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|  | **Science Personal Curriculum Plan**  **Physics** | Date: |

### STUDENT INFORMATION

Name: DOB: Current Grade:

1. **MMC CREDIT AUDIT- (*Check which credits have already been earned & enter date of completion, 3 credits are required.)***

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| --- | --- | --- | --- | --- | --- |
| Anatomy | Agricultural Science | Biology | Chemistry | Physics | Additional Science |
| Completed:  Physical Science  Completed: | Completed:  Earth Science  Completed: | Completed: | Completed: | Completed: | Credit Completed: |

### MMC SCIENCE CREDIT DESCRIPTION

* + 1 credit of Biology required
  + 2 credits of either Chemistry, Physics, Anatomy or Agricultural Science
  + May fulfill 3rd science credit by completing an approved computer science program, a state approved CTE program, or a district approved science course.

### MMC SCIENCE CONTENT MODIFICATION OPTION

* + Modify content expectations in Science--only available to students eligible for special education with an IEP

1. **CONTENT MODIFICATION REQUESTED- *(Check & date when modification was completed.)***

Physics

Completed:

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|  | **6.** | **RATIONALE FOR MODIFICATION:** |
|  | **7.** | **PERSONAL CURRICULUM – *Complete only for students with an IEP who require modified content expectations*. Below are suggested essential learning standards in this content area for students. They are considered appropriate for most students. The Personal Curriculum allows for the use of these for students with an IEP.** |
|  | **#** | **Essential Learning Standards – Physics** |
|  |  | **\*Note: Local districts may choose to modify or remove content standards as needed for students with an IEP.** |
|  | P1 | **Inquiry, reflection, and social implications** – Students will understand the nature of science and demonstrate an ability to practice scientific reasoning by applying it to the design, execution, and evaluation of scientific investigations. Students will demonstrate their understanding that scientific knowledge is gathered through various forms of direct and indirect observations and the testing of this information by methods including, but not limited to, experimentation. They will use their scientific knowledge to assess the costs, risks, and benefits of technological systems as they make personal choices and participate in public policy decisions. These insights will help them analyze the role science plays in society, technology, and potential career opportunities. |
|  | P1.1A | Generate new questions that can be investigated in the laboratory or field. |
|  | P1.1B | Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions. |
|  | P1.1C | Conduct scientific investigations using appropriate tools and techniques (e.g. selecting an instrument that measures the desired quantity – length, volume, weight, time interval, temperature, – with the appropriate level of precision). |
|  | P1.1D | Identify patterns in data and relate them to theoretical models. |
|  | P1.1E | Describe a reason for a given conclusion using evidence from an investigation. |
|  | P1.2A | Critique whether or not specific questions can be answered through scientific investigations. |

**Instructional methods and assessments should be matched to learner needs. These essential learning standards will be assessed using multiple methods with an aggregate proficiency level of 60% or higher.**

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|  | **Science Personal Curriculum Plan**  **Physics** | Date: |

# Student:

Content Area: Physics (Cont.)

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| **7. PERSONAL CURRICULUM – Complete only for students with an IEP who require modified content expectations. List or review the essential learning standards for the student in the specified content area above.** | | |
| **#** | | **Essential Learning Standards** |
| P1.2B | | Identify and critique arguments about personal or societal issues based on scientific evidence. |
|  | P1.2C | Develop an understanding of a scientific concept by accessing information from multiple sources. Evaluate the scientific accuracy and significance of the information. |
|  | P1.2D | Evaluate scientific explanations in a peer review process or discussion format. |
|  | P1.2E | Evaluate the future career and occupational prospects of science fields. |
|  | P2 | **Motion of Objects** – The universe is in a state of constant change. From small particles (electrons) to the large systems (galaxies) all things are in motion. Therefore, for students to understand the universe they must describe and represent various types of motion. Kinematics, the description of motion, always involves measurements of position and time.  Students must describe the relationships between these quantities using mathematical statements, graphs, and motion maps. They use these representations as powerful tools to not only describe past motions but also predict future events. |
|  | P2.1AB | Calculate the average speed of an object using the change of position and elapsed time. Represent the velocities for linear and circular motion using motion diagrams (arrows on strobe pictures). |
|  | P2.1CD | Create line graphs using measured values of position and elapsed time. Describe and analyze the motion that a position-time graph represents, given the graph. |
|  | P2.1EF | Describe and classify various motions in a plane as one dimensional, two dimensional, circular, or periodic. Distinguish between rotation and revolution and describe and contrast the two speeds of an object like the Earth. |
|  | P2.2B | Use the change of speed and elapsed time to calculate the average acceleration for linear motion. |
|  | P2.2C | Describe and analyze the motion that a velocity-time graph represents, given the graph. |
|  | P3 | **Forces and Motion** – Students identify interactions between objects either as being by direct contact (e.g., pushes or pulls, friction) or at a distance (e.g., gravity, electromagnetism), and to use forces to describe interactions between objects. They recognize that non-zero net forces always cause changes in motion (Newton’s first law). These changes can be changes in speed, direction, or both. Students use Newton’s second law to summarize relationships among and solve problems involving net forces, masses, and changes in motion (using standard metric units). They explain that whenever one object exerts a force on another, a force equal in magnitude and opposite in direction is exerted back on it (Newton’s third law). |
|  | P3.1A | Identify the force(s) acting between objects in “direct contact” or at a distance. |
|  | P3.2A,C | Identify the magnitude and direction of everyday forces (e.g., wind, tension in ropes, pushes and pulls, weight). Calculate the net force acting on an object. |
|  | P3.2B | Compare work done in different situations. |
|  | P3.4A | Predict the change in motion of an object acted on by several forces. Solve problems involving force, mass, and acceleration in linear motion (Newton’s second law). |
|  | P3.4B | Identify forces acting on objects moving with constant velocity (e.g., cars on a highway). |
|  | P3.4D | Identify the force(s) acting on objects moving with uniform circular motion (e.g., a car on a circular track, satellites in orbit). Understand why uniform circular motion involves acceleration without a change in speed. |
|  | P3.6A | Explain earth-moon interactions (orbital motion) in terms of forces. |

**Instructional methods and assessments should be matched to learner needs. These essential learning standards will be assessed using multiple methods with an aggregate proficiency level of 60% or higher.**

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|  | **Science Personal Curriculum Plan**  **Physics** | Date: |

Student: Content Area: Physics (Cont.)

**Instructional methods and assessments should be matched to learner needs. These essential learning standards will be assessed using multiple methods with an aggregate proficiency level of 60% or higher.**

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| **7. PERSONAL CURRICULUM – *Complete only for students with an IEP who require modified content expectations.***  **List or review the essential learning standards for the student in the specified content area above.** | | | |
| **#** | | | **Essential Learning Standards** |
|  | | P3.6B | Predict how the gravitational force between objects changes when the distance between them changes. |
|  | | P3.6C | Explain how your weight on Earth could be different from your weight on another planet. |
|  | | P4 | **Forms of Energy and Energy Transformations –** Energy is a useful conceptual system for explaining how the universe works and accounting for changes in matter. Energy is not a “thing.” Students develop several energy-related ideas: First, they keep track of energy during transfers and transformations, and account for changes using energy conservation. Second, they identify places where energy is apparently lost during a transformation process, but is actually spread around to the environment as thermal energy and therefore not easily recoverable. Third, they identify the means of energy transfers: collisions between particles, or waves. |
|  | | P4.1A | Account for and represent energy into and out of systems using energy transfer diagrams. |
|  | | P4.1B | Explain instances of energy transfer by waves and objects in everyday activities (e.g., why the ground gets warm during the day, how you hear a distant sound, why it hurts when you are hit by a baseball). |
|  | | P4.2B | Name devices that transform specific types of energy into other types (e.g., a device that transforms electricity into motion). |
|  | | P4.2CD | Explain how energy is conserved in common systems (e.g., light incident on a transparent material, light incident on a leaf, mechanical energy in a collision). Explain why (for example) all the stored energy in gasoline does not transform to mechanical energy of a vehicle. Explain why all mechanical systems require an external energy source to maintain their motion. |
|  | | P4.4A | Describe specific mechanical waves (e.g., on a demonstration spring, on the ocean) in terms of wavelength, amplitude, frequency, and speed. |
|  | | P4.4B | Identify everyday examples of transverse and compression (longitudinal) waves. Compare and contrast transverse and compression (longitudinal) waves in terms of wavelength, amplitude, and frequency. |
|  | | P4.5AB | Identify everyday examples of energy transfer by waves and their sources. Explain why an object (e.g., fishing bobber) does not move forward as a wave passes under it. |
|  | | P4.5C | Provide evidence to support the claim that sound is energy transferred by a wave, not energy transferred by particles. |
|  | | P4.6A | Identify the different regions on the electromagnetic spectrum and compare them in terms of wavelength, frequency, and energy. |
|  | | P4.6B | Explain why radio waves can travel through space, but sound waves cannot. |
|  | | P4.6CD | Explain why there is a delay between the time we send a radio message to astronauts on the moon and when they receive it. Explain why we see a distant event before we hear it (e.g., lightning before thunder, exploding fireworks before the boom). |
|  | | P4.10A | Describe the energy transformations when electrical energy is produced and transferred to homes and businesses. |
|  | | P4.10B | Identify common household devices that transform electrical energy to other forms of energy, and describe the type of energy transformation. |
| P4.10B | | | Identify common household devices that transform electrical energy to other forms of energy, and describe the type of energy transformation |
|  | P4.10D | | Discriminate between voltage, resistance, and current as they apply to an electric circuit. |
|  | P4.12A | | Describe peaceful technological applications of nuclear fission and radioactive decay. |
|  | P4.12B | | Describe possible problems caused by exposure to prolonged radioactive decay. |
|  | P4.12C | | Explain how stars, including our Sun, produce huge amounts of energy (e.g., visible, infrared, ultraviolet light). |

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|  | **Science Personal Curriculum Plan**  **Physics** | Date: |

# Student:

Content Area: Physics (cont.)

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| Reporting Period | Status\* | Comments |
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Additional Comments:

## \*Status Key: 1 – All essential learning standards are met

1. – Making progress to meet essential learning standards by the end of semester/trimester
2. – Needs to improve progress to meet essential learning standards by the end of semester/trimester