**Pequea Valley School District**

**STEM Department**

**Unit: Concrete Testing Course: STEM9 Grade: 9th**

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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 can materials be tested to determine their appropriate application?* Following Directions/Process
* Proportions
* Materials Testing
* Analyzing and Creating Scatter Plots
* Collecting Data
* Solving Linear Equations with a Graphing Calculator
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| **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**9 Class Periods |
| **Tier 3 Vocabulary (Content specific vocabulary)****Concrete****Cement****Mortar****Scatter Plot****Linear Equation****Slope****Y-Intercept****Regression****Dependent Variable****Independent Variable****PSI** |
| **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”.**** **Learners know how to follow directions and mix mortar samples using proportions.**
* **Learners know how to test mortar for strength using an industrial compression strength tester.**
* **Learners will be able to create a scatter plot to represent data.**
* **Learners will be able to create a mathematical model (linear equation) to represent data and predict future data points.**
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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.**** **Learners will understand how to complete material testing to produce data and format mathematical models.**
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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 complete the Concrete Testing project. This project requires learners to collect data, graph the data on a scatter plot, and create a linear equation to mathematically model the data.
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| **Assessments:** Project is Aligned to the Algebra Keystone |
| **Software/Resources:** |

Authentic Learning Experience: This unit includes a partnership with Dutchland Concrete and consists of a guest speaking opportunity and a local plant tour.