**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
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| **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
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| **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
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| **Assessments:** |
| **Software/Resources:**Vacuum former |