

AP/CB Physics 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**

The most recent review and revision of the standards occurred in 2014. However, the standards in language arts and math underwent an additional review in 2015 with adoption by the New Jersey State Board of Education in May 2016.

Lower Cape May Regional School District AP Physics Curriculum	
Content Area: Physics	
Course Title: AP/CB Physics	Grade level: 12
Unit 1: Kinematics	Dates for Units: September- November
Unit 2: Dynamics	Dates for Units: November- February
Unit 3: Waves and Optics	Dates for Units: February- April
Unit 4: Electricity and Magnetism	Dates for Units: April- June
Date Created: 9/1/18 Date Revised: 11/2019	Board Approved On: 11/21/19

Lower Cape May Regional School District AP Physics Curriculum Unit 1 Overview
Content Area: Physics
Unit Title: Kinematics
Target Course/Grade Level: CB Physics / Grade 12
Unit Summary: <ul style="list-style-type: none"> • Kinematics Unit covers topics that have to do with the way an object or body moves i.e. the properties of motion in an object. This unit covers Distance Travelled vs Displacement, Speed vs Velocity, 1D Motion, 2D Motion and Acceleration in both Translational motion and Rotational motion terms.

Interdisciplinary Connections:

- This unit has a connection to Math topics covered in both Algebra and Trigonometry. Students use basic algebra functions to manipulate equations to solve for the missing variable as well as using the trig functions, Sine, Cosine, and Tangent to combine vectors.
- This unit has a connection to History through learning about the scientists that discovered and developed the formulas and theories used in class. Students are taught about Sir Issac Newton and Albert Einstein as well as Galileo and other classical physicists.
- This unit has a connection to English topics due to students being required to write formal lab reports for labs done in class. Students are required to write in correct format and use correct grammar throughout this unit.

21st Century Themes, Skills, and Standards:

- CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.
- Technology utilization in the form of lab equipment to record data, laptops used to write formal lab reports as well as research topics covered in instruction and lab work and used to watch online videos (reviews, demonstrations,etc) and run lab simulations which are not able to be run in the classroom.
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
1	Represent forces in diagrams or mathematically using appropriately labeled vectors with magnitude, direction, and units during the analysis of a situation.(PS2.A)
2	Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration (HS-PS2-1)
3	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-ETS1-2)

4	Understand and apply the relationship between the net force exerted on an object, its inertial mass, and its acceleration to a variety of situations.(PS2.A)
5	Given a graph of position or velocity as a function of time, recognize in what time intervals the position, velocity and acceleration of an object are positive, negative, or zero and sketch a graph of each quantity as a function of time. (PS2.A)
<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> ● How do we categorized the different properties of a moving body? ● What information do we need to solve for so that we can explain how a body is moving? ● How can we gather data about a situation that we are observing in the physical world 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> ● Students will become cognizant of the importance of the study of physical interactions and be able to predict the outcome of physical events by the application of formulas and mathematical constants. ● Students will understand how mathematics relates to the physical world around us. ● The student will understand the relationship of past discoveries in science to present discoveries and how new studies build upon the past while sometimes completely eclipsing prior understanding.
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● Students will know how to calculate all the factors that define the motion of a body moving in a linear path ● Students will know how to use kinematic equations to solve for missing variable i.e. Speed, Velocity, displacement, acceleration and Time. ● Students will know the similarities and differences between vector and scalar quantities 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Students will be able to compare and contrast the differences between vector and scalar quantities, displacement and distance travelled, and velocity and Speed by citing specific qualities of each. ● Students will be able to explain and calculate the net velocity and acceleration of a moving body based on its characteristics by using formulas learned in class ● Students will be able to identify an object's motion based on different types of graphs.

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**Lower Cape May Regional School District AP Physics Curriculum
Unit 2 Overview**

Content Area: Physics

Unit Title: Dynamics

Target Course/Grade Level: CB Physics / Grade 12

Unit Summary:

- Dynamics Unit covers topics that explain why an object or body is moving the way it is i.e the reason it is in motion or not. The topics covered in the Dynamics unit include, Forces, Newton's Laws of motion, Work, Power, Energy and Momentum in both Translational and Rotational terms.

Interdisciplinary Connections:

- This unit has a connection to Math topics covered in both Algebra and Trigonometry. Students use basic algebra functions to manipulate equations to solve for the missing variable as well as using the trig functions, Sine, Cosine, and Tangent to combine vectors.
- This unit has a connection to History through learning about the scientists that discovered and developed the formulas and theories used in class. Students are taught about Sir Issac Newton and Albert Einstein as well as Galileo and other classical physicists.
- This unit has a connection to English topics due to students being required to write formal lab reports for labs done in class. Students are required to write in correct format and use correct grammar throughout this unit.

21st Century Themes, Skills, and Standards:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP7. Employ valid and reliable research strategies.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

- Technology utilization in the form of lab equipment to record data, laptops used to write formal lab reports as well as research topics covered in instruction and lab work and used to watch online videos (reviews, demonstrations, etc) and run lab simulations which are not able to be run in the classroom.
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
1	Calculate changes in kinetic energy and gravitational potential energy of a system using representations of that system. (PS3.A)
2	Identify and quantify the various types of energies within a system of objects in a well-defined state, such as elastic potential energy, gravitational potential energy, kinetic energy, and thermal energy and represent how these energies may change over time. (PS3.A and PS3.B)
3	Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. (HS-ESS1-4)
4	Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects). (HS-PS3-2)
5	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-ETS1-2)
6	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. (HS-ETS1-4)
7	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. (HS-PS3-1)

<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> ● What is causing the motion of a moving body/object? ● How can we explain the reason why the behaviour of an object/body in motion? ● What information do we need to solve for so that we can explain why a object/body is moving? ● How can we gather data about a situation that we are observing in the physical world? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> ● Students will become cognizant of the importance of the study of physical interactions and be able to predict the outcome of physical events by the application of formula and mathematical constants. ● Students will understand how mathematics relates to the physical world around us. ● The student will understand the relationship of past discoveries in science to present discoveries and how new studies build upon the past while sometimes completely eclipsing prior understanding. ● Students will understand the “Why” of physical phenomena in their everyday life.
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● How an object behaves while undergoing rotational and circular motion ● The reason why astral bodies move in the way they do. ● The cause of gravity and how it affects all objects ● The laws of conservation of momentum and energy 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Explain and discuss the forces that are in effect while an object is rotating and spinning ● Calculate the amount of momentum and energy an object has while in motion by using formulas learned in class ● Predict the path of astral bodies will take as they move through space based on laws of motion and formulas developed in class ● Calculate the speed, velocity, acceleration and forces on an object undergoing motion of any kind by using formulas learned in class

**Lower Cape May Regional School District AP Physics Curriculum
Unit 3 Overview**

Content Area: Physics

Unit Title: Waves and Optics

Target Course/Grade Level: CB Physics / Grade 12

Unit Summary:

- Waves and optics covers topics that explain the way waves move through a medium. This includes sound waves, physical waves, light waves, as well as the causes of waves and the characteristics that make up a waves such as amplitude, wavelength, frequency and wave speed.

Interdisciplinary Connections:

- This unit has a connection to Math topics covered in both Algebra and Trigonometry. Students use basic algebra functions to manipulate equations to solve for the missing variable as well as using the trig functions, Sine, Cosine, and Tangent to combine vectors.
- This unit has a connection to History through learning about the scientists that discovered and developed the formulas and theories used in class. Students are taught about Sir Issac Newton and Albert Einstein as well as Galileo and other classical physicists.
- This unit has a connection to English topics due to students being required to write formal lab reports for labs done in class. Students are required to write in correct format and use correct grammar throughout this unit.

21st Century Themes, Skills, and Standards:

- CRP1. Act as a responsible and contributing citizen and employee.
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CRP11. Use technology to enhance productivity.
- Technology utilization in the form of lab equipment to record data, laptops used to write formal lab reports as well as research topics covered in instruction and lab work and used to watch online videos (reviews, demonstrations,etc) and run lab simulations which are not able to be run in the classroom.

- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
1	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. (HS-PS4-1)
2	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. (HS-PS4-3)
3	Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy. (HS-PS4-5)
<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> ● How does a wave get created? ● How is wave speed affected by frequency, wavelength and medium which the wave is traveling through? ● How do we see waves and can we see all types of waves, and does it depend on the medium it is moving through 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> ● A wave is a vibration accompanied by a transfer of energy (not matter) that travels through a medium (space or mass). ● Modeling of a wave as it propagates through a medium will show Wave behavior and interference with other waves and boundaries ● Depending on the type of wave and the medium through which the wave is passing affects the wavelength, frequency and the speed of the waves
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● What the relationship is between wavelength, frequency and wave 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Model the difference between waves ● Identify the difference between transverse,

<p>speed.</p> <ul style="list-style-type: none"> ● How to determine the amplitude, frequency, wavelength and other waves characteristic from a graph of the wave on a sine curve. ● The behavior of interacting waves including interference and after the interaction ● The difference between an electromagnetic and mechanical wave, how each wave propagates, and label/identify the various parts of each wave (e.g. crest, trough, wavelength, compression, etc) 	<p>longitudinal, mechanical and electromagnetic waves</p> <ul style="list-style-type: none"> ● Describe beats and harmonics as a result of wave interference ● Use information on interference to predict the outcome for two interacting waves ● calculate all properties of a wave given information on its behavior
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**Lower Cape May Regional School District AP Physics Curriculum
Unit 4 Overview**

Content Area: Physics

Unit Title: Electricity and DC Circuits

Target Course/Grade Level: CB Physics / Grade 12

Unit Summary:

- This unit is a look at electronic laws and components in DC circuits, emphasizing the study and application of network theorems interrelating voltage, current and resistance. Students apply practical mathematics as it supports understanding the principles of electronics. A laboratory provides practical experience using both physical components and computer-generated simulations.

Interdisciplinary Connections:

- This unit has a connection to Math topics covered in both Algebra and Trigonometry. Students use basic algebra functions to manipulate equations to solve for the missing variable as well as using the trig functions, Sine, Cosine, and Tangent to combine vectors.
- This unit has a connection to History through learning about the scientists that discovered and developed the formulas and theories used in class. Students are taught about Sir Issac Newton and

Albert Einstein as well as Galileo and other classical physicists.

- This unit has a connection to English topics due to students being required to write formal lab reports for labs done in class. Students are required to write in correct format and use correct grammar throughout this unit.

21st Century Themes, Skills, and Standards:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP7. Employ valid and reliable research strategies.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
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- CRP11. Use technology to enhance productivity.
- Technology utilization in the form of lab equipment to record data, laptops used to write formal lab reports as well as research topics covered in instruction and lab work and used to watch online videos (reviews, demonstrations, etc) and run lab simulations which are not able to be run in the classroom.
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit
1	Make predictions about the sign and relative quantity of net charge of objects or systems after various charging processes. (PS2.B)
2	Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects. (HS-PS2-4)
3	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current. (HS-PS2-5)

<p>Unit Enduring Questions:</p> <ul style="list-style-type: none"> ● How do electric potential and current vary throughout electric circuits consisting of resistors and/or capacitors ● How can you use the words electron, current, voltage and resistance to describe an electrical circuit? ● How do we measure the different values in a DC circuit? ● How do we direct the flow of electricity to go where we want it to go? ● How do we measure electricity and what is electrical power? ● 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> ● All electrical circuits must be comprised of a power source, a load and a path for electricity to flow. ● With the proper equation, every aspect of an electrical circuit can be calculated mathematically. ● Electrical circuits have an interdependent relationship which can be harnessed and later utilized to do work
<p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● that by using accessible physical resources they can further their knowledge of current electrical technology ● that applying and demonstrating science and mathematical concepts are needed to complete electrical projects. (i.e. Ohms Law, volts, resistance , and amps) ● that using experiences in DC electricity will assist with future in - class and real-world projects and careers. 	<p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● implementation Ohm’s law in calculating volts, amps, and ohms in a given circuit. ● implement rules of parallel and series electrical circuits in calculating circuit values ● describe in drawing, writing, and verbalizing the operation of a given circuit ● follow schematic and written instructions to complete a circuit and answer questions regarding the circuit.

<p>Lower Cape May Regional School District AP Physics Curriculum Evidence of Learning</p>
<p>Specific Formative Assessments Utilized in Daily Lessons:</p>

- Students use personal white boards to answer questions and solve problems out and are directed to hold them up when finished for me to check. Students are asked to solve problems at random up on the front board to check understanding and to peer review if incorrect. Students are asked to do exit tickets anonymously that say what they think is most confusing about today's topic as well as what they think is the easiest to understand.
- Students will use Kahoot, Albert.io, as well as trashketball and jeopardy review games

Summative Assessment Utilized throughout Units:

- Tests and quizzes
- Mini quiz and reading checks
- Lab reports as well as inquiry based investigations

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

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. Links to relevant content standards can be found below:

Project-based Learning Tasks:

- Formal Lab reports
- Lab packets
- Discovery based Labs
- End of the year Trebuchet/Mousetrap Project

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. Applicable technology utilized in this curricula are included below:
- Vernier LabQuest 2
- Laptop Computers
- Slow Motion Cameras
- Vernier Sensors (Multiple types)
- Youtube and other video based instruction sites
- Online Review Sites such as Kahoot and Albert.io

Resources:

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

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.
Learning Centers	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.
Tic-Tac-Toe Choice Board (sometimes called “Think-Tac-Toe”)	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.
Curriculum development Resources/Instructional Materials:	
List or Link Ancillary Resources and Curriculum Materials Here: <ul style="list-style-type: none"> ● https://www.frhsd.com/cms/lib/NJ01912687/Centricity/Domain/19/Electronics%20I.pdf ● https://www.rtnj.org/site/handlers/filedownload.ashx?moduleinstanceid=2460&dataid=10522&FileName=Physics_Curriculum.pdf ● https://www.state.nj.us/education/aps/cccs/science/ 	
Board of Education Approved Text(s)	
<ul style="list-style-type: none"> ● “Physics”- Giancoli 6th Edition ● “Pearson Physics” - James S. Walker 	