



Park Hill School District

Building Successful Futures • Each Student • Every Day

Middle School 7th Grade Science Curriculum

Course Description: Students will engage in units related to three core areas in science: matter and energy, Earth’s processes, and living things. Throughout the units, students will develop models to describe their learning, construct scientific explanations based on evidence, analyze and interpret data and evidence, and construct, test, and modify a device to illustrate concepts.

Scope and Sequence:

Timeframe	Unit	Instructional Topics
35-40 Days	Physical Science: Bundle 6 Waves and their Applications in Technologies and Information Transfer	Topic 1: Introduction to Properties of Waves Topic 2: Modeling Waves through Various Mediums Topic 3: Properties of Visible Light Topic 4: Modeling Light Waves Topic 5: Digital vs. Analog Signals
25-28 Days	Earth and Space: Bundle 1 The Earth and the Solar System	Topic 1: Earth, Sun, and Moon System Topic 2: The Solar System Topic 3: Formation and Motion of Galaxies
24-28 Days	Earth and Space: Bundle 4 The Role of Water in Earth’s Surface and Weather and Climate	Topic 1: The Water Cycle Topic 2: Predicting Weather Topic 3: Ocean Currents Topic 4: Influences of Climate and Weather
21-27 Days	Earth and Space: Bundle 5 Natural Resources and Human Impacts on Earth Systems	Topic 1: Human Impact on the Environment Topic 2: Human Activities and Global Climate Change

		Topic 3: Human Dependence on Natural Resources
23-27 Days	<p>Life Science: Bundle 4 Inheritance and Variation of Traits</p> <p>Life Science: Bundle 6 Changes in Organisms Over Time</p>	<p>Topic 1: Inheritance and Genetic Variation</p> <p>Topic 2: Natural Selection</p> <p>Topic 3: Artificial Selection</p>

Unit 1

Physical Science: Bundle 6

Waves and their Applications in Technologies and Information Transfer

Subject: Science

Grade: 7th

Name of Unit: Waves and their Applications in Technologies and Information Transfer

Length of Unit: 35-40 days

Overview of Unit: Students will use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. Students will develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Priority Standards for unit:

- 6-8.PS4.A.1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. [Clarification Statement: Emphasis is on describing waves with both qualitative and quantitative thinking.]
- 6-8.PS4.A.2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. [Clarification Statement: Emphasis is on both light and mechanical waves. Examples of models could include drawings, simulations, and written descriptions.]

Supporting Standards for unit:

- 6-8-ESTS-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- ISTE-EMPOWERED LEARNER 1: Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
Mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	Use	Understand	2

A model to describe that waves are reflected, absorbed, or transmitted through various materials.	Develop	Create	3
A model to describe that waves are reflected, absorbed, or transmitted through various materials.	Use	Understand	2

Essential Questions:

1. How would a wave behave when it interacts with a new medium?
2. How do we measure the characteristics of waves?

Enduring Understanding/Big Ideas:

1. A wave will reflect, absorb, or transmit when it interacts with a new medium.
2. A wave can be measured by its frequency, wavelength, and amplitude

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
	Frequency Wavelength Amplitude Wave Reflect Absorb Transmit Mechanical waves Light Digital signals Analog signals

Resources for Vocabulary Development:

- Introduction to Properties of Waves Scope
- Modeling Waves through Various Mediums Scope
- Properties of Visible Light Scope
- Modeling Light Waves
- Digital vs. Analog Signals

Topic 1
Physical Science: Bundle 6
Introduction to Properties of Waves Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
	Read Mission Briefing		First page of Mission Log
6-8.PS4.A.1	Engage: Investigative Phenomena	15	Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.PS4.A.1	Engage: Accessing Prior Knowledge	15	
6-8.PS4.A.1	Engage: Hook - Making Waves		
6-8.PS4.A.1	Explore 1: Activity - Spring Waves	30-45	
6-8.PS4.A.1	Formative: Spring Wave CER		Found within the Explore 1 activity
6-8.PS4.A.1	Explain: <i>Choose activities that connect to Explore 1</i>		
6-8.PS4.A.1	Explore 2: Activity - Patterns in Simple Waves	30-45	
6-8.PS4.A.1	Explain: <i>Choose activities that connect to Explore 2</i>		
6-8.PS4.A.1	Explore 3: Spinning & Strumming...Sound Energy!	60-120	
6-8.PS4.A.1	Explain: <i>Choose activities that connect to Explore 3</i>		
6-8.PS4.A.1	Engage: Graphic Organizer		

6-8.PS4.A.1	Elaborate: <i>Choose from activities</i>		
6-8.PS4.A.1	Complete page 2 of Mission Log: Introduction to Properties of Waves		
6-8.PS4.A.1	Evaluate: <i>Choose from activities</i>		

Topic 2
Physical Science: Bundle 6
Modeling Waves Through Various Mediums Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.PS4.A.2	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.PS4.A.2	Engage: Accessing Previous Knowledge		
6-8.PS4.A.2	Engage: Hook		
6-8.PS4.A.2	Explore 1 Activity: Visualizing Sound	30-45	
6-8.PS4.A.2	Explain: <i>Choose Activities that connect to Explore 1</i>		
6-8.PS4.A.2	Explore 2: The Sounds of Science	30-45	
6-8.PS4.A.2	Explain: <i>Choose Activities that connect to Explore 2</i>		
6-8.PS4.A.2	Elaborate: Reading Science: Supersonic Ships?		
6-8.PS4.A.2	Explore 3: Research- Geologists and Waves	60-120	
6-8.PS4.A.2	Engage: Graphic Organizer		
6-8.PS4.A.2	Elaborate: Science Today- Watch It!		
6-8.PS4.A.2	Evaluate: Claim Evidence Reasoning		

6-8.PS4.A.2	Update complete page 3 of Mission Log: Modeling Waves through Various Mediums		
6-8.PS4.A.2	Choose: Open ended Response Assessment or Multiple Choice Assessment		

Topic 3
Physical Science: Bundle 6
Properties of Visible Light Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.PS4.A.2	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.PS4.A.2	Engage: Accessing Prior Knowledge		
6-8.PS4.A.2	Engage: Hook - Laser Light Maze	15-30	Suggested to complete as a demo
6-8.PS4.A.2	Explore 1: Activity - Simulating Light	15-30	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 1</i>		
6-8.PS4.A.2	Explore 2: Activity - What Color is That?	30-45	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 2</i>		
6-8.PS4.A.2	Explore 3: Scientific Investigation - Interactions of Light Waves	30-45	
6-8.PS4.A.2	Formative: Interactions of Light Waves CER		Found within the Explore 3 activity
6-8.PS4.A.2	Explore 4: Engineering Solution - Lights Out	120-180	

6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 4</i>		
6-8.PS4.A.2	Explore 5: Tuva - How Do Different Materials Affect Light Waves?	30-45	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 5</i>		
6-8.PS4.A.2	Engage: Graphic Organizer		
6-8.PS4.A.2	Elaborate: <i>Choose from activities</i>		
6-8.PS4.A.2	Complete page 4 of Mission Log: Properties of Visible Light		
6-8.PS4.A.2	Evaluate: <i>Choose from activities</i>		

Topic 4
Physical Science: Bundle 6
Modeling Light Waves Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.PS4.A.2	Engage: Investigative Phenomena		
6-8.PS4.A.2	Engage: Accessing Prior Knowledge		
6-8.PS4.A.2	Engage: Hook - Laser Light Maze	15-30	Suggested to complete as a demo
6-8.PS4.A.2	Explore 1: Activity - Frequency and Refraction	30-45	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 1</i>		
6-8.PS4.A.2	Explore 2: Scientific Investigation: Brightness	30-45	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 2</i>		
6-8.PS4.A.2	Elaborate: Reading Science- The Electromagnetic Spectrum with Engage: Graphic Organizer		
6-8.PS4.A.2	Evaluate: Claim Evidence Reasoning		May be used as a formative assessment
6-8.PS4.A.2	Elaborate: Career Connections-Eye Doctor		
6-8.PS4.A.2	Elaborate: Science Today-Watch It!- Eye Diseases		
6-8.PS4.A.2	Elaborate: Cow's Eye Dissection	80	

6-8.PS4.A.2	Update complete page 5 of Mission Log: Modeling Light Waves		
6-8.PS4.A.2	Evaluate: Open ended Response and Multiple Choice Response Assessments		

Topic 5
Physical Science: Bundle 6
Digital vs. Analog Signals Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.PS4.A.2	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.PS4.A.2	Engage: Accessing Prior Knowledge		
6-8.PS4.A.2	Engage: Hook - From Analog to Digital		
6-8.PS4.A.2	Explore 1: Activity - Modeling Digital Signals	30-45	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 1</i>		
6-8.PS4.A.2	Explore 2: Activity - Why are Digitized Signals More Reliable?	120-180	
6-8.PS4.A.2	Explain: <i>Choose activities that connect to Explore 2</i>		
6-8.PS4.A.2	Engage: Graphic Organizer		
6-8.PS4.A.2	Elaborate: <i>Choose from activities</i>		
6-8.PS4.A.2	Complete page 6 of Mission Log: Digital vs. Analog Signals		
6-8.PS4.A.2	Evaluate: <i>Choose from activities</i>		

Engaging Scenario

Engaging Scenario (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Complete the Action Plan for the Physical: Bundle 6: Waves and their Applications in Technologies and Information Transfer

Unit 2

Earth and Space: Bundle 1

The Earth and the Solar System

Subject: Science

Grade: 7th

Name of Unit: The Earth and the Solar System

Length of Unit: 25-28 days

Overview of Unit: This unit focuses on the role of gravity on the motions of objects in our solar system and galaxy. Another focus is on the cyclic patterns caused by the interactions of the Sun, Earth, and Moon.

Priority Standards for unit:

- 6-8-ESS1.A.3 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. [Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical or conceptual.]
- 6-8-PS2.B.2 Create and analyze a graph to use as evidence to support the claim that gravitational interactions depend on the mass of interacting objects. [Clarification Statement: Examples of evidence for arguments could include data generated from simulations or digital tools; and charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system.]
- 6-8-ESS1.B Analyze and interpret data to determine scale properties of objects in the solar system. [Clarification Statement: Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models.]
- 6-8 .ESS1.A.1 Develop and use a model of the Earth-sun-moon system to explain the cyclic patterns of lunar phases and eclipses of the sun and moon. [Clarification Statement: Examples of models can be physical, graphical, or conceptual and should emphasize relative positions and distances.]
- 6-8-ESS1.A.2 Develop and use a model of the Earth-sun system to explain the cyclical pattern of seasons, which includes the Earth's tilt and directional angle of sunlight on different areas of Earth across the year. [Clarification Statement: Examples of models can be physical, graphical, or conceptual.]

Supporting Standards for unit:

- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
The role of gravity in the motions within galaxies and the solar system.	Develop	Create	3
The role of gravity in the motions within galaxies and the solar system.	Use	Understand	2
Gravitational interactions depend on the mass of interacting objects.	Create	Create	3
Gravitational interactions depend on the mass of interacting objects.	Analyze	Analyze	4
Determine scale properties of objects in the solar system.	Analyze	Analyze	3
Determine scale properties of objects in the solar system.	Interpret	Interpret	3
Explain the cyclic patterns of lunar phases and eclipses of the sun and moon.	Develop	Create	3
Explain the cyclic patterns of lunar phases and eclipses of the sun and moon.	Use	Understand	2
Explain the cyclical pattern of seasons, which includes the Earth's tilt and directional angle of sunlight on different areas of Earth across the year.	Develop	Create	3
Explain the cyclical pattern of seasons, which includes the Earth's tilt and directional angle of sunlight on different areas of Earth across the year.	Use	Understand	2

Essential Questions:

1. How would the solar system be affected if the Sun were bigger? What if the Sun were smaller?
2. How do the planets stay in orbit?
3. How do we use scale models?
4. Why do lunar phases and eclipses occur?
5. Why do we have seasons?

Enduring Understanding/Big Ideas:

1. The mass of an object determines its strength of gravitational interaction, its distance from the Sun, and orbital periods.
2. The orbital path of an object is determined by its gravitational pull, centripetal forces, and inertia.
3. A scale model is a physical representation of an object, which maintains accurate relationships between all important aspects of the model to observe or demonstrate the properties of the original object without examining the original object itself.
4. The Earth-sun-moon system goes through cyclic patterns to create lunar phases and eclipses.
5. The Earth's tilt and directional angle of sunlight on different areas of Earth across the year create seasons.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
	Rotation Revolution Axis Celestial body Electromagnetic spectrum Gravity Galaxy Centripetal force Inertia Solar system Orbit Lunar phases Eclipses Seasons Earth's tilt Terrestrial Ellipse Astronomical Unit

Resources for Vocabulary Development:

- The Solar System Scope
- Formatting the Solar System Scope
- The Universe Scope
- Gravitational Forces Scope
- Patterns of Motion Scope
- Earth, Sun, and Moon Systems Scope

Topic 1
Earth and Space: Bundle 1
Earth, Sun, and Moon System Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8 .ESS1.A.1	Read Mission Briefing	10-15	Introduces mission for the unit
6-8 .ESS1.A.1	Engage: Investigative Phenomena	15	Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8 .ESS1.A.1	Engage: Accessing Prior Knowledge	15	
6-8 .ESS1.A.1	Engage: Hook	15-30	
6-8 .ESS1.A.1	Explore 1: Activity - Lunar Cycle	60-120	
6-8 .ESS1.A.1	Evaluate: CER	30	Can be used as a formative assessment
6-8 .ESS1.A.1	Explain: <i>Choose activities connected to Explore 1</i>		
6-8 .ESS1.A.1	Engage: Investigative Phenomena	15	Students complete the Investigative Phenomena Table
6-8 .ESS1.A.2	Explore 2: Activity - Seasonal Tilt & Whirl	30-45	
6-8 .ESS1.A.2	Scope 2.0 - Earth, Sun, and Moon Scope Explore: Do 3 - The Sun's Warming Power	60-120	

6-8 .ESS1.A.2	Scope 2.0 - Earth, Sun, and Moon Scope Explore: Do 4 - Day Length and Seasons	60-120	
6-8 .ESS1.A.2	Explain: <i>Choose activities connected to Explore 2</i>		
6-8 .ESS1.A.2	Evaluate: Open-Ended Response Assessment		Can be used as a formative assessment.
6-8 .ESS1.A.1	Explore 3: Activity - Eclipses	30-45	
6-8 .ESS1.A.1	Explain: <i>Choose activities connected to Explore 3</i>		
6-8 .ESS1.A.1 & 6-8 .ESS1.A.2	Explore 4: Tuva - Cycles of Moon, Earth, and Sun	30-45	
6-8 .ESS1.A.1 & 6-8 .ESS1.A.2	Engage: Graphic Organizer - Patterns in a System		
6-8 .ESS1.A.1 & 6-8 .ESS1.A.2	Explain: <i>Choose activities connected to Explore 4</i>		
6-8 .ESS1.A.1 & 6-8 .ESS1.A.2	Elaborate: <i>Choose from activities</i>		
6-8 .ESS1.A.1 & 6-8 .ESS1.A.2	Complete page 2 of the Mission Log: Earth, Sun, and Moon System		
6-8 .ESS1.A.1 & 6-8 .ESS1.A.2	Evaluate: Multiple Choice Assessment		

Topic 2
Earth and Space: Bundle 1
The Solar System Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.ESS1.A.3	Engage: Investigative Phenomena	15	Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.ESS1.A.3	Engage: Accessing Prior Knowledge	15	
6-8.ESS1.A.3	Engage: Hook - Bella Luna	15-30	
6-8.ESS1.B	Explore 1: Activity - Our Solar System	60-120	
6-8.ESS1.B	Explain: <i>Choose activities connected to Explore 1</i>		
6-8.ESS1.A.3	Explore 2: Activity - Gravity	30-45	
6-8.ESS1.A.3	Explain: <i>Choose activities connected to Explore 2</i>		
6-8.ESS1.A.3	Explore 3: Inquiry Investigation - Investigating Orbits	60-120	
6-8.ESS1.A.3	Explain: <i>Choose activities connected to Explore 3</i>		
6-8-PS2.B.2 & 6-8.ESS1.B	Explore 4: Tuva -- Planets - Giants and Dwarfs	30-45	
6-8-PS2.B.2 & 6-8.ESS1.B	Formative: Planets - Giants and Dwarfs CER		Located within the Explore 4 activity

6-8-ESS1.B	Explore 5: Research - Comparing Solar System Objects at Different Scales	120-180	
6-8-ESS1.B	Engage: Graphic Organizer- A Model of Our Solar System		
6-8-ESS1.B	Elaborate: <i>Choose from activities</i>		
	Complete page 3 of the Mission Log: Solar System		
6--8-ESS1.B	Evaluate: <i>Choose from activities</i>		

Topic 3
Earth and Space: Bundle 1
Formation and Motion of Galaxies Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
8.ESS1.A.3	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
8.ESS1.A.3	Engage: Accessing Prior Knowledge		
8.ESS1.A.3	Engage : Hook		
8.ESS1.A.3	Explore: Do 2 Activity: Gravity's Pull	30-45	Do not complete Explore 1 which is NOT in Missouri's standards
8.ESS1.A.3	Explain: Picture Vocabulary and/or Explain: Content Connections video- The Birth of our Solar System		This includes a slide on the Big Bang Theory which is NOT in Missouri's standards
8.ESS1.A.3	Elaborate- Science today- Read it!		
8.ESS1.A.3	Explore 3 Activity- To the Milky Way and Beyond!	30-45	Can include Engage: Graphic Organizer

8.ESS1.A.3	Explain: STEMScopedia	20-30	Second half of the article deals with stars, solar systems and galaxies.
8.ESS1.3.A	Evaluate: Open Ended Response	30-45	Can be used as a formative assessment during unit instead of at end
8.ESS1.3.A	Evaluate: Claim Evidence Reasoning and/or.....		
8.ESS1.3.A	Evaluate: Multiple Choice Assessment		
	Complete page 4 of Mission Log: Formation and Motion of Galaxies		

Engaging Scenario

Engaging Scenario (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Complete the Action Plan for the Earth & Space Bundle 1: The Earth and the Solar System

Unit 3

Earth and Space: Bundle 4

The Role of Water in the Earth's Surface, and Weather and Climate

Subject: Science

Grade: 7th

Name of Unit: Weather

Length of Unit: 24-28 days

Overview of Unit: This unit focuses on the flow of energy and water throughout Earth's hydrosphere. Students will model the water cycle and atmospheric and oceanic circulations plus research and demonstrate the interactions of air masses resulting in weather changes.

Priority Standards for unit:

- 6-8 .ESS2.C.1 Design and develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. [Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.]
- 6-8 .ESS2.C.3 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. [Clarification Statement: Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight driven latitudinal banding, the Coriolis Effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis Effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.]
- 6-8.ESS2.C.2 Research, collect, and analyze data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. [Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within possible ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).]

Supporting Standards for unit:

- ASD #9-Students will respond to diversity by building empathy, respect, understanding, and connection

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
The cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	Design	Create	1
The cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	Develop	Create	3
Unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	Use	Understand	2
The motions and complex interactions of air masses results in changes in weather conditions.	Analyze	Analyze	3

Essential Questions:

1. How does water move from one area to another?
2. How do meteorologists predict weather?
3. Why would the temperatures on the same latitude be different in different parts of the world?
4. Why is there a Coriolis Effect?

Enduring Understanding/Big Ideas:

1. Meteorologists research, collect, and analyze data to provide evidence for the interaction of air masses.
2. The cycling of water through Earth's systems is driven by energy from the sun and the force of gravity.
3. The unequal heating and rotation of the Earth cause atmospheric and ocean circulation that determine regional climates.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
	Visualizations Rotation Oceanic circulation Regional climates Coriolis effect Prevailing winds Convection Radiation Conduction Air masses Air pressure Humidity Precipitation Hydrologic cycle

Resources for Vocabulary Development:

Water on Earth Scope

Influences on Weather and Climate Scope

Oceans Influence on Weather and Climate Scope

Water in the Atmosphere Scope

Predicting Weather Scope

Water Cycle Scope

Topic 1
Earth and Space: Bundle 4
The Water Cycle Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
	Mission Briefing		On Bundle Resources link. Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
8.ESS2.C.1	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
8.ESS2.C.1	Engage: Accessing Prior Knowledge		
8.ESS2.C.1	Engage: Hook		
8.ESS2.C.1	Explore 1 Activity: Water in The Atmosphere	60-120	A lot of storage space with grow lights needed
8ESS2.C.1	Choose From: Explain: Linking Literacy or Explain: STEMScopedia		STEMScopedia: You might want to set up the Try Now the day before
8ESS2.C.1	Elaborate: Reading Science- the Water Cycle AND Engage- Graphic Organizer		

8ESS2.C.1	Evaluate: Claim Evidence Reasoning		Can be used as a formative assessment
8ESS2.C.1	Explore 2 Activity: Water Cycle Journey	60-120	
8ESS2.C.1	Complete page 2 of the Mission Log: Water Cycle		
8ESS2.C.1	Evaluate: Open Ended Response Assessment and Evaluate: Multiple Response Assessment		

Topic 2
Earth and Space: Bundle 4
Predicting Weather Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
8.ESS2.C.2	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
8.ESS2.C.2	Engage: Accessing Prior Knowledge		
8.ESS2.C.2	Engage: Hook		
8.ESS2.C.2	Explore 1 Activity: Forecast for Omaha	60-120	
8.ESS2.C.2	Explain: Picture Activity		
8.ESS2.C.2	Explore 2 Activity: Probability and Prediction	60-120	
8.ESS2.C.2	Elaborate: Reading Science- Meteorologists		
8.ESS2.C.2	Explore 3 Activity: Weather Factors	60-120	
8.ESS2.C.2	Elaborate: Science Today- Watch It!	15	
8.ESS2.C.2	Explore 4 Activity: The Effect of Landforms on Weather	60-120	
8.ESS2.C.2	Choose from: Linking Literacy or STEMScopedia		
8.ESS2.C.2	Explore 5 Activity: Ocean Currents and Weather Patterns	60-120	

8.ESS2.C.2	Engage: Graphic Organizer		
8.ESS2.C.2	Update page 3 of Mission Log: Predicting Weather		
8.ESS2.C.2	Evaluate: Open Ended Response Assessment and Multiple Choice assessment		

Topic 3
Earth and Space: Bundle 4
Ocean Currents Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
8.ESS2.C.3	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
8.ESS2.C.3	Engage: Accessing Prior Knowledge		
8.ESS2.C.3	Engage: Hook		
8.ESS2.C.3	Explore: 1 Activity: Deep Ocean Currents	30-45	
8.ESS2.C.3	Explain: Choose Activities connected to Explore 1		
8.ESS2.C.3	Elaborate: Reading Science- The Ocean Conveyor Belt		
8.ESS2.C.3	Explore 2: Scientific Investigation: Influences on Our Weather and Climate	30-60	
8.ESS2.C.3	Explain: Choose Activities connected to Explore 2		
8.ESS2.C.3	Elaborate: Science Today- Watch It!	15	
	Engage: Graphic Organizer		
8.ESS2.C.3	Complete page 4 of Mission Log: Ocean Currents		

8.ESS2.C.3	Evaluate: Open Ended Answer Assessment and Evaluate: Multiple Choice Assessment		
-------------------	--	--	--

Topic 4
 Earth and Space: Bundle 4
 Influences of Climate and Weather Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
8.ESS2.C.3	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
8.ESS2.C.3	Engage: Accessing Prior Knowledge		
8.ESS2.C.3	Engage: Hook		
8.ESS2.C.3	Explore 1: Activity- Intensity of Light and Moving air	60-120	
8.ESS2.C.3	Explain: Choose Activities connected to Explore 1		
8.ESS2.C.3	Explore 2: Scientific Investigations- Ocean Surface currents	60-120	
8.ESS2.C.3	Explain: Choose Activities connected to Explore 2		
8.ESS2.C.3	Explore 3: Scientific Investigations-	60-120	
8.ESS2.C.3	Elaborate: Reading Science- Why Do Different Areas Have Different Climates?		
8.ESS2.C.3	Evaluate- Claim Evidence Reasoning		
8.ESS2.C.3	Engage: Graphic Organizer		

8.ESS2.C.3	Complete page 5 of Mission Log: Influences of Weather and Climate		
8.ESS2.C.3	Evaluate: Multiple Choice Assessment		

Engaging Scenario

Engaging Scenario (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Complete the Action Plan for the Earth & Space Bundle 4: The Role of Water in the Earth's Surface, and Weather and Climate

Unit 4

Earth and Space: Bundle 5

Natural Resources and Human Impacts on Earth Systems

Subject: Science

Grade: 7th

Name of Unit: Human Impact on Earth System

Length of Unit: 21-27 days

Overview of Unit: Students will research the long term causes and effects of global temperature changes.

Priority Standards for unit:

- 6-8.ESS3.D Analyze evidence of the factors that have caused the change in global temperatures over the past century. (Clarification Statement: Examples of factors include human activities (such as fossil fuel combustion, cement production, and agricultural activity) and natural processes (such as changes in incoming solar radiation or volcanic activity). Examples of evidence can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and met the rates of human activities.)

Supporting Standards for unit:

- ASD #9-Students will respond to diversity by building empathy, respect, understanding, and connection

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
The change in global temperatures over the past century.	Analyze	Analyze	3

Essential Questions:

1. How has global warming had an impact on sea levels?

Enduring Understanding/Big Ideas:

1. Human activities and natural processes have affected global temperatures over the past century.
2. Human activities and natural processes have affected sea levels over the past century.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
	Global temperatures Fossil fuels Combustion

Resources for Vocabulary Development:

- Human Impact on the Environment
- Human Activities and Global Climate Change Scope
- Human Dependence on Natural Resources

Topic 1
Earth and Space: Bundle 5
Human Impact on the Environment Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.ESS3.D	Read Mission Briefing	10-15	
6-8.ESS3.D	Engage: Investigative Phenomena	10-15	Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.ESS3.D	Engage: Accessing Prior Knowledge	15	
6-8.ESS3.D	Engage: Hook - Effect of Human Activities	15-30	
6-8.ESS3.D	Explore 1: Tuva - Air Pollution and Human Population	30-45	
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 1</i>		
6-8.ESS3.D	Evaluate: CER		Can be used as a formative assessment
6-8.ESS3.D	Explore 2: Scientific Investigation - Ocean Acidification	120-180	
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 2</i>		
6-8.ESS3.D	Formative: Ocean Acidification CER		Located within the Explore 2 activity
6-8.ESS3.D	Explore 3: Engineering Solution - Protect and Monitor	120-180	

6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 3</i>		
6-8.ESS3.D	Engage: Graphic Organizer		
6-8.ESS3.D	Elaborate: <i>Choose from activities</i>		
6-8.ESS3.D	Complete page 2 Mission Log: Human Impact on the Environment		
6-8.ESS3.D	Evaluate: <i>Choose from activities</i>		

Topic 2
 Earth and Space: Bundle 5
 Human Activities and Global Climate Change Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.ESS3.D	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.ESS3.D	Engage: Accessing Prior Knowledge		
6-8.ESS3.D	Engage: Hook - Arctic Sea Ice	30-45	
6-8.ESS3.D	Explore 1: Activity - Climate Science	120-180	
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 1</i>		
6-8.ESS3.D	Explore 2: Tuva - Global Climate Change	30-45	
6-8.ESS3.D	Formative: Global Climate Change CER		Located within the Explore 2 activity
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 2</i>		
6-8.ESS3.D	Explore 3: Research - Human Activity Causes and Solutions	60-120	
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 3</i>		
6-8.ESS3.D	Engage: Graphic Organizer		

6-8.ESS3.D	Elaborate: <i>Choose from activities</i>		
6-8.ESS3.D	Complete page 3 of Mission Log: Human Activities and Global Climate Change		
6-8.ESS3.D	Evaluate: <i>Choose from activities</i>		

Topic 3
 Earth and Space: Bundle 5
 Human Dependence on Natural Resources Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.ESS3.D	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.ESS3.D	Engage: Accessing Prior Knowledge		
6-8.ESS3.D	Engage: Hook - Renewable or Nonrenewable?	15-30	
6-8.ESS3.D	Explore 1: Activity - It's Not Renewable? So What?	30-45	
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 1</i>		
6-8.ESS3.D	Explore 2: Research - How Was It Formed? Where Is It Located? How Do We Use It?	120-180	
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 2</i>		
6-8.ESS3.D	Explore 3: Activity - Use and Consequences Game	60-120	
6-8.ESS3.D	Formative: Use and Consequences CER		Located within the Explore 3 activity
6-8.ESS3.D	Explain: <i>Choose activities connected to Explore 3</i>		

6-8.ESS3.D	Explore 4: Tuva - Earth's Overdrawn Account	30-45	
6-8.ESS3.D	Explain: <i>Choose from activities connected to Explore 4</i>		
6-8.ESS3.D	Engage: Graphic Organizer		
6-8.ESS3.D	Elaborate: <i>Choose from activities</i>		
6-8.ESS3.D	Complete page 4 of Mission Log: Human Dependence on Natural Resources		
6-8.ESS3.D	Evaluate: <i>Choose from activities</i>		

Engaging Scenario

Engaging Scenario (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Complete the Action Plan for the Earth & Space Bundle 5: Natural Resources and Human Impacts on Earth Systems

Unit 5
Life: Bundle 4
Inheritance and Variation of Traits
Life: Bundle 6
Changes in Organisms Over Time

Subject: Science

Grade: 7th

Name of Unit: Inheritance and Variation of Traits

Length of Unit: 23-27 days

Overview of Unit: This unit focuses on the survival of individuals due to genetic variation, including natural selection and human technologies.

Priority Standards for unit:

- 6-8.LS4.B.1 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. [Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.]
- 6-8.LS4.B.2 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. [Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, and farming practices).]
- 6-8.LS4.C Interpret graphical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Supporting Standards for unit:

- 6-8-ETS-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- ASD #9- Students will respond to diversity by building empathy, respect, understanding, and connection

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
Genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	Construct	Understand	3
Technologies that have changed the way humans influence the inheritance of desired traits in organisms	Gather	Understand	2
Technologies that have changed the way humans influence the inheritance of desired traits in organisms	Synthesize	Create	3 (one source) 4 (multiple sources)
Natural selection may lead to increases and decreases of specific traits in populations over time.	Interpret	Analyze	3

Essential Questions:

1. How do genetic variations increase the probability of survival?
2. How does technology influence inheritance of traits?
3. How does natural selection lead to the increase or decrease of specific traits?

Enduring Understanding/Big Ideas:

1. The proportion of individual organisms that have genetic variations and traits that are advantageous in a particular environment will increase from generation to generation due to natural selection because the probability that those individuals will survive and reproduce is greater.
2. The uses of artificial selection such as genetic modification, animal husbandry, and farming practices have influenced the inheritance of desired traits.
3. The process of natural selection allows favorable traits become more common and less favorable traits become less common in following generations.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Specific environment Probability Population Vocalization	Heredity Inheritance Genetic variation Natural selection Trait Organism Genetic outcome Artificial selection Genetic modification Animal husbandry Herding Breeding Seed germination Genetic factors Fertilizer

Resources for Vocabulary Development:

Inheritance and Genetic Variation
Natural Selection
Artificial Selection

Topic 1
Life: Bundle 4
Inheritance and Genetic Variation Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
This is the only Scope that you will complete from Bundle 4.			
6-8.LS4.B.1	Engage: Investigative Phenomena	10-15	Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.LS4.B.1	Engage: Accessing Prior Knowledge	15	
6-8.LS4.B.1	Engage: Hook - Where Did It Come From?	15-30	
6-8.LS4.B.1	Explore 1: Activity - Where Did They Get Those Traits?	60-120	
6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 1</i>		
6-8.LS4.B.1	Explore 2: Activity - Genetic Variation in Monsters	60-120	
6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 2</i>		
6-8.LS4.B.1	Explore 3: Activity - Use a Punnett Square	60-120	
6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 3</i>		
6-8.LS4.B.1	Formative: Evaluate: CER		

6-8.LS4.B.1	Explore 4: Activity - Asexual Reproduction	60-120	
6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 4</i>		
6-8.LS4.B.1	Formative: Asexual Reproduction CER		Located within the Explore 4 activity
6-8.LS4.B.1	Engage: Graphic Organizer		
6-8.LS4.B.1	Elaborate: <i>Choose from activities</i>		
6-8.LS4.B.1	Evaluate: Choose Open-Ended Response and/ or Multiple Choice Assessment		

Topic 2
Life: Bundle 6
Natural Selection Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
	Read Mission Briefing		Found on pg. 1 of Mission Log
6-8.LS4.C	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.LS4.C	Engage: Accessing Prior Knowledge		
6-8.LS4.C	Engage: Hook - Conditions for Natural Selection	15-30	
6-8.LS4.C	Explore 1: Activity - Survival of the Fittest	60-120	
6-8.LS4.C	Formative: Survival of the Fittest CER		Found within the Explore 1 activity
6-8.LS4.C	Explain: <i>Choose from activities connected to Explore 1</i>		
6-8.LS4.C	Explore 2: Activity - The Finches of Daphne Island	60-120	
6-8.LS4.C	Explain: <i>Choose from activities connected to Explore 2</i>		
6-8.LS4.B.1	Explore 3: Activity - Genetic Variations and Survival	30-45	

6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 3</i>		
6-8.LS4.B.1	Explore 4: Activity - Adaptations for Survival	60-120	
6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 4</i>		
6-8.LS4.B.1	Explore 5: Galapagos Finch Population and Seed Counts	30-45	
6-8.LS4.B.1	Explain: <i>Choose activities connected to Explore 5</i>		
6-8.LS4.C & 6-8.LS4.B.1	Engage: Graphic Organizer		
6-8.LS4.C & 6-8.LS4.B.1	Elaborate: <i>Choose from activities</i>		
6-8.LS4.C & 6-8.LS4.B.1	Complete page 2 of Mission Log: Natural Selection		
6-8.LS4.C & 6-8.LS4.B.1	Evaluate: <i>Choose from activities</i>		

Topic 3
Life: Bundle 6
Artificial Selection Scope

Standard	Topic & Section	Suggested # of Minutes	Notes
6-8.LS4.B.2	Engage: Investigative Phenomena		Complete Before Instruction column and then revisit throughout topic to complete During and After Instruction columns.
6-8.LS4.B.2	Engage: Accessing Prior Knowledge		
6-8.LS4.B.2	Engage: Hook - How Did We Get Here?	15-30	
6-8.LS4.B.2	Explore 1: Activity - Artificially Selecting Dogs	60-120	
6-8.LS4.B.2	Explain: <i>Choose activities that connect to Explore 1</i>		
6-8.LS4.B.2	Explore 2: Research - Human Influence on Desired Traits	120-180	
6-8.LS4.B.2	Formative: Human Influence on Desired Traits CER		Included within the Explore 2 activity
6-8.LS4.B.2	Explain: <i>Choose activities that connect to Explore 2</i>		
6-8.LS4.B.2	Engage: Graphic Organizer		
6-8.LS4.B.2	Elaborate: <i>Choose from activities</i>		
6-8.LS4.B.2	Complete page 3 of the Mission Log: Artificial Selection		
6-8.LS4.B.2	Evaluate: <i>Choose from activities</i>		

Engaging Scenario

Engaging Scenario (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Complete the Action Plan for the Life Bundle 6: Changes in Organisms Over Time

Unit of Study Terminology

Appendices: All Appendices and supporting material can be found in this course's shell course in the District's Learning Management System.

Assessment Leveling Guide: A tool to use when writing assessments in order to maintain the appropriate level of rigor that matches the standard.

Big Ideas/Enduring Understandings: Foundational understandings teachers want students to be able to discover and state in their own words by the end of the unit of study. These are answers to the essential questions.

Engaging Experience: Each topic is broken into a list of engaging experiences for students. These experiences are aligned to priority and supporting standards, thus stating what students should be able to do. An example of an engaging experience is provided in the description, but a teacher has the autonomy to substitute one of their own that aligns to the level of rigor stated in the standards.

Engaging Scenario: This is a culminating activity in which students are given a role, situation, challenge, audience, and a product or performance is specified. Each unit contains an example of an engaging scenario, but a teacher has the ability to substitute with the same intent in mind.

Essential Questions: Engaging, open-ended questions that teachers can use to engage students in the learning.

Priority Standards: What every student should know and be able to do. These were chosen because of their necessity for success in the next course, the state assessment, and life.

Supporting Standards: Additional standards that support the learning within the unit.

Topic: These are the main teaching points for the unit. Units can have anywhere from one topic to many, depending on the depth of the unit.

Unit of Study: Series of learning experiences/related assessments based on designated priority standards and related supporting standards.

Unit Vocabulary: Words students will encounter within the unit that are essential to understanding. Academic Cross-Curricular words (also called Tier 2 words) are those that can be found in multiple content areas, not just this one. Content/Domain Specific vocabulary words are those found specifically within the content.

Symbols:



This symbol depicts an experience that can be used to assess a student's 21st Century Skills using the rubric provided by the district.



This symbol depicts an experience that integrates professional skills, the development of professional communication, and/or the use of professional mentorships in authentic classroom learning activities.