# Nanotechnology Unit Summary

For this activity, the students in the senior design capstone course of the Engineering Academy at North Penn High School will study and perform formal research in the emerging field of nanotechnology. The students will collaborate in teams of three; each with a specific responsibility. Their ultimate goal will be to design and perform their own electrospinning experiments that will plot the diameter of their electrospun nanofibers as a function of a series of identified variables such as: (1) polymer concentration, (2) electric field strength and (3) collection plate distance. The students will research the chemical properties of the polymer, locate and summarize the eight major sections of its Material Safety Data Sheet and identify how to measure, create and store their polymer solutions. Engineering documentation, design of experimentation, web-based proposal and documentation development, a study of the societal impacts of nanotechnology, properties of polymeric materials, chemistry and physics in the materials environment, and the use of high level instrumentation at Drexel University in Philadelphia, PA are all a part of the proposed activity.

This activity is like no other at the high school level. Students participating in the Future is N.E.A.R. (Nanotechnology Education And Research) program will be applying their knowledge of nanoscience and nanotechnology to engineering research through the use of higher level mathematics, statistical analysis, physics (quantum vs. Newtonian), chemistry and formal research. Through this rigorous research activity, students will learn to design their own experiments, analyze, quantify, assess and present their collected research data while at the same time, prepare themselves for the rigors of college life and the competitive, globalized world.