

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Introduction to Earth's Systems

Time Allotment: 14 days

Unit Sequence: 1

Major Concepts to be learned:

- What are the different components of the Earth system?
- What are the sources of energy for the processes that affect Earth?
- How can you model the cycling of matter in the Earth system?
- What are the different landforms found on Earth?
- What forces and energy make the different landforms?
- What are the various ways to model landforms?
- Where and in what features is water found on Earth?
- How does water cycle through Earth's systems?

Expected Skills to be demonstrated:

- Students will develop and use models to demonstrate how a system returns information about itself, and that information results in change
- Students will develop and use models to demonstrate how computers create topographic and other maps to model Earth's landforms.
- Students will develop and use models to demonstrate the water cycle.

PA Standards/Anchors:

Eligible Content:

3.3.6-8.E, F

MS-ESS2-1
MS-ESS2-4

Instructional Strategies:

Assessments:

- Problem solving activities
- Lecture
- Written work
- Hands-on activity
- Note Taking
- Evaluating

- Chapter 1 Quiz
- Chapter 1 Test
- Notebook - notes and vocabulary

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Weather in Atmosphere

Time Allotment: 19 days

Unit Sequence: 2

Major Concepts to be learned:

- What is the composition and structure of Earth's atmosphere?
- How does energy from the sun affect Earth's atmosphere?
- What processes make up the water cycle?
- How does energy drive the processes of the water cycle?
- How does the water cycle affect weather?
- How do global patterns affect air masses, air masses form fronts, and interactions of air masses change the weather?
- How do weather maps help to model current weather and predict future weather?

Expected Skills to be demonstrated:

- Students will identify and synthesize data to construct an explanation of the structure and layers of Earth's atmosphere.
- Predict the stability and change caused by unequal heating of Earth's atmosphere by the sun
- Analyze and interpret data to describe evidence that water vapor enters the atmosphere through several processes, water is continually evaporating and condensing to form clouds, and precipitation is a vital part of the water cycle
- Develop and use models to demonstrate that water is always moving,
- Analyze cause-and-effect relationships to predict that temperature determines the type of precipitation for an area
- Develop and use models to show varying air masses' impact on weather patterns.
- Develop and use models to demonstrate how meteorologists use observations, patterns, and tools to predict weather

PA Standards/Anchors:

Eligible Content:

3.3.6-8.J	MS-ESS2-4 MS-ESS2-6 MS-PS1_4	MS-ESS2-5 MS-ESS3-2
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Instructional Strategies:

Assessments:

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|--|---|
| <ul style="list-style-type: none">• Cooperative groups• Lecture• Group discussion• Performance task• Hands-on activity• Note Taking | <ul style="list-style-type: none">• Weather mapping project• Extreme weather and climate change project• Chapter 2 Test |
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Grade: 7th Grade

Course: Earth Science

Topic/Concept: Minerals & Rocks in the Geosphere

Time Allotment: 16 Days

Unit Sequence: 3

Major Concepts to be learned:

- How do geologists study Earth's layered interior?
- What roles do heat and pressure in Earth's interior play in the cycling of matter?
- What are the patterns and effects of convection in Earth's mantle?
- What are the characteristics and properties of minerals?
- What processes result in the formation of minerals?
- What are the three major types of rocks, and how do they form?
- How does the flow of energy drive the processes of the rock cycle?

Expected Skills to be demonstrated:

- Students investigate how scientists study Earth's materials and model its layers
- Students study the processes that form minerals and the characteristics and properties of minerals
- Students study the three basic types of rocks and how rocks form
- Students investigate the materials that make up Earth, how they are continuously cycled, and what energy flows drive Earth's processes.

PA Standards/Anchors:

Eligible Content:

3.3.6-8.E, F

MS-ESS2-1

Instructional Strategies:

- Lecture
- Hands-on activity
- Note Taking
- Labs

Assessments:

- Chapter 3 Quiz
- Chapter 3 Test
- Rock cycle lab

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Plate Tectonics

Time Allotment: 16 Days

Unit Sequence: 4

Major Concepts to be learned:

- Evidence of Plate Motions
- Plate Tectonics and Earth's Surface
- Earthquakes and Tsunami Hazards
- Volcanoes and Earth's Surface

Expected Skills to be demonstrated:

- Students investigate evidence that supports the hypothesis of continental drift and the existence of Pangaea
- Students examine how convection drives plate motion and how the movement of Earth's plates has greatly changed the locations of the continents and the size and shape of the ocean basins. Students learn the ways that plates move at plate boundaries.
- Students learn how tension, shearing, and compression produce faults and other features. Students then analyze these features and events at Earth's surface to determine their relationship with plate boundaries
- Students examine the role that volcanic activity plays in shaping Earth's surface as well as the hazards that different types of volcanoes pose.
- Students explore the relationship between plate tectonics and volcanic eruptions and landforms.

PA Standards/Anchors:

Eligible Content:

3.3.6-8.G	MS-ESS2-2 MS-ESS2-3 MS-ESS3-2
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Instructional Strategies:

Assessments:

<ul style="list-style-type: none">• Cooperative groups• Problem solving activities• Lecture• Hands-on activity• Note Taking• Oreo Cookie Lab	<ul style="list-style-type: none">• Oreo Cookie Lab• Earthquake Structure Project• Ch4 Quiz• Ch4 Test
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Grade: 7th Grade

Course: Earth Science

Topic/Concept: Earth's Surface Systems

Time Allotment: 16 Days

Unit Sequence: 5

Major Concepts to be learned:

- Weathering and soil
- Erosion and deposition
- Water erosion
- Glacial and wave erosion

Expected Skills to be demonstrated:

- Students learn the two agents of weathering, mechanical and chemical weathering, and how these and other processes contribute to the formation of soil.
- Students investigate the forces, causes, and relationship between erosion and deposition, and explore how these processes help change Earth's surface features.
- Students model ways in which water causes erosion to learn how water creates landforms by carving out rock or building up sediment.
- Students learn how glacial movement carves out valleys in the land and deposits sediment to create new landforms, as well as how wave action contributes to the erosion and deposition of beaches.

PA Standards/Anchors:

Eligible Content:

3.3.6-8.H, I

MS-ESS2-2

MS-ESS3-2

Instructional Strategies:

Assessments:

- Cooperative groups
- Problem solving activities
- Lecture
- Hands-on activity
- Note Taking

- Weathering and Erosion Lab
- Ch5 Quiz
- Ch5 Test

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Distribution of Natural Resources

Time Allotment: 16 Days

Unit Sequence: 6

Major Concepts to be learned:

- Fossil Fuels
- Renewable energy resources
- Mineral resources
- Water resources

Expected Skills to be demonstrated:

- Students explore the diversity of nonrenewable energy sources and the impact of their scarcity on human energy use.
- Students investigate the difference between renewable resources, the benefits of alternative energy sources, and methods to reduce fossil fuel use.
- Students learn about the diversity of minerals in the world and how humans use them.
- Students investigate the distribution and characteristics of water resources on Earth and learn about the human impacts of use.

PA Standards/Anchors:

Eligible Content:

3.3.6-8.K

MS-ESS3-1
MS-ESS3-3
MS-ESS3-4

Instructional Strategies:

- Cooperative groups
- Problem solving activities
- Lecture
- Performance task
- Hands-on activity
- Note Taking

Assessments:

- Renewable energy project
- Ch6 Quiz
- Ch6 Test

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Human impacts on the environment

Time Allotment: 16 days

Unit Sequence: 7

Major Concepts to be learned:

- Population growth and resource consumption
- Air pollution
- Impacts on land
- Water pollution

Expected Skills to be demonstrated:

- Human population increases, human need for natural resources also increases and that resource use has impacts on Earth's systems
- Causes of air pollution, the long-term impact it has on Earth's systems, and effects to decrease the levels of air pollution around the world
- Natural resources obtained from Earth's geosphere, the importance of these resources, and how human activities impact the availability of resources
- Why freshwater is a limited resource within Earth's systems, how human activities cause freshwater and ocean pollution, and how humans utilize technology and other methods to help limit freshwater and ocean pollution

PA Standards/Anchors:

Eligible Content:

3.3.6-8.M, N, L

MS-ESS3-4

Instructional Strategies:

- Doodle notes
- Water Pollution Lab

Assessments:

- Lab
- Test
- Quiz

Grade: 7th Grade

Course: Earth Science

Topic/Concept: History Of Earth

Time Allotment: 13 Days

Unit Sequence: 8

Major Concepts to be learned:

- Determining ages of rocks
- Geologic time scale
- Major events in earth's history

Expected Skills to be demonstrated:

- Relative age versus absolute age of rocks
- Major events in Earth's history that shaped its geologic time scale
- Organization of Earth's history into Eon, Era, Period and Epoch

PA Standards/Anchors:

Eligible Content:

3.3.6-8. D

MS-ESS1-4

Instructional Strategies:

Assessments:

- Cooperative groups
- Lecture
- Group discussion
- Research
- Written work
- Hands-on activity
- Note Taking

- Doodle notes
- Test
- Quiz
- Vocab
- Time Period Project

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Energy in the Atmosphere & Oceans

Time Allotment: 13 Days

Unit Sequence: 9

Major Concepts to be learned:

- Energy and Earth's Atmosphere
- Patterns of Circulation in the Atmosphere
- Patterns of Circulation in the Ocean

Expected Skills to be demonstrated:

- Heat transfer and thermal energy in Earth's atmosphere and oceans
- Conduction, convection and radiation
- Energy flow in the atmosphere and oceans

PA Standards/Anchors:

Eligible Content:

3.3.6-8.K

MS-ESS2-1
MS-ESS2-4
MS-ESS2-6

Instructional Strategies:

- Interactivity
- Worksheets
- Lab
- Notes

Assessments:

Test
Quiz
Vocab

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Climate

Time Allotment: 13 Days

Unit Sequence: 10

Major Concepts to be learned:

- Climate factors
- Climate changes
- Effect of a changing climate

Expected Skills to be demonstrated:

- How latitude, altitude, land distribution, and ocean currents influence climate
- Greenhouse effect and use historical data and recent data to identify trends in Earth's warming and cooling patterns
- Understand how increase temperatures impact water levels, living organisms, and design solutions to mitigate impact

PA Standards/Anchors:

Eligible Content:

3.3.6-8.O

MS-ESS2-6
MS-ESS3-5

Instructional Strategies:

Assessments:

- research

- Climate project and cube

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Earth-Sun-Moon Systems

Time Allotment: 13 Days

Unit Sequence: 11

Major Concepts to be learned:

- Movement in space
- Earth's Movement in space
- Phases and Eclipses

Expected Skills to be demonstrated:

- Explore how the sun and moon impact earth
- Investigate objects in sky and how sun, Earth and other planets move in space
- How Earth and moon remain in orbit and how Earth's motion impacts daylight and seasons
- How sun and moon impact tides

PA Standards/Anchors:

Eligible Content:

3.3.6-8.C

MS-ESS1-1
DCI ESS1.A
DCI ESS1.B

Instructional Strategies:

Assessments:

- Lecture
- Performance task
- Research
- Video clips

- Quiz
- Test
- Project

Grade: 7th Grade

Course: Earth Science

Topic/Concept: Solar System & the Universe

Time Allotment: 16 Days

Unit Sequence: 12

Major Concepts to be learned:

- Solar system objects
- Learning about the universe
- Stars
- Galaxies

Expected Skills to be demonstrated:

- Evidence behind formation of celestial bodies
- Compare and contrast planets
- Technology used to detect electromagnetic radiation to produce images
- Classify stars based on physical characteristics
- Theory behind formation of the universe

PA Standards/Anchors:

Eligible Content:

3.3.6-8.A, B, C

MS-ESS1-2
MS-ESS1-3

Instructional Strategies:

Assessments:

- Lecture
- Hands-on activity
- Note Taking

- Project
- Test
- Quiz