STEM on an Active Volcano & NGSS and Common Core

STEM on an Active Volcano has been developed to provide teachers with materials that are aligned with the New Generation Science Standards and Common Core mathematics practices.

In particular, STEM on an Active Volcano was developed to provide teachers with a resource that can provide their students with an overview of a 3D approach to many of the Discipline Core Ideas and crosscutting concepts and what STEM career paths are open to people who want to live and work around volcanoes.

NGSS mapping for the project:

Level	Topic	Discipline Core Ideas & Practices
Middle School	History of the Earth	MS-ESS2-2 – Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales MS-ESS2-3 – Analyze and interpret data on the distribution of fossils and rocks, continental shapes and seafloor structures to provide evidence of past plate motions. ESS2-B: Plate Tectonics and large-scale system interactions. Science & Engineering Practices – analyzing and interpreting data. Constructing Explanations and Designing Solutions.
Middle School	Earth's Systems	MS-ESS2-1 – Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. MS-ESS3-1 - Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. Science & Engineering Practices – Developing and Using Models.
Middle School	Weather and Climate	MS-ESS3-5 - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. Crosscutting Concepts – Cause and Effect. Stability and Change Science & Engineering Practices –Asking questions and defining problems

Middle School	Human Impacts	MS-ESS3-2 - Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. ES3. B. Natural Hazards
High School	History of Earth	HS-ESS1-5 - Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. HS-ESS2-1 - Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. Crosscutting Concepts – Stability and Change Science & Engineering Practices – Engaging in Argument from Evidence. *Connections to Nature of Science* - Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena
High School	Earth Systems	HS-ESS2-3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. *Connections to Engineering,Technology,and Applications of Science* • Interdependence of Science, Engineering, and Technology • Influence of Engineering, Technology, and Science on Society and the Natural World *Connections to Nature of Science* - Scientific Knowledge is Based on Empirical Evidence
High School	Weather and Climate	HS-ESS2-4 - Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
High School	Human Sustainability	HS-ESS3-1 - Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

		HS-ESS3-4 - Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. *Connections to Nature of Science* - Science Addresses Questions About the Natural and Material World

Common Core mapping for the project:

Grade	Standard	Topic
Grade 7	CCSS.MATH.CONTENT.7.RP.A.1	Analyze proportional relationships and use them to solve real-world and mathematical problems.
	CCSS.MATH.CONTENT.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.[1]
	CCSS.MATH.CONTENT.7.EE.B.3	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
	CCSS.MATH.CONTENT.7.G.B.4	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
Grade 8	CCSS.MATH.CONTENT.8.G.B.7	Understand and apply the Pythagorean Theorem.
	CCSS.MATH.CONTENT.8.G.C.9	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
High School	CCSS.MATH.CONTENT.HSN.Q.A.1	Reason quantitatively and use units to solve problems.