EARTH AND SPACE SCIENCES ALTERNATE CONTENT EXPECTATIONS – MIDDLE SCHOOL (GRADES 6-8)

Topic Bundle 1: Space Systems

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.			
EE.MS-ESS1-1: Use a model of the Earth-Sun-Moon system to observe and describe monthly and yearly patterns in the lunar and solar cycle on Earth.	**EE.MS-ESS1-H.1:** Use a model of the Earth-Sun-Moon system to observe and describe monthly and yearly patterns in the lunar and solar cycle on Earth.	**EE.MS-ESS1-M.1:** Use a model to identify monthly and yearly patterns in the lunar and solar cycle on Earth.	**EE.MS-ESS1-L.1:** Use a model to identify daily patterns in the lunar and solar cycles on Earth (differences in daytime and nighttime sky for Sun, moon, and stars).

Topic Bundle 1: Space Systems

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
<td colspan="4">Michigan K-12 Science Content Standard: MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</td>			
EE.MS-ESS1-2: Use models to describe how objects in the solar system (in which Earth is located) pull on each other through gravity, resulting in observable orbits.	**EE.MS-ESS1-H.2:** Use models to describe how objects in the solar system (in which Earth is located) pull on each other through gravity, resulting in observable orbits.	**EE.MS-ESS1-M.2:** Use models to identify that the Sun is the center of the solar system (in which Earth is located) and holds the planets in orbit.	**EE.MS-ESS1-L.2:** Use a model to identify that Earth orbits (goes around) the Sun.

Topic Bundle 1: Space Systems

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.			
EE.MS-ESS1-3: Given scaled models of objects within the solar system in which Earth is located (Sun, Moon, and planets), compare similarities and differences in size.	EE.MS-ESS1-H.3: Given scaled models of objects within the solar system in which Earth is located (Sun, Moon, and planets), compare similarities and differences in size.	EE.MS-ESS1-M.3: Given scaled models of objects in the solar system, (in which Earth is located), identify differences in size.	EE.MS-ESS1-L.3: Given scaled models, identify that the Sun is much larger than Earth.

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Topic Bundle 2: History of Earth

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.			
EE.MS-ESS1-4: Participate in making or using models to explain that Earth's rock layers are very old, and their age is relative to their position within Earth's crust.	EE.MS-ESS1-H.4: Participate in making or using models to explain that Earth's rock layers are very old, and their age is relative to their position within Earth's crust.	EE.MS-ESS1-M.4: Participate in making or using models to identify that rock is formed in layers, and older rock layers are found under younger rock layers.	EE.MS-ESS1-L.4: Use a model of rock layers to identify that layers at the bottom were made first.

Topic Bundle 2: History of Earth

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standards: MS-ESS2-2 and MS-ESS2-3. **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 the past plate motions.			
EE.MS-ESS2-2-3: Use models of Earth's geologic processes to show that Earth's surface changes over time.	**EE.MS-ESS2-H.2-3:** Use models of Earth's geologic processes to show that Earth's surface changes over time.	**EE.MS-ESS2-M.2-3:** Use models to identify evidence that natural processes change Earth's surface through weather, erosion, volcanic eruptions, or earthquakes.	**EE.MS-ESS2-L.2-3:** Given pictures of Earth's surface before and after a natural process occurs, identify which picture shows a change.

Topic Bundle 3: Earth's Systems

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.			
EE.MS-ESS2-1: Use models to describe the three types of rock created by the rock cycle on Earth.	**EE.MS-ESS2-H.1:** Use models to describe the three types of rock created by the rock cycle on Earth.	**EE.MS-ESS2-M.1:** Use models to identify the processes that form different types of rocks.	**EE.MS-ESS2-L.1:** Given a rock with a certain characteristic, identify which rock has the same characteristic.

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Topic Bundle 3: Earth's Systems

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	Medium Range	Low Range
Michigan K-12 Science Content Standard: MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.			
EE.MS-ESS2-4: Use a model to describe how the Sun and gravity move water around Earth and change the form of water in the water cycle (evaporation, condensation, precipitation, and runoff).	EE.MS-ESS2-H.4: Use a model to describe how the Sun and gravity move water around Earth and change the form of water in the water cycle (evaporation, condensation, precipitation, and runoff).	EE.MS-ESS2-M.4: Use a model to show or identify changes in the forms of water in the water cycle (going from solid to liquid to gas) during evaporation or precipitation.	EE.MS-ESS2-L.4: Use a model to identify the form of water (such as, rain, snow, ice, cloud, fog, and steam).

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Topic Bundle 3: Earth's Systems

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	Medium Range	Low Range
Michigan K-12 Science Content Standard: 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.			
EE.MS-ESS3-1: Given data, explain that natural resources used by humans are limited and are found only in certain locations.	EE.MS-ESS3-H.1: Given data, explain that natural resources used by humans are limited and are found only in certain locations.	EE.MS-ESS3-M.1: Identify non-renewable natural resources for familiar functions used by humans (such as soil, minerals – iron, copper, salt, and fossil fuels – coal, gas).	EE.MS-ESS3-L.1: Identify Earth's natural resources used by humans (such as solar, wind, water, metals, soil, fuels).

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Topic Bundle 4: Weather and Climate

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions in Michigan due to the Great Lakes and regional geography.			
EE.MS-ESS2-5: Participate in collecting and/or using data to understand changes in weather conditions in Michigan.	EE.MS-ESS2-H.5: Participate in collecting and/or using data to describe changes in weather conditions in Michigan.	EE.MS-ESS2-M.5: Use data to compare local weather conditions to conditions at a different location occurring at the same time/day.	EE.MS-ESS2-L.5: Identify local weather conditions (such as sunny, snowing, raining, windy, foggy, or thunderstorms).

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Topic Bundle 4: Weather and Climate

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.			
EE.MS-ESS2-6: Use models of the Earth and Sun to show that sunlight hits Earth unevenly making some areas warmer and some colder.	**EE.MS-ESS2-H.6:** Use models of the Earth and Sun to explain that sunlight hits Earth unevenly making the climates of some areas warmer and some colder.	**EE.MS-ESS2-M.6:** Use models of the Earth and Sun to identify that areas near the equator have warmer climates than areas far from the equator.	**EE.MS-ESS2-L.6:** Compare the climate where the student lives and a different climate to identify at least one difference.

Topic Bundle 5: Human Impacts

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standard: 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.			
EE.MS-ESS3-2: Use data to determine if a given natural disaster can be predicted or not by examining patterns.	**EE.MS-ESS3-H.2:** Use data to determine if a given natural hazard can be predicted or not by examining patterns.	**EE.MS-ESS3-M.2:** Identify one or more characteristics of different natural hazards.	**EE.MS-ESS3-L.2:** Identify the safest action to take during a natural hazard that may occur in the student's area.

Topic Bundle 5: Human Impacts

Target Alternate Content Expectation	Michigan Range of Complexity		
	High Range	**Medium Range**	**Low Range**
Michigan K-12 Science Content Standards: MS-ESS3-3, MS-ESS3-4, and MS-ESS3-5. **MS-ESS3-3.** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **MS-ESS3-4.** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. **MS-ESS3-5.** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.			
EE.MS-ESS3-3-4-5: Use data to describe that **increasing human populations and consumption can increase the negative effects on Earth.**	**EE.MS-ESS3-H.3-4-5:** Use data to describe that increasing human populations and consumption can increase the negative effects on Earth.	**EE.MS-ESS3-M.3-4-5:** Identify a harmful effect of human use of resources on Earth (including impacts to food, air, water, and land).	**EE.MS-ESS3-L.3-4-5:** Identify a way that can reduce the negative effects of human use of resources in their daily lives (e.g., turn off water when brushing teeth, turn off electrical appliances when not in use, recycle).