

Grade 6: Earth and Space Science

Science

Grade 6, 1 Credit

Course Overview

In 6th grade science, process skills and critical thinking skills are emphasized and integrated throughout the units. Students are given many opportunities to develop these skills. Opportunities range from informal to formal classroom activities and investigations that teach, reinforce and apply these skills. Numerous strategies are used to develop student understanding.

6th grade science has been developed to cover the following topics: Rocks, Ecology, Earth Science, Space Science, and Flight. The sequence of these topics may vary depending upon timing of school year.

Scope and Sequence

Timeframe	Unit	Instructional Topics
30 Day(s)	Rocks	<ol style="list-style-type: none"> 1. Minerals 2. Rocks 3. Fossil 4. Scientific Method Mini Fair (SMMF)
20 Day(s)	Flight	<ol style="list-style-type: none"> 1. Force and Motion 2. Rockets 3. Scientific Method Mini Fair (SMMF)
20 Day(s)	Earth Science	<ol style="list-style-type: none"> 1. -ology and -ologist 2. Measurement and Safety 3. What is Earth Science? 4. Scientific Method Mini Fair (SMMF)
25 Day(s)	Ecology	<ol style="list-style-type: none"> 1. Ecology 2. Cycles 3. Atmosphere 4. Producers and Consumers 5. Scientific Method Mini Fair (SMMF)
10 Day(s)	Earth's Changing Surface	<ol style="list-style-type: none"> 1. You Are Here 2. Mapping 3. Erosion and Weathering 4. Scientific Method Mini Fair (SMMF)
8 Day(s)	Oceans	<ol style="list-style-type: none"> 1. Pieces of the Ocean 2. Scientific Method Mini Fair (SMMF)
25 Day(s)	Astronomy	<ol style="list-style-type: none"> 1. Space and Universe 2. Solar System 3. Rocketry 4. Scientific Method Mini Fair (SMMF)
35 Day(s)	Restless Earth	<ol style="list-style-type: none"> 1. Time 2. Plate Tectonics 3. Earthquakes 4. Volcanoes 5. Scientific Method Mini Fair (SMMF)

Materials and Resources

1. Holt Science and Technology- Earth Science (Short Courses F, G, H, J, and P)

A classroom set of each short course text is available to students at school. The text is also available online or on CD for students needing to access it at home.

2. Notebook
3. Folder
4. Agenda
5. Writing Utensil

Course Details

UNIT: Rocks -- 30 Day(s)

Academic Vocabulary

composition
crystal
decomposer
environmental conditions
fossil record
geological evidence
igneous
layers
metamorphic
sedimentary
rock layer movement
intrusive
extrusive
cleavage
reclamation
scientific method

Unit Level Key Questions

What is a mineral?
What is a rock?
What is a fossil?
What are the similarities and differences between minerals, rocks and fossils?
How do scientists determine Earth's history?

TOPIC: Minerals -- 9 Day(s)

Learning Targets

Describe the "chain of command"

element-crystal-mineral-rock

Assessment: Flow Map (F) (S)

Explain crystal formation

Assessment: Paper crystal and natural crystal activity (F) (S)

Circle Map w/Frame of Reference to answer "What is a crystal?"

Determine the importance of minerals/metals in everyday life

Assessment: Menu activities (S)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

TOPIC: Rocks -- 8 Day(s)

Learning Targets

Review the rock cycle

Assessment: Flow Map (F)

Compare and contrast rock types

Assessment: Double Bubble (F) (S)

Categorize rock samples

Assessment: Chaos to Categories (F) (S)

Tree Map (S)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

TOPIC: Fossil -- 5 Day(s)

Learning Targets

Categorize fossils

Assessment: Tree Map (S)

Differentiate between fossil types

Assessment: Logging Words and Images (F)

Identify important historical time frames/eras based upon fossil records

Assessment: Multiple Features Map (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

TOPIC: Scientific Method Mini Fair (SMMF) -- 4 Day(s)

Learning Targets

Create and complete a "paper rock cube"

Assessment: Rock Cube (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

UNIT: Flight -- 20 Day(s)

Academic Vocabulary

acceleration

aerodynamic

controlled experiment

data

direction of force

drag

gravitational force

impact

inertia

kinetic energy

potential energy

movement

scientific method

Unit Level Key Questions

What makes a flight possible?

What makes a rocket a rocket?

What does it take to make an object fly?

How can you make an object fly?

TOPIC: Force and Motion -- 10 Day(s)

Learning Targets

Define and explain forces that act upon things in flight

Assessment: Making Connections (F)

Define force and motion vocabulary

Assessment: Logging Words and Images (F)

Describe the principles of motion

Assessment: Teacher observation and class discussion (F)

Circle Map (F) (S)

Explain Bernoulli's Laws

Assessment: Windbag lab (F)

Circle Map w/Frame of Reference short paragraph to answer "What is Bernoulli's Law?" (S)
Recognize historical events that impact flight

Assessment: Timeline (S)

Make models to observe and test the impact of force and motion

Assessment: Teacher observation and class discussion (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

Participate in small and large group discussions

Assessment: Teacher observation (F)

TOPIC: Rockets -- 5 Day(s)

Learning Targets

Build and test own kit rocket

Assessment: Completion of kit directions and flight (F) (S)

Define and explain aerodynamic vocabulary

Assessment: Logging Words and Images (F)

Compare and contrast rockets and airplanes

Assessment: Double Bubble (F)

Write a short flight progress reflection

Assessment: Journal Entry (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

TOPIC: Measurement and Safety -- 5 Day(s)

Learning Targets

Construct a variety of paper "flying machines"

Assessment: Authentic models (F)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Develop a question, research, test, chart data and determine a conclusion based upon results

Assessment: Flight/Plane Activity (F) (S)

UNIT: Earth Science -- 20 Day(s)

Academic Vocabulary

controlled experiment
conversion
convert
data
equivalent
experimental control
express
hypothesis
research question
scientific method

Unit Level Key Questions

What is and who represents Earth Science?
Why is accuracy important when measuring?
What are the top safety practices?
How do you read a science textbook?
What is the scientific method?

TOPIC: -ology and -ologist -- 5 Day(s)

Learning Targets

Research and present information about a given -ologist

Assessment: Making Connections (F)

Tree Map (F)

3-5 minute presentation (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

TOPIC: Measurement and Safety -- 5 Day(s)

Learning Targets

Determine and demonstrate proper use of scientific tools and equipment

Assessment: Teacher observation (F)

Conduct simple in-class experiments

Assessment: Teacher observation (F)

Lab sheet (S)

Brace Map (F)

Practice and apply metric measurement

Assessment: Metric ladder (F)

Bridge Map (F)

Create a lab safety poster

Assessment: Safety Poster (S)

Demonstrate accuracy of conversions

Assessment: Bridge Map (F) (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

TOPIC: What is Earth Science? -- 5 Day(s)

Learning Targets

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)
Vocabulary tools (F) (S)
Comprehension tools (F) (S)

TOPIC: Ecology -- 2 Day(s)

Learning Targets

Practice and construct steps for the Scientific Method

Assessment: Flow Map (F)
Brace Map (F)

Create and perform a full scientific method process to answer a question

Assessment: Scientific Method poster (S)
Teacher Observation (F)

Participate in small and large group discussions

Assessment: Teacher observation (F)
Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)
Thinking Maps (F) (S)
Vocabulary tools (F) (S)
Comprehension tools (F) (S)

UNIT: Ecology -- 25 Day(s)

Academic Vocabulary

atmosphere
atmospheric composition
atmospheric layers
atmospheric pressure
data
debris
decomposer
ecosystem
environmental conditions
fungus
impact
layers
mutualism
oxygen
parasite
predator
prey
scientific method

Unit Level Key Questions

What is ecology?
Where do humans use/impact cycles?
What is atmosphere?
How does the atmosphere sustain life on Earth?
How do we fit in?

TOPIC: Ecology -- 2 Day(s)

Learning Targets

Brainstorm ideas to define ecology

Assessment: Circle Map (F)
Identify some ecologists

Assessment: Tree Map (F)
Discuss facts about an ecologist's career

Assessment: Tree Map (F)
Circle Map (F)
Class discussion (F)
Participate in small and large group discussions

Assessment: Teacher observation (F)
Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)
Thinking Maps (F) (S)
Vocabulary tools (F) (S)
Comprehension tools (F) (S)

TOPIC: Cycles -- 4 Day(s)

Learning Targets

Identify components of various cycles; carbon, water and nitrogen

Assessment: Brace Map (F)
Flow Map (F)
Logging Words and Images (F) (S)
Participate in small and large group discussions

Assessment: Teacher observation (F)
Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)
Thinking Maps (F) (S)
Vocabulary tools (F) (S)
Comprehension tools (F) (S)

TOPIC: Atmosphere -- 5 Day(s)

Learning Targets

Explain the importance of the atmosphere

Assessment: Flow Map (F) (S)
Participate in small and large group discussions

Assessment: Teacher observation (F)
Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)
Thinking Maps (F) (S)
Vocabulary tools (F) (S)
Comprehension tools (F) (S)

TOPIC: Producers and Consumers -- 5 Day(s)

Learning Targets

Identify the food chain

Assessment: Flow Map (S)
Create various food webs

Assessment: Food Web (S)
Compare and contrast producers and consumers

Assessment: Double Bubble w/ Frame of Reference paragraph to answer, "What are the similarities and differences between producers and consumers?"
Define ecological terms

Assessment: Logging Words and Images (F)
Choose and complete an ecological activity
Answer the KQ "How do we fit in?"

Assessment: Menu activity (S)
Participate in small and large group discussions

Assessment: Teacher observation (F)
Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)
Thinking Maps (F) (S)
Vocabulary tools (F) (S)
Comprehension tools (F) (S)

TOPIC: Scientific Method Mini Fair (SMMF) -- 2 Day(s)

Learning Targets

Create and conduct a Scientific Method process to answer a question

Assessment: Menu project (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

UNIT: Earth's Changing Surface -- 10 Day(s)

Unit Level Key Questions

What are longitude and latitude?

How do we map the surface?

What are topographic maps?

How do erosion and weathering change the earth's surface?

TOPIC: You Are Here -- 2 Day(s)

Learning Targets

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Create and conduct a Scientific Method process to answer a question

Assessment: Menu project (S)

TOPIC: Mapping -- 2 Day(s)

Learning Targets

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Describe map projections for accurate mapping

Assessment: Chapter test (S)

Teacher observation (F)

Explain how contour lines show elevation and landforms on maps

Assessment: Chapter test (S)

Teacher observation (F)

TOPIC: Erosion and Weathering -- 3 Day(s)

Learning Targets

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Describe how the shoreline, wind, ice and gravity cause weathering and erosion to occur.

Assessment: Chapter test (S)
Circle Map (F)

TOPIC: Scientific Method Mini Fair (SMMF) -- 3 Day(s)

Learning Targets

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Create and conduct a Scientific Method process to answer a question

Assessment: Menu project (S)

UNIT: Oceans -- 8 Day(s)

Unit Level Key Questions

How do we study the oceans?

What do we learn from the oceans?

What are we doing to the oceans?

What kind of controversial issues occur regarding the oceans?

TOPIC: Pieces of the Ocean -- 8 Day(s)

Learning Targets

Describe how the ocean is divided

Assessment: Flow Map (F)

Identify and classify the different ocean environments

Assessment: Tree Map (F)

Identify the regions of the ocean floor

Assessment: Brace Map (F)

Describe currents and how they effect climate

Assessment: Teacher observation (F)

Identify parts of a wave and how they form

Assessment: Brace Map (F)

Explain tides and their relationship with the earth, sun and moon

Assessment: Lab (S)

Identify important features of the ocean and explain their importance

Assessment: Chapter test (S)

TOPIC: Scientific Method Mini Fair (SMMF) -- 2 Day(s)

Learning Targets

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Create and conduct a Scientific Method process to answer a question

Assessment: Menu project (S)

UNIT: Astronomy -- 25 Day(s)

Unit Level Key Questions

How and why do we study space?
What are stars, galaxies, and the universe?
How was the solar system formed?
What are planets?
How do/did we explore space?
What is the process scientists use to ask and answer questions?

TOPIC: Space and Universe -- 10 Day(s)

Learning Targets

Describe ideas about the structure of the universe

Assessment: Flow Map (F)
Double Bubble (F)

Compare telescopes and explain how astronomers use them

Assessment: Teacher observation (F)
Explain how constellations are used to organize the night sky

Assessment: Circle Map (F)
Describe how scientist classify stars

Assessment: Flow Map (F)
Tree Map (F)
Teacher observation (F)

Describe the contents and characteristics of galaxies and the universe

Assessment: Circle Map (F)
Determine the stages in the life of a star

Assessment: Flow Map (S)
Identify important features of space and the universe and explain their importance to life

Assessment: Chapter test (S)
Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)
Participate in small and large group discussions

Assessment: Teacher observation (F)

TOPIC: Solar System -- 10 Day(s)

Learning Targets

Describe the structure and composition of the sun

Assessment: Bubble Map (F)
Teacher observation (F)

Explain the difference between rotation and revolution

Assessment: Brace Map (F)
Describe how the solar system was formed

Assessment: Flow Map (F)
Determine specific ways the inner and outer planets are different

Assessment: Short essay (S)
Circle Map (F)
Double Bubble (F)

Compare and contrast revolution and rotation

Assessment: Double Bubble (F)
Lab (F)

Describe the difference between a solar and lunar eclipse

Assessment: Teacher observation (F)
Double Bubble (F)

Determine why comets, asteroids, and meteoroids form solar systems

Assessment: Teacher observation (F)
Explain and identify the key factors that make the solar system and universe unique and important to life

Assessment: Chapter test (S)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

TOPIC: Rocketry -- 5 Day(s)

Learning Targets

Outline the developmental process of rocket technology

Assessment: Flow Map (S)

Explain the function of satellites and probes

Assessment: Notes from the NASA Powerpoint (F)

Summarize the history and future of human spaceflight

Assessment: Teacher observation (F)

Circle Map (F)

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

TOPIC: Plate Tectonics -- 12 Day(s)

Learning Targets

Utilize academic and content vocabulary in writing, reading and in conversation

Assessment: Teacher observation (F)

Thinking Maps (F) (S)

Vocabulary tools (F) (S)

Comprehension tools (F) (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Create and conduct a Scientific Method process to answer a question

Assessment: Menu project (S)

UNIT: Restless Earth -- 35 Day(s)

Unit Level Key Questions

What is the history of the earth?

What are tectonic plates?

How do earthquakes happen?

What causes volcanoes?

How do earthquakes occur?

TOPIC: Time -- 5 Day(s)

Learning Targets

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Review the rock cycle

Assessment: Flow Map (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

Compare uniformitarianism and catastrophism

Assessment: Double Bubble (F)

Explain how relative dating is used in geology

Assessment: Teacher observation (F)

Determine how geologic time is recorded in rock layers

Assessment: Bridge Map (F)

TOPIC: Plate Tectonics -- 12 Day(s)

Learning Targets

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Identify chemical and physical earth layers

Assessment: Tree Map (F)

Brace Map (F)

Explain continental drift and sea-floor spreading

Assessment: Lab (F) (S)

Describe plates and boundaries

Assessment: Teacher observation (F)

Determine how plates deform earth's crust by movement

Assessment: Short essay (S)

Identify important features of plate tectonics and explain their importance

Assessment: Chapter test (S)

TOPIC: Earthquakes -- 8 Day(s)

Learning Targets

Determine the cause of earthquakes

Assessment: Flow Map (F)

Earthquake building test (F) (S)

Explain why earthquakes take place.

Assessment: Teacher observation (F)

Describe how energy from earthquakes travels through the Earth.

Assessment: Teacher observation (F)

Unit test (S)

Classify ways earthquakes impact society

Assessment: Tree Map (F)

Determine how earthquake measurement is used to explain strength and intensity

Richter scale

Epicenter

S Wave

R Wave

Seismology

Assessment: Earthquake lab (F) (S)

Unit test (S)

Identify important features of earthquakes and explain their importance

Assessment: Chapter test (S)

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)
Various Thinking Maps (F)
Create and conduct a Scientific Method process to answer a question

Assessment: Menu project (S)

TOPIC: Volcanoes -- 8 Day(s)

Learning Targets

Participate in small and large group discussions

Assessment: Teacher observation (F)

Practice reading non-fiction text

Identify text elements

Author's purpose

Read for meaning

Assessment: B-D-A Content reading strategies (F)

Various Thinking Maps (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)

Compare and contrast volcanic eruptions

Assessment: Double Bubble (F)

Summarize the cause of volcanic eruptions and the methods scientists use to predict them

Assessment: Flow Map (F)

Essay (S)

TOPIC: Scientific Method Mini Fair (SMMF) -- 2 Day(s)

Learning Targets

Create and conduct a Scientific Method process to answer a question

How does energy move through Earth?

What is the reasoning for the patterns in the locations of earthquakes?

How does plate movement affect the Earth?

How is heat transferred within the Earth?

Assessment: Menu project (S)

Rubric (S)

Participate in small and large group discussions

Assessment: Teacher observation (F)

Utilize academic and content vocabulary in conversation

Assessment: Teacher observation (F)