**Pequea Valley School District**

**STEM Department**

**Unit: Maglev Vehicle Course: STEM 9 Grade: 9**

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| **Planning the Focus Based on the Desired Result**  **What do you want all students to know, understand and do by the end of the unit?** |
| **Unit Essential Question(s)**  How does aerodynamics affect the acceleration of a maglev vehicle? |
| **Keystone Eligible Content/PA Core Standard**  **3.2.10.B** Apply process knowledge and organize scientific and technological phenomena in varied ways  **3.2.10.D** Identify and Apply the technological design process to solve problems.  **3.6.10.C** Apply Physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, research and design to real world problems.  **3.7.10.A** Identify and safely use a variety of tools, basic machines, materials, and techniques to solve problems and answer questions |
| **Pacing: Approximate number of class sessions per unit**  13 |
| **Tier 3 Vocabulary (Content specific vocabulary)**  Magnetism, Lodestone, electromagnetism, voltage, current, drag, turbulence, drag coefficient, acceleration, maglev |
| **Know -** What do students need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge “nuggets”.***   * The characteristics of magnets and electromagnetism * How aerodynamics affects acceleration in a maglev vehicle * What a vacuum former does |
| **Understand -** What do students need to **understand**? What is the **big idea**? ***List broad concepts or “big ideas” in a statement of enduring understanding.***   * How electromagnets are used in society * The procedures to operate the vacuum former |
| **Learning Outcome -** What do students need to be able to **accomplish** by the unit’s end? ***List skills and competencies.***   * Learners will design and prototype a maglev vehicle that will be tested for acceleration on a maglev track and photogates. This vehicle will be prototyped of foam and then finalized with a vacuum former. * Learners will use materials to create an complete an electromagnetic lab |
| **Assessments:** |
| **Software/Resources:**  Vacuum former |