**Dover Area School District Curriculum K-U-D**
**Middle School STEM- Grade 6**

| Standard | Know | Understand | Do |
|---|---|---|---|
| Standard - 3.4.6.D1: Apply a design process to solve problems beyond the laboratory classroom. | Students will be able to define and explain the steps of the engineering design process.<br>1 Identify the Problem: Set Criteria and Constraints<br>2. Explore the Problem: Research<br>3. Plan your Solution<br>4. Build / Create your Solution<br>5. Test your design<br>6. Make Improvements using Data<br>7. Repeat Until Problem is Solved<br>8. Present Findings | Use Engineering Design Process to Solve Problems. | Complete an Engineering Design Process to Solve Complex Problems |
| Eligible Content - S6.A.1.1.3 Predict the outcome of an experiment based on previously collected data. | Previous Testing or Scale Testing creates useable Data.<br>Scale Testing, Analysis, Observation. | Data can be used to make improvements | Using Data, students will be able to make improvements to their designs |
| Eligible Content - S7.C.3.1.1 Describe how unbalanced forces acting on an object change its velocity. | Unbalanced Forces move objects<br>Balanced Forces cause objects to maintain current status<br>Students will be able to define key vocabulary associated with forces and motion<br>Thrust, Weight, Lift, Drag | Balanced vs Unbalanced forces and their effect on motion | Students will develop a device that moves and be able to identify the forces on that object. |
| Standard - 3.2.6.B3: Give examples of how heat moves in predictable ways, normally flowing from warmer objects to cooler ones until they reach the same temperature. Explain the effect of heat on particle motion by describing what happens to particles during a phase change | Students will be able to define key vocabulary associated with the transfer of thermal energy<br>Conduction, Convection, Radiation, Insulation, Solid, Liquid, Gas, Kinetic Theory of Matter | Heat moves through conduction, convection, and radiation. Heat transfer can not be stopped, only slowed down. | Evaluate the effectiveness of different insulation materials<br>Build a device to insulate an object |
| Standard - 3.4.6.B2: Describe how technologies can be used to repair damage caused by natural disasters and to break down waste from various products and systems | Students will be able to define key vocabulary associated earthquakes and structural engineering.<br>Fault Lines, Surface Waves, Body Waves, Tectonic Plates, Tension, Compression, Shear Force | Earthquakes damages can be reduced through technology and preventative engineering | Identify technologies used to mitigate and repair damage caused by natural disasters. |
| Standard - S7.A.1.2: Identify and explain the impacts of apply scientific, environmental, or technological knowledge to address solutions to practical problems. | Students will be able to define key vocabulary associated with magnetic levitation vehicles.<br>Attract, Repel, Polarity, Electromagnets. | Magnetic levitation vehicles reduce friction by floating but are not practical in all situations. | Build a functional magnetic levitation vehicle. |