

HUDSONVILLE HIGH SCHOOL COURSE FRAMEWORK



COURSE / SUBJECT

Geology/ Science

KEY COURSE OBJECTIVES/ ENDURING UNDERSTANDINGS Important ideas and core processes	UNIT PACING Names of units and approximate pacing	UNIT LEARNING TARGETS By the end of the unit, students will be able to...	STANDARD Which standards (i.e. common core, MMC, etc.) does this address?
This two trimester course explores the foundations of geology in the following related topics/fields: Earth's place in the universe, dynamic Earth processes, Energy in the Earth system, Earth's natural resources and their formation, and Michigan geology.	Chemistry and Minerals 2 weeks	<ul style="list-style-type: none"> - know the chemical nature of minerals - understand the mineral subgroups based upon their chemistry - understand chemical bonds - identify, using physical properties and hand specimens in lab, an extensive list of minerals 	E2.2f Explain how elements exist in different compounds and states as they move from one reservoir to another

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	Rocks and the Rock Cycle 3 weeks	<ul style="list-style-type: none"> - understand Bowens Reaction series and how it explains the evolution of magmas - understand how the chemical composition of magma affects the characteristics of that magma - understand the rock cycle and how the characteristics of each rock tells the “story” of the area in which they formed. 	<p>E3.1A Discriminate between igneous, metamorphic, and sedimentary rocks and describe the processes that change one kind of rock into another.</p> <p>E3.1B Explain the relationship between the rock cycle and plate tectonics theory in regard to the origins of igneous, sedimentary, and metamorphic rocks.</p> <p>E3.1c Explain how the size and shape of grains in a sedimentary rock indicate the environment of formation (including climate) and deposition.</p> <p>E3.1d Explain how the crystal sizes of igneous rocks indicate the rate of cooling and whether the rock is extrusive or intrusive.</p> <p>E3.1e Explain how the texture (foliated, nonfoliated) of metamorphic rock can indicate whether it has experienced regional or contact metamorphism.</p>
	Weathering and Erosion 2 weeks	<ul style="list-style-type: none"> - understand how "Weathering" and Earth's external and internal processes are related. - demonstrate how the variables of mechanical and chemical weathering influence the rate of weathering 	<p>E3.p1B Explain how physical and chemical weathering leads to erosion and the formation of soils and sediments.</p>

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	Plate Tectonics 2.5 weeks	<ul style="list-style-type: none"> - Use the evidence of Wegener’s hypothesis of “continental drift” and the breakup of a former supercontinent (Pangaea). - explain how Paleomagnetism led to the revolutionary idea of Plate Tectonics. - explain Earth’s internal heat process and how it is a mechanism of plate movement. - Understand all 3 types of boundaries and the typical Earth features and hazards associated with them 	<p>E2.2A Describe the Earth’s principal sources of internal and external energy (e.g., radioactive decay, gravity, solar energy).</p> <p>E2.2B Identify differences in the origin and use of renewable (e.g., solar, wind, water, biomass) and nonrenewable (e.g., fossil fuels, nuclear [U-235]) sources of energy.</p> <p>E2.2C Describe natural processes in which heat transfer in the Earth occurs by conduction, convection, and radiation.</p>
	Volcanoes and Earthquakes 2.5 weeks	<ul style="list-style-type: none"> - relate the types of volcanoes and earthquakes to the theory of Plate Tectonics - understand the methods of predicting eruptions and earthquakes - report out on how we can mitigate the effects of such disasters 	<p>E3.4A Use the distribution of earthquakes and volcanoes to locate and determine the types of plate boundaries.</p> <p>E3.4B Describe how the sizes of earthquakes and volcanoes are measured or characterized.</p> <p>E3.4C Describe the effects of earthquakes and volcanic eruptions on humans.</p> <p>E3.4d Explain how the chemical composition of magmas relates to plate tectonics and affects the geometry, structure, and explosivity of volcanoes.</p> <p>E3.4e Explain how volcanoes change the atmosphere, hydrosphere, and other Earth systems.</p> <p>E3.4f Explain why fences are offset after an earthquake, using the elastic rebound theory.</p>