

Medical Interventions Curriculum

This curricula and accompanying instructional materials have been developed to align with the NJSLS and in accordance with the NJ Department of Education's guidelines to include: Curriculum designed to meet grade level expectations, integrated accommodations and modifications for students with IEPs, 504s, ELLs, and gifted and talented students, assessments including benchmarks, formative, summative, and alternative assessments, a list of core instructional and supplemental materials, pacing guide, interdisciplinary connections, integration of 21st century skills, integration of technology, and integration of 21st Century Life and Career standards.

About the Standards

In 1996, the New Jersey State Board of Education adopted the state's first set of academic standards called the Core Curriculum Content Standards. The standards described what students should know and be able to do upon completion of a thirteen-year public school education. Over the last twenty years, New Jersey's academic standards have laid the foundation for local district curricula that is used by teachers in their daily lesson plans.

Revised every five years, the standards provide local school districts with clear and specific benchmarks for student achievement in nine content areas. Developed and reviewed by panels of teachers, administrators, parents, students, and representatives from higher education, business, and the community, the standards are influenced by national standards, research-based practice, and student needs. The standards define a "Thorough and Efficient Education" as guaranteed in 1875 by the New Jersey Constitution. Currently the standards are designed to prepare our students for college and careers by emphasizing high-level skills needed for tomorrow's world.

The New Jersey Student Learning Standards include Preschool Teaching and Learning Standards, as well as nine K-12 standards for the following content areas: **21st Century Life and Careers, Comprehensive Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, World Languages**

Lower Cape May Regional School District Medical Interventions Curriculum	
Content Area: Science	
Course Title: Medical Interventions	Grade level: 11-12
Unit 1: How to Fight Infection	Dates for Units: September
Unit 2: How to Screen What is in Your Genes	Dates for Units: Oct- Nov
Unit 3: How to Conquer Cancer	Dates for Units: Dec- Jan
Unit 4: How To Prevail When Organs Fail	Dates for Units: Feb- May
Date Created: As adopted from PLTW 2018	Board Approved On:

Lower Cape May Regional School District Medical Interventions Curriculum Unit 1 Overview
Content Area: Science
Unit Title: How to Fight Infection
Target Course/Grade Level: Grades 11-12
<p>Unit Summary: In this unit students are introduced to Sue Smith, the eighteen-year-old daughter of Mr. and Mrs. Smith. Sue is a college freshman who is presenting symptoms of an unknown infectious disease which students eventually identify as bacterial meningitis. Sue survives the infection but is left with hearing impairment. Through this case students will explore the diagnostic process used to identify an unknown infection, the</p>

use of antibiotics as a treatment, how bacteria develop antibiotic resistance, how hearing impairment is assessed and treated, and how vaccinations are developed and used to prevent infection.

Identity Lesson Summary

Lesson 1.1 The Mystery Infection

Lesson 1.2 Antibiotic Treatment

Lesson 1.3 The Aftermath – Hearing Loss

Lesson 1.4 Vaccination

Interdisciplinary Connections:

R.1 - Reading

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.

R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

21st Century Themes, Skills, and Standards:

- 9.2.12.CAP.2: Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
- 9.2.12.CAP.3: Investigate how continuing education contributes to one's career and personal growth.
- 9.2.12.CAP.4: Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
- 9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans.
- 9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HS-LS1-2	Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
HS-LS1-1	All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells
HS-LS1-3	Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.
HS-LS1-4, HS-LS1-5, HS-LS1-7	Use a model based on evidence to illustrate the relationships between systems or between components of a system
HS-LS1-3	Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.
HS-LS1-1	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> ● How can we detect and fight an outbreak? ● How can we analyze clues to determine a diagnosis? ● What is ELISA? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> ● DNA sequence analysis ● What are the role of pathogens? ● How can we stop an outbreak?

<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● Enzyme linked Immunosorbent Assay (ELISA) ● What is anti-biotic treatment ● The physics of sound and how it can affect hearing loss 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Explore genetic databases ● Outline a plan to stop a potential outbreak ● Discuss interventions such as antibody therapy and vaccination
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<p>Lower Cape May Regional School District Medical Interventions Curriculum Unit 2 Overview</p>
<p>Content Area: Science</p>
<p>Unit Title: How to Screen What is in Your Genes</p>
<p>Target Course/Grade Level: Grades 11-12</p>
<p>Unit Summary: In this unit students are introduced to Mr. and Mrs. Smith, Sue's parents. Mr. and Mrs. Smith are very excited to find out they are expecting a new baby. Because the couple is in their early 40s, the doctor has suggested genetic screening and testing. Through this case students will explore how to screen and evaluate the code in our DNA, the value of good prenatal care, and the future of genetic technology. The goal of this lesson is for students to examine the available types of genetic testing and screening and discuss ethical implications of these tests. Assuming the role of genetic counselors, students will analyze a patient case concerning issues of genetic testing and provide appropriate recommendations. Next, students will explore molecular techniques necessary to complete a genetic test. They will use the tools of molecular biology to extract their own DNA, amplify a part of the gene for bitter-tasting ability, identify their own gene sequence by restriction digest, and view their resultant genotype using gel electrophoresis. Students then have a chance to test their own phenotype and see how well this genotype predicts their own ability. Finally students will investigate the interventions that exist to help protect and monitor a growing fetus.</p>

Interdisciplinary Connections:

R.1 - Reading

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.

R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

21st Century Themes, Skills, and Standards:

- 9.2.12.CAP.7: Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
- 9.2.12.CAP.8: Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, drug tests) used by employers in various industry sectors.
- 9.2.12.CAP.9: Locate information on working papers, what is required to obtain them, and who must sign them.
- 9.2.12.CAP.10: Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HS-LS1-1	All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells
HS-LS1-3	Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.
HS-LS1-4, HS-LS1-5, HS-LS1-7	Use a model based on evidence to illustrate the relationships between systems or between components of a system
HS-LS1-3	Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.
HS-LS1-1	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> • What is genetic testing and why do people do it? • What can our genes tell us? • What is gene therapy? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Why would a patient request genetic testing? • How can we identify gene sequence? • What is restriction digest? • What is gel electrophoresis?
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> • What is osteosarcoma • What is remission 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> • Explore their own genes by extracting DNA for bitter-tasting ability

<ul style="list-style-type: none"> • How to explore the diagnostic process • Determine the presence of cancerous cells 	<ul style="list-style-type: none"> • Test their own phenotype
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<p>Lower Cape May Regional School District Medical Interventions Curriculum Unit 3 Overview</p>
<p>Content Area: Science</p>
<p>Unit Title: How to Conquer Cancer</p>
<p>Target Course/Grade Level: 11-12</p>
<p>Unit Summary:</p> <p>Unit 3: How to conquer Cancer</p> <p>In this unit students are introduced to Mike Smith, the sixteen-year-old son of Mr. and Mrs. Smith. Mike is diagnosed with osteosarcoma, a type of bone cancer that often affects teenagers. Mike’s treatments put him into remission; however, in order to remove all of the cancerous tissue, he had to have most of his arm amputated. Mike now needs a prosthesis. Through this case students will explore the diagnostic process used to determine the presence of cancerous cells, the risk factors and prevention of cancer, rehabilitation after disease or injury, and the design process for new medications, prosthetics, and nanotechnology</p>
<p>Interdisciplinary Connections:</p> <p>R.1 - Reading 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.</p> <p>R.2 - Reading Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</p> <p>W.1 - Writing Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</p>

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others

21st Century Themes, Skills, and Standards:

- 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12.prof.CR3a).
- 9.4.12.CI.2: Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12.prof.CR2b, 2.2.12.LF.8).
- 9.4.12.CI.3: Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HS.LS1.7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
HS-LS1-2	Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
HS-LS1-1	All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells
HS-LS1-3	Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.
HS-LS1-4, HS-LS1-5, HS-LS1-7	Use a model based on evidence to illustrate the relationships between systems or between components of a system

<p>HS-LS1-3</p>	<p>Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.</p>
<p>HS-LS1-1</p>	<p>Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.</p>
<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> • How does genetics affect treatment? • What is amputation? • What is rehabilitation? • What new medications exist? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • What are cancer risk factors • How can we prevent cancer • Diagnostic imaging • Cancer cells vs normal cells
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> • About detecting cancer • About prosthetics • The role that treatments play 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> • Understand preventative methods to avoid cancer • Better understand genetics • Understand mutations caused by UV light • Inherited mutations vs mutations by virus

**Lower Cape May Regional School District Medical Interventions Curriculum
Unit 4 Overview****Content Area: Science****Unit Title: How to Prevail when Organs Fail****Target Course/Grade Level: Grades 11-12****Unit Summary:****Unit 4: How to Prevail When Organs Fail**

In this unit students are introduced to Mrs. Jones, the forty-four-year-old sister of Mrs. Smith. Mrs. Jones has been struggling with Type 1 Diabetes for twenty years. Over the years, Mrs. Jones did not take good care of herself or properly control her diabetes. She eventually began using an insulin pump and changed her lifestyle to regulate her blood sugar levels, but the damage had already been done. Mrs. Jones is now dealing with end stage renal failure and needs a kidney transplant. Through this case students will explore protein production, blood sugar regulation, dialysis, organ donation and transplantation, and non-invasive surgery techniques. In addition students will create a bionic human.

The goal of this lesson is for students to investigate the biomanufacturing of human proteins used for medical interventions. They will first use the process of bacterial transformation to insert a plasmid containing the gene for green fluorescent protein (GFP) into *E. coli* cells. Students will then use chromatography to separate the GFP protein from the other proteins in the bacterial cells. They will collect proteins in differential fractions and analyze the contents of these fractions using gel electrophoresis. Students will relate their molecular work to the case of Diana Jones, who is a Type 1 diabetic on insulin therapy. Without insulin produced by the biomanufacturing process explored in this lesson, she would have died long ago. As the unit progresses, students will research and design other medical interventions that will help Diana in her battle with diabetes and renal failure.

Interdisciplinary Connections:**R.1 - Reading**

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.

R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
 AS.W.6 - Writing
 Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others

21st Century Themes, Skills, and Standards:

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
HS.LS1.2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
HS-LS1-2	Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
HS-LS1-1	All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells
HS-LS1-3	Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.
HS-LS1-4, HS-LS1-5, HS-LS1-7	Use a model based on evidence to illustrate the relationships between systems or between components of a system
HS-LS1-3	Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.
HS-LS1-1	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that

	describe the natural world operate today as they did in the past and will continue to do so in the future.
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.
<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> ● How can we manufacture human proteins? ● What is organ failure? ● What is a transplant? ● What is GFP? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> ● Protein production ● Purpose of an Insulin pump ● Blood sugar regulation
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● About insulin therapy ● About dialysis ● Non-invasive surgery techniques ● How to create a bionic human 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Investigate symptoms to determine issue ● Run diagnostic tests ● Analyze data

Specific Formative Assessments Utilized in Daily Lessons:

- Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.
- 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.

Summative Assessment Utilized throughout Units:

- Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
- Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Modifications for ELL's, Special Education, 504, and Gifted and Talented Students:

- Teacher tutoring
- Peer tutoring
- Cooperative Learning Groups
- Modified Assignments
- Differentiated Instruction
- Response to Intervention (www.help4teachers.com)
- Follow all IEP and 504 modifications
- ADD TO LIST AS YOU SEE NECESSARY

Teacher Notes:

- As required by the NJ Department of Education, teachers in all content areas will integrate the 21st Century Life and Careers Standards. As the NJDOE indicates, "Providing New Jersey students with the life and career skills needed to function optimally within this dynamic context is a critical focus and organizing principle of K-12 public education. New Jersey has both an obligation to prepare its young people to thrive in this environment, and a vested economic interest in grooming an engaged citizenry made up of productive members of a global workforce that rewards innovation, creativity, and adaptation to change." The links below indicate the CPIs for grade ranges and need to be addressed throughout the units of study:
[Life and Career Standards](#)
- As indicated in the NJSLS, standards and interdisciplinary connections will be integrated throughout content area curriculum.

Project-based Learning Tasks:

- Asper PLTW web-based site

Vocabulary:

- In-text vocabulary should be incorporated into every unit. Word journals, vocabulary walls, and/or various other activities should be utilized by the instructor to teach vocabulary.

The Research Process:

- The research process must be integrated within each course curriculum. Student will be provided with opportunities to investigate issues from thematic units of study. As the NJSLS indicate, students will develop proficiency with MLA or APA format as applicable.

Technology:

- Students must engage in technology applications integrated throughout the curriculum.
- PLTW website with interactive videos and assignments

Resources:

Ancillary resources and materials used to deliver instruction are included below:

- Anatomy in Clay Maniken
- Logger Pro 3
- Vernier Sensors
- Dissection Materials: Brain, Eye, Lungs, Synovial Joints
- 3 D Molecular Design Models
- Inspiration and Lucid Chart Concept Mapping Platforms
- Ultrasound Machines
- Pasco Eye Models
- Surviving the Extremes (Autobiography by Kenneth Kamler)

Differentiation Strategies

Differentiation strategies can require varied amounts of preparation time. High-prep strategies often require a teacher to both create multiple pathways to process information/demonstrate learning and to assign students to those pathways. Hence, more ongoing monitoring and assessment is often required. In contrast, low-prep strategies might require a teacher to strategically create process and product choices for students, but students are allowed to choose which option to pursue given their learning profile or readiness level. Also, a low-prep strategy might be focused on a discrete skill (such as vocabulary words), so there are fewer details to consider. Most teachers find that integration of one to two new low-prep

strategies and one high-prep strategy each quarter is a reasonable goal.

Low Prep Strategies (add to list as needed)

Varied journal prompts, spelling or vocabulary lists	Students are given a choice of different journal prompts, spelling lists or vocabulary lists depending on level of proficiency/assessment results.
Anchor activities	Anchor activities provide meaningful options for students when they are not actively engaged in classroom activities (e.g., when they finish early, are waiting for further directions, are stumped, first enter class, or when the teacher is working with other students). Anchors should be directly related to the current learning goals.
Choices of books	Different textbooks or novels (often at different levels) that students are allowed to choose from for content study or for literature circles.
Choices of review activities	Different review or extension activities are made available to students during a specific section of the class (such as at the beginning or end of the period).
Homework options	Students are provided with choices about the assignments they complete as homework. Or, students are directed to specific homework based on student needs.
Student-teacher goal setting	The teacher and student work together to develop individual learning goals for the student.
Flexible grouping	Students might be instructed as a whole group, in small groups of various permutations (homogeneous or heterogeneous by skill or interest), in pairs or individual. Any small groups or pairs change over time based on assessment data.
Varied computer programs	The computer is used as an additional center in the classroom, and students are directed to specific websites or software that allows them to work on skills at their level.
Multiple Intelligence or Learning Style options	Students select activities or are assigned an activity that is designed for learning a specific area of content through their strong intelligence (verbal-linguistic, interpersonal, musical, etc.)
Varying scaffolding of same organizer	Provide graphic organizers that require students to complete various amounts of information. Some will be more filled out (by the teacher) than others.

Think-Pair-Share by readiness, interest, and/or learning profile	Students are placed in predetermined pairs, asked to think about a question for a specific amount of time, then are asked to share their answers first with their partner and then with the whole group.
Mini workshops to re-teach or extend skills	A short, specific lesson with a student or group of students that focuses on one area of interest or reinforcement of a specific skill.
Orbitals	Students conduct independent investigations generally lasting 3-6 weeks. The investigations “orbit” or revolve around some facet of the curriculum.
Games to practice mastery of information and skill	Use games as a way to review and reinforce concepts. Include questions and tasks that are on a variety of cognitive levels.
Multiple levels of questions	Teachers vary the sorts of questions posed to different students based on their ability to handle them. Varying questions is an excellent way to build the confidence (and motivation) of students who are reluctant to contribute to class discourse. Note: Most teachers would probably admit that without even thinking about it they tend to address particular types of questions to particular students. In some cases, such tendencies may need to be corrected. (For example, a teacher may be unknowingly addressing all of the more challenging questions to one student, thereby inhibiting other students’ learning and fostering class resentment of that student.)
High Prep Strategies (add to list as needed)	
Cubing	Designed to help students think about a topic or idea from many different angles or perspectives. The tasks are placed on the six sides of a cube and use commands that help support thinking (justify, describe, evaluate, connect, etc.). The students complete the task on the side that ends face up, either independently or in homogenous groups.
Tiered assignment/ product	The content and objective are the same, but the process and/or the products that students must create to demonstrate mastery are varied according to the students’ readiness level.
Independent studies	Students choose a topic of interest that they are curious about and wants to discover new information on. Research is done from questions developed by the student and/or teacher. The researcher produces a product to share learning with classmates.

4MAT	Teachers plan instruction for each of four learning preferences over the course of several days on a given topic. Some lessons focus on mastery, some on understanding, some on personal involvement, and some on synthesis. Each learner has a chance to approach the topic through preferred modes and to strengthen weaker areas
Jigsaw	Students are grouped based on their reading proficiency and each group is given an appropriate text on a specific aspect of a topic (the economic, political and social impact of the Civil War, for example). Students later get into heterogeneous groups to share their findings with their peers, who have read about different areas of study from source texts on their own reading levels. The jigsaw technique allows you to tackle the same subject with all of your students while discreetly providing them the different tools they need to get there.
Multiple texts	The teacher obtains or creates a variety of texts at different reading levels to assign strategically to students.
Alternative assessments	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. This differentiation creates possibilities for students who excel in different modalities over others (verbal versus visual).
Modified Assessments	Assessments can be modified in a variety of ways – for example by formatting the document differently (e.g. more space between questions) or by using different types of questions (matching vs. open ended) or by asking only the truly essential questions.
Learning contracts or Personal Agendas	A contract is a negotiated agreement between teacher and student that may have a mix of requirements and choice based on skills and understandings considered important by the teacher. A personal agenda could be quite similar, as it would list the tasks the teacher wants each student to accomplish in a given day/lesson/unit. Both Learning contracts and personal agendas will likely vary between students within a classroom.
Compacting	This strategy begins with a student assessment to determine level of knowledge or skill already attained (i.e. pretest). Students who demonstrate proficiency before the unit even begins are given the opportunity to work at a higher level (either independently or in a group).
Literature circles	Flexible grouping of students who engage in different studies of a piece of literature. Groups can be heterogeneous and homogeneous.

<p>Learning Centers</p>	<p>A station (or simply a collection of materials) that students might use independently to explore topics or practice skills. Centers allow individual or groups of students to work at their own pace. Students are constantly reassessed to determine which centers are appropriate for students at a particular time, and to plan activities at those centers to build the most pressing skills.</p>
<p>Tic-Tac-Toe Choice Board (sometimes called “Think-Tac-Toe”</p>	<p>The tic-tac-toe choice board is a strategy that enables students to choose multiple tasks to practice a skill, or demonstrate and extend understanding of a process or concept. From the board, students choose (or teacher assigns) three adjacent or diagonal. To design a tic-tac-toe board: - Identify the outcomes and instructional focus - Design 9 different tasks - Use assessment data to determine student levels - Arrange the tasks on a tic-tac-toe board either randomly, in rows according to level of difficulty, or you may want to select one critical task to place in the center of the board for all students to complete.</p>
<p>Curriculum development Resources/Instructional Materials:</p>	
<p>List or Link Ancillary Resources and Curriculum Materials Here:</p> <ul style="list-style-type: none"> ● PLTW website 	
<p>Board of Education Approved Text(s)</p>	
<ul style="list-style-type: none"> ● PLTW website 	

