Technology Engineering Syllabus
6th 7th & 8th Grade
Program Overview

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The Science/Technology Engineering program at the Rupert A. Nock middle school is a hands on program that utilizes physics, the Engineering Design Process, computer aided design, and mechanical technologies as outlined in the Science/Technology Engineering Massachusetts Curriculum Frameworks to educate and problem solve.

In each grade level, students design, build and test their solutions to assigned problems. Prototypes are constructed in the shop using: hammers, nails, glue, band saws, disk sanders, hand saws, and a drill press. Before students operate any machinery independently they must participate in safety training and demonstrate competency using all of the machines in a supervised environment. Once proper operating procedures have been reviewed and demonstrated by every student, the assembly of the project can begin.

Program Overview

Grade 6 Mouse Trap Cars and Water Rockets:

- A challenging project used at engineering colleges and universities around the country. Students design and create an alternatively powered (mouse trap) transportation vehicle that can travel as great a distance as possible on one cycle of the mouse trap. Throughout the project students learn about physics, construction and transportation technologies, engineering design process and alternative energy as outlined in the Mass. Curriculum Frameworks for Technology Engineering. The current MTC longest distance traveled student record is going on its third year of 43.5 meters (141ft).
- Water rockets use air pressure and water as propellants. Students will design, build and test a water rocket that can travel a distance of at least 50 yards and achieve an altitude of at least 50ft. Each rocket must carry an egg and be able to impact the ground without causing damage to the egg cargo.

Grade 7 Bridges:

- Students design, build, and test their own bridges to calculate engineering and design efficiency. Students will know and be able to identify the 5 basic types of bridges, forces that influence bridges, and the type of bridge designs that would be used for a given situation. Physics and construction technologies will be addressed as they relate to the state TE frameworks. We had a new student bridge "most weight held" record is 411 lbs with a 2.41 lb/g engineering efficiency.

Grade 8 Lego Robotics CO2 Cars:

- Because of the incredible generosity of Mike Strem (Founder of Strem Chemical) we were able to create a new $60k computer / robotics program here at the middle school. Students will work in teams of two creating and constructing a Lego robot. Once complete, the robots and their programmers will be put to the test completing challenges while having lots of fun. Robotics integrates math, science and engineering to problem solve in a hands on environment
- Students design, build and test their own CO2 car on an elevated track that will be set up in the shop. Some cars will travel more than 60ft in less than a second and reach speeds of up to 70mph.