North Polk Community Schools Pacing & Course Description Guide

Grade Level: 9, 10	Content: Earth Science	Year: 2022-23

Course Description/Rationale

EARTH SCIENCE (9-12) One Semester **(Required) (RAI)**
This course covers several earth science topics, including astronomy, Earth's structure, natural disasters and their effects on society, weather, and climate. Laboratory study and project-based learning is incorporated to enhance understanding of the concepts.

Name of Unit	Time Frame	Essential Learning Target	Standard(s)
1: Astronomy	4 weeks	Objects in the solar system have predictable movements and lifespans. Meteorites have played a key role in the changing of the surfaces of objects in the solar system	1.1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation. 1.4 Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. 1.6 Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.
2: Plate Tectonics	3 weeks	Mantle convection drives plate tectonics. Plate tectonics has caused many changes to the surface Earth throughout geologic time	1.5 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. 2.1 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. 2.3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
3: Natural Disasters	3 weeks	Plate tectonics has caused many changes to the surface Earth throughout geologic time.	HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and

		Human populations have been affected by natural disasters and climate change throughout geologic time	changes in climate have influenced human activity. HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
Unit 4: Climate and Weather	5 weeks	Availability of natural resources has affected human population and migration patterns throughout geologic time. Water plays an important role in many changes to the Earth's surface. Human impacts have caused many negative consequences for ecosystems around the world. Earth systems, such as the ocean, respond dynamically to negative human impacts. Water plays an important role in many changes to the Earth's surface. Human impacts have caused many negative consequences for ecosystems around the world.	2.2 Analyze geoscience data to make the claim that one change to Earth's surface can create feedback that causes changes to other Earth systems. 3.5 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. 2.4 Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. 3.1 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-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.