part relates to others.

Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

- 3.6-8.F Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.

Students will develop an understanding of the cultural, social, economic, and political effects of technology.

- 4.6-8.D The use of technology affects humans in various ways, including their safety, comfort, choices, and attitudes about technology's development and use.
- 4.6-8.E Technology, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences.
- 4.6-8.F The development and use of technology poses ethical issues.
- 6.6-8.D Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.



National Consortium for Health Science Education

Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles

- 1.1.1 a Identify basic levels of organization of the human body
 - a. Chemical
 - b. Cellular
 - c. Tissue
 - d. Organs
 - e. Systems
 - f. Organism

- 1.1.2 f Respiratory
 - Structures of the respiratory system
 - Identify respiratory organs
 - Functions of the respiratory system
 - Gas exchange

- 1.2.1 Describe etiology, pathology, diagnosis, treatment, and prevention of common diseases and disorders, including, but not limited to the following:
 - Arthritis
 - Asthma
 - Cancer
 - Cataracts
 - Concussion / Traumatic Brain Injury (TBI)
 - Cystic Fibrosis
 - Diabetes Mellitus
 - Dementia
 - Gastric Ulcer
 - Hepatitis
 - Hypertension
 - Melanoma
 - Muscular Distrophy
 - Myocardial Infarction
 - Sexually Transmitted Infection (STI)
 - Stroke / Cardiovascular Accident (CVA)
 - Tuberculosis
 - Urinary Tract Infection (UTI)

- 1.3.2 Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.



National Consortium for Health Science Education

Foundation Standard 2: Communications: demonstrate methods of delivering and obtaining information, while communicating effectively.

- 2.1.1 Model verbal and nonverbal therapeutic communication.
 - Active listening
 - Silence
 - Summarizing
 - Reflecting
- 2.1.2 b Psychological barriers
 - Attitudes
 - Bias
 - Prejudice
 - Stereotyping
- 2.1.3 Distinguish between subjective and objective information.
- 2.1.4 Interpret elements of communication using sender-message-receiver feedback model.
- 2.1.5 Modify communication to meet the needs of the patient/client and be appropriate to the situation.
- 2.2.1 Use common roots, prefixes, and suffixes to communicate information.
- 2.2.2 Interpret common medical abbreviations to communicate information.
- 2.3.1 Use proper elements of written and electronic communication (spelling, grammar, and formatting).
- 2.3.2 Prepare examples of technical and informative writing.
- 2.3.3 Demonstrate appropriate use of digital communication in a work environment, such as email, text, and social media.

Foundation Standard 3: Systems: Identify how key systems affect services performed and quality of care.

- 3.1.1 c Government
 - Veterans Administration (VA)
 - Centers for Disease Control and Prevention (CDC)
 - Food and Drug Administration (FDA)
 - Occupational Safety and Health Administration (OSHA)
 - Public Health Service (PHS)
- 3.1.1. d Related organizations
 - American Cancer Society
 - American Heart Association (AHA)
 - American Red Cross (ARC)
 - March of Dimes
 - World Health Organization (WHO)



National Consortium for Health Science Education

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- 3.1.2 Examine the healthcare consumer's rights and responsibilities within the healthcare system.
 - Self-advocacy
 - Compliance
 - Patient's Bill of Rights

- 3.1.3 Analyze the impact of emerging issues on healthcare delivery systems.
 - Addictions
 - Bioethics
 - Epidemiology
 - Socioeconomics
 - Technology

Foundation Standard 4: Employability Skills: Use employability skills to enhance employment opportunities and job satisfaction.

- 4.1.1 Identify personal traits and attitudes desirable in a career ready member of a health team.
 - Acceptance of criticism
 - Competence
 - Dependability
 - Discretion
 - Empathy
 - Enthusiasm
 - Honesty
 - Initiative
 - Integrity
 - Patience
 - Positive attitude
 - Responsibility
 - Self-motivation
 - Tact
 - Team player
 - Willingness to learn



National Consortium for Health Science Education

- 4.2.1 Apply employability skills in healthcare.
 - Chain of command
 - Communication skills
 - Decision making
 - Flexibility
 - Organization
 - Problem solving
 - Scope of practice
 - Time management
 - Work ethic

- 4.3.1 Research levels of education, credentialing requirements, and employable trends in health professions.

- 4.3.2 Distinguish differences among careers within a health science pathway.
 - Biotechnology research and development
 - Diagnostic services
 - Health informatics
 - Support Services
 - Therapeutic services

Foundation Standard 5: Legal Responsibilities: Describe legal responsibilities, limitations, and implications on healthcare worker actions

- 5.2.1 Apply standards for the safety, privacy and confidentiality of health information.
 - HIPAA
 - Privileged communication

Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

- 6.1.1 Differentiate between ethical and legal issues impacting healthcare.

- 6.1.2 Identify ethical issues and their implications related to healthcare.
 - Ethics committee
 - Euthanasia
 - In-vitro fertilization
 - Organ donation
 - Scope of practice

- 6.2.1 Discuss religious and cultural values as they impact healthcare.
 - Ethnicity
 - Gender
 - Race
 - Religion



National Consortium for Health Science Education

- 6.2.2 Demonstrate respectful and empathetic treatment of ALL patients/clients.
- Civility
 - Customer service
 - Patient Satisfaciton

Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

- 7.1.1a Identify classifications of pathogens
- Bacteria
 - Fungi
 - Parasites
 - Protozoa
 - Viruses
- 7.1.1b Describe characteristics of microorganisms.
- Aerobic
 - Anaerobic
 - Non-pathogenic
 - Pathogenic
- 7.1.1c Describe mode of transmission
- Common vehicle (air, food, water)
 - Direct
 - Healthcare-associated infections (nosocomial)
 - Indirect
 - Opportunistic
 - Vectors
- 7.1.2a Asepsis
- Sanitization
 - Antisepsis
 - Disinfection
 - Sterile technique
 - Sterilization
- 7.1.2b Standard precautions
- Handwashing
 - Gloving
 - Personal Protective Equipment (PPE)
 - Environmental cleaning
- 7.1.2c Isolation
- Transmission-based contact
- 7.1.2e Vaccinations



National Consortium for Health Science Education

Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

- 8.1.1 Evaluate roles and responsibilities of healthcare team members.
- 8.1.2 Identify characteristics of effective teams.
 - Defined roles
 - Common purpose
 - Effective communication
 - Effective leadership
 - Measurable processes and outcomes
 - Mutual respect
 - Shared goals
- 8.2.1 Recognize methods for building positive team relationships.
- 8.2.2a Characteristics
 - Focused and driven
 - Interpersonal skills
 - Motivates and inspires
 - Organized and balanced
- 8.2.2b Types
 - Autocratic
 - Democratic
 - Laissez faire
- 8.2.2c Roles
 - Communicates vision
 - Leads change
 - Manages accountability
- 8.2.3 Apply effective techniques for managing team conflict.
 - Communicate assertively
 - Set clear expectations
 - Gather the facts
 - Mediate disputes
 - Negotiate resolutions
- 8.2.4 Evaluate why teamwork is an important part of healthcare and how it improves patient care.



National Consortium for Health Science Education

Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

- 9.1.3 Describe strategies for prevention of disease.
- Community health education outreach program
 - Immunizations
 - Medical, dental, and mental health screenings
 - Routine physical exams
 - Stress management

Foundation Standard 10: Technical Skills: Apply and demonstrate technical skills and knowledge common to health career specialties.

- 10.1.1 Demonstrate procedures for measuring and recording vital signs including the normal ranges.
- blood pressure
 - temperature
 - Oxygen saturation
 - Pain
 - Pulse
 - Respirations



Common Core State Standards for Mathematics

Quantities

N.Q.2 Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Linear, Quadratic, and Exponential Models

F.LE.1.b Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

Making Inferences and Justifying Conclusions

S.IC.6 Evaluate reports based on data.

Using Probability to Make Decisions

S.MD.7 (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).



Next Generation Science Standards

Ecosystems: Interactions, Energy, and Dynamics

- HS.LS2.8 Evaluate the evidence for the role of group behavior on an individual's and species' chances to survive and reproduce.

Engineering Design

- HS.ETS1.1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- HS.ETS1.2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- HS.ETS1.3 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
- HS.ETS1.4 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

Engineering Design - Developing Possible Solutions

- DCI - ETS1.B When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (HSETS1-3)

Asking questions and defining problems

- Science and Engineering Practice Ask Questions - that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information and relationships. - to determine relationships, including quantitative relationships, between independent and dependent variables. - to clarify and refine a model, an explanation, or an engineering problem.
- Science and Engineering Practice Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the sustainability of a design.
- Science and Engineering Practice Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.



Next Generation Science Standards

Developing and Using Models

Science and Engineering Practice	Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria.
Science and Engineering Practice	Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.
Science and Engineering Practice	Develop and/or use a model (including mathematical or computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Analyzing and Interpreting Data

Science and Engineering Practice	Analyze data using tools, technologies, and/or models (e.g. computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.
Science and Engineering Practice	Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.
Science and Engineering Practice	Analyze data to identify design features or characteristics of the components of a proposed process or system to optimize it relative to criteria for success.

Using Mathematics and Computational Thinking

Science and Engineering Practice	Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.
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Constructing Explanation and Designing Solutions

Science and Engineering Practice	Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.
Science and Engineering Practice	Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to practice which the reasoning and data support the explanation or conclusion.
Science and Engineering Practice	Design, evaluate, and/or refine a solution to complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.



Engaging in Argument from Evidence

Science and Engineering Practice	Compare and evaluate competing arguments or design solutions in light of currently accepted explanations, new evidence, limitations (e.g., trade-offs), constraints, and ethical issues.
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Next Generation Science Standards

Science and Engineering Practice	Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.
Science and Engineering Practice	Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Obtaining, Evaluating, and Communicating Information

Science and Engineering Practice	Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.
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Cause and Effect: Mechanism and Prediction

Crosscutting Concepts	Events have causes, sometimes simple, sometimes multifaceted. Deciphering casual relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.
Crosscutting Concepts	Cause and effect relationships can be suggested and predicted for complex natural and designed systems by examining what is known about smaller scale mechanisms within the system.

Scale, Proportion, and Quantity

Crosscutting Concepts	The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.
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Systems and System Models

Crosscutting Concepts	A system is an organized group of related objects or components; models can be used understanding and predicting the behavior of systems.
Crosscutting Concepts	Models (e.g., physical, mathematical, computer models) can be used to simulate systems interactions—including energy, matter, and information flows—within and between systems at different scales.



Crosscutting Concepts Models can be used to predict the behavior of a system, but these predictions have precision and reliability due to the assumptions and approximations inherent in models.

Structure and Function

Crosscutting Concepts Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.

Stability and Change

Crosscutting Concepts For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts Much of science deals with constructing explanations of how things change and how they remain stable.