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Curriculum Units by Fellows of the National Initiative
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Materials for the Future

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This unit is designed to create a final project for a high school Chemistry 1 course or to be used during a non-AP, Chemistry 2 course. It is an opportunity for students to apply their knowledge of bonding, intermolecular forces, and molecular composition. In particular the major objective is for students to see the correlation between molecular arrangement and properties of matter. Students will look at the different properties of plastics and relate these to the properties and uses of the materials. This will necessitate students learning about polymers and the different opportunities for interaction between the longer strand molecules. The unit is designed to focus more on representing the molecules as strands, rather than covering the particulars of each molecule's specific composition and arrangement. Some time will also be spent on nanochemistry as this is the thrust for new materials. Demonstrations and labs are provided to help re-enforce concepts. As a final activity students will be asked to think of a material that they think would be useful or even fanciful, and then determine the required properties of this material at the macro-level and then translate these properties to molecular structural requirements. This may only entail designing the necessary sub-units without actually designing an assembly process.

(Developed for Chemistry I Gifted, grade 10, and Chemistry II Non-AP, grades 11-12; recommended for Chemistry First Level, High Level, and Second Level Chemistry class, High School grades)

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