KIT TITLE: Exploring Materials: Graphene **GRADE LEVEL: 5+**

OBJECTIVES:

Students will understand that:

- Graphene is a single layer of carbon atoms arranged in a honeycomb pattern.
- Graphene can be a semi-conductor

NEXT GENERATION SCIENCE STANDARDS

NGSS Performance Tasks	**MS-PS1-1.** • Develop models to describe the atomic composition of simple molecules and extended structures.
NGSS Disciplinary Core Ideas (DSI)	**PS3.A: Definitions of Energy** • Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy.
NGSS Cross Cutting-Concepts (CC)	**CC-3 Scale, Proportion, and Quantity** • Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. **CC-5 Energy and Matter** • Energy cannot be created or destroyed—only moves between one place and another place, between objects and/or fields, or between systems.
NGSS Science and Engineering Practices (SEP)	**SEP 2 – Developing and Using Models** • Develop a model to describe unobservable mechanisms.

COMMON CORE STANDARDS

CC-ELA/Literacy Standards	**RST.6-8.7** • Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-PS1-1)
CC-Math Standards	**MP.2** • Reason abstractly and quantitatively. (MS-PS1-1) **MP.4** • Model with mathematics. (MS-PS1-1)