

Plymouth Public Schools' Science and Technology/Engineering Program

Technology Engineering for Grades 6 and 7 Course Syllabus

STE046 Technology Engineering 1 (for students in grade 6)

STE056 Technology Engineering 2 (for students in grade 6)

STE027 Technology Engineering 3 (for students in grade 7)

STE037 Technology Engineering 4 (for students in grade 7)

Each course is a quarter of a semester long and intended for students in grades 6 or 7 depending on the specific course (see above)

Course Description

This series of courses is intended to extend and deepen student mastery of technology and engineering concepts presented in elementary and middle grades. Classroom investigations will develop students' understanding of disciplinary core ideas in engineering and technological systems (e.g., transportation, structural, communication). Emphasis will be placed on student-driven problem solving and critical thinking. Scientific and engineering practices will be woven throughout, with a focus on designing, building, testing, evaluating, and redesigning prototypes and/or models of solutions to problems. These courses will reinforce student learning and mastery of content in Science 6 and Science 7 courses. It will also help prepare students in demonstrating proficiency on the MCAS exam in Science and Technology/Engineering given in grade 8.

Instructional Objectives

Students will independently and collaboratively:

1. Engage in scientific inquiry and engineering design through the use of science and engineering practices.
2. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to answer a question or solve a problem.
3. Draw evidence from literary or informational texts to support analysis, reflection, and research.
4. Produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose and audience.
5. Demonstrate proficiency in phenomena related to technology and engineering including, but not limited to engineering design; materials, tools, and manufacturing; and technological systems.

Themes and Topics

1. Grade 6
 - A. Define criteria and constraints of a design problem including potential impacts on people/environment
 - B. Create visual representations of solutions to a design problem.

- C. Communicate design solutions
 - D. Analyze and compare properties of materials to be selected for use in design solutions
 - E. Choose and safely use tools for use in constructing design solutions (e.g., prototypes)
 - F. Determine function of object for which it was designed
2. Grade 7
- A. Evaluate competing solutions to a given design problem to determine how well each meets criteria and constraints of the problem
 - B. Generate and analyze data from iterative testing for optimization
 - C. Construct a prototype of a solution
 - D. Explain the function of a communication system, role of its components, and the benefits and drawbacks of different types (e.g., radio, television, print, internet)
 - E. Research how transportation systems are designed and how they are constructed differently to move people and goods using a variety of vehicles and devices
 - F. Show how components of a structural system work together to serve a function/maintain an environment for human use
 - G. Use the concept of systems engineering to analyze and model components of technological system

Text and Instructional Materials

Hacker, Michael, and Dave Burghardt. *Technology Education: Learning by Design*. Upper Saddle River, NJ: Pearson/Prentice Hall, 2004.

Cheating/Plagiarism

The excerpt from the Plymouth Public Schools' Student Handbook on plagiarism and copyright infringement states, "Existing copyright law will govern the use of material accessed through network. The user will not plagiarize works found on the Internet. Plagiarism is taking the ideas or writings of others and presenting them as if they were yours. All copyrighted material used must have the express written permission of the person or organization that owns the copyright. Any student who has cheated on any academic exercise will receive no credit for that exercise. Plagiarism is a form of cheating. A parent/guardian will be notified by the involved teacher in all instances of cheating. The investigation of the claim of cheating and plagiarism will involve the student, teacher, and administration."

Grading Policy and Assessment

Levels of proficiency on various tasks and assignments determine student grades. During each grading term, students' grades will be based upon the following:

- 20% Class Work: project sheets, computer aided designs, etc.
- 80% Assessments: tests, quizzes, etc.