Shaping Authentic Practices by Engaging in Modeling of A Topic with Teachers to Explore Research in Science (SHAPE MATTERS)

June 20 - July 2, 2022
Monday - Friday, 9 AM - 4 PM
118 Chambers Building, University Park, PA 16802

Deadline to apply: May 15, 2022

Apply now! >

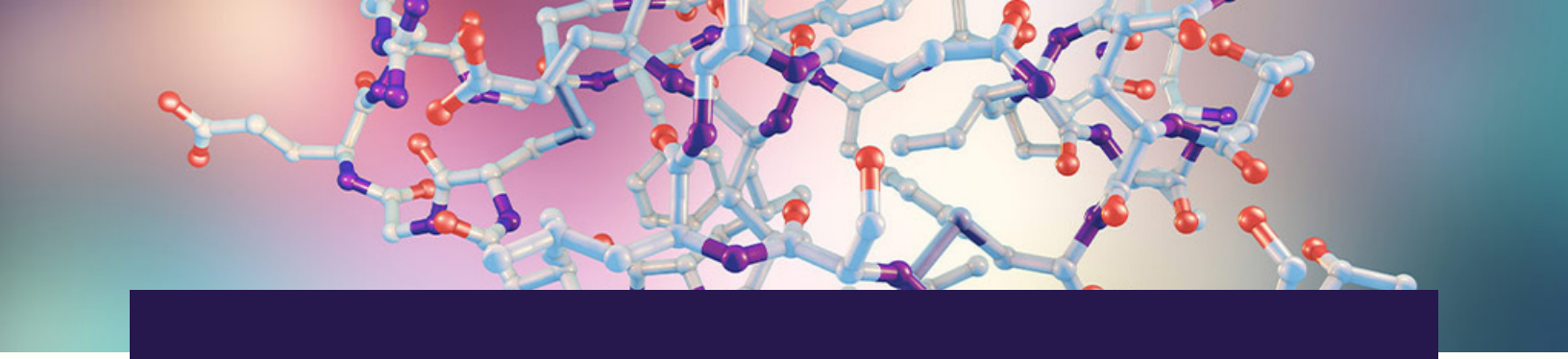
SHAPE MATTERS is a 10-day summer professional development workshop for Pennsylvanian secondary life science and chemistry teachers in collaboration with science education faculty from the Center for Science and the Schools (CSATS) and research scientists from the Penn State College of Medicine and the Eberly College of Science. Teachers will engage in techniques such as crystallization, structure determination, and modeling using the molecular visualization software, Jmol, to explore molecular stories related to human health. Teachers will work with the SHAPE MATTERS team to co-construct a molecular modeling research project for their classroom. The research project will support student participation in the SMART teams program.

Participant Benefits:

- A $600 stipend for participating during the summer
- A $1,500 stipend for implementation of a molecular modeling research project in the classroom
- Over $2,000 of lab and molecular modeling materials for the classroom
- Invitation to bring students to present molecular modeling projects at the SMART teams symposium
- Act 48 credit is available upon request

SEPA SCIENCE EDUCATION PARTNERSHIP AWARD
SUPPORTED BY THE NATIONAL INSTITUTES OF HEALTH

PennState College of Medicine | PennState Eberly College of Science | PennState College of Education | CSATS



Academic Standards

Next Generation Science Standards:

- **HS-LS1-1** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
- **HS-LS1-2** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- **HS-PS1-2** Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
- **HS-PS2-6** Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.

Keystone Eligible Content:

- **BIO.A.2.2.2** Describe how biological macromolecules form from monomers.
- **BIO.A.2.3.2** Explain how factors such as pH, temperature, and concentration levels can affect enzyme function.
- **BIO.B.2.3.1** Describe how genetic mutations alter the DNA sequence and may or may not affect phenotype (e.g., silent, nonsense, frame-shift).

PA Science and Technology Standards:

- **3.3.10.B.** Describe and explain the chemical and structural basis of living organisms.
- **3.4.10.A.** Explain concepts about the structure and properties of matter.
- **3.7.10.A.** Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.