**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 |
| **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.** |
| **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.** |
| **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. |
| **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.