

Curriculum Map: 6th Science 2020-2021

Course: Science6 Sub-topic: General

Grade(s): 6

Course Description: 6th grade Science will follow the PA Core Standards through the Anchors and Eligible Content guidelines as well as the NGSS through the CK12 program. The categories to be covered through the year are "The Nature of Science" which includes measuring, data collection and interpretation, connecting concepts to explain cause and effects, and making inferences and predictions based on science models and experiments. "Biological Science", for 6th grade, will focus on cell structure, and the survival of organisms through their environment and relationships. Next, "Physical Science" covers resources, conservation, motion and transfer of several types of energy in our world. Last, "Earth & Space" science will include discussions and practices on rocks and their cycles, land features and their creation as well as their transformation, weather vs. climate and our Earth's atmosphere and its components and function.

Course Textbooks, Workbooks, Materials Citations: [CK12](#) online textbook, with embedded videos, practice activities, SIMS, chat rooms and quizzes.

[Edpuzzles](#)

EduLastic (through clever)

Unit: 1. Nature of Science

Timeline: Week 35

Unit Description: In this unit, the students will be able to collect and interpret data and make predictions and inferences based on experiments and research. We will also enhance the skills of measuring through both the customary units of measure as well as the metric system.

Unit Essential Questions: What kinds of questions do scientists and engineers ask?
How do scientists and engineers develop and use models?
How is mathematics utilized in doing science?
In what ways are data analyzed, interpreted, and communicated?

Unit Big Ideas: Big Idea 1: Asking questions and defining problems are essential to developing scientific habits of mind

Big Idea 2: Scientists construct mental and conceptual models of phenomena to represent current understandings, aid in developing questions and experiments, and to communicate ideas to others.

Big Idea 3: Mathematics enables numerical representation of variables, symbolic representation of relationships between physical entities, and prediction of outcomes.

Big Idea 4: Data must be presented in a form that can reveal any patterns and relationships and that allows results to be communicated to others.

Unit Materials: CK12 online textbook and practice material.

Google Classroom

NewsELA

Science Journals for Kids

Unit**Assignments:** Google Docs through Google Classroom

Edulastic through Clever

Edpuzzles

Quizizz

Kahoot

Unit Key**Terminology & Definitions:**

evidence

investigate

observations

analyze

phenomena

models

predictions

Evaluate

function

interpretation

inference

STANDARDS: STANDARDSSTATE: Pennsylvania State Anchors (2010)[S6.A.1.1.1 \(Advanced\)](#)

Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., consumer product testing, common usage of simple machines, modern inventions).

[S6.A.1.1.2 \(Advanced\)](#)

Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines).

[S6.A.1.1.3 \(Advanced\)](#)

Predict the outcome of an experiment based on previously collected data.

[S6.A.1.2 \(Advanced\)](#)

Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems.

[S6.A.2 \(Advanced\)](#)

Processes, Procedures, and Tools of Scientific Investigations

[S6.A.2.1 \(Advanced\)](#)

Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems.

(* standards consolidated from Topic level)

Topic: 1.1 Tools in Science

Minutes for Topic: 60

STANDARDSSTATE: Pennsylvania State Anchors (2010)[S6.A.1.1.1 \(Advanced\)](#)

Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., consumer product testing, common usage of simple machines, modern inventions).

[S6.A.2 \(Advanced\)](#)

Processes, Procedures, and Tools of Scientific Investigations

Topic: 1.2 Units of Measure

Minutes for Topic: 60

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.2 \(Advanced\)](#) Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems.

Topic: 1.3 Scientific Method

Minutes for Topic: 60

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.1.2 \(Advanced\)](#) Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines).

[S6.A.2.1 \(Advanced\)](#) Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems.

Topic: 1.4 Inductive Reasoning

Minutes for Topic: 60

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.1.3 \(Advanced\)](#) Predict the outcome of an experiment based on previously collected data.

Topic: 1.5 Interpreting Data

Minutes for Topic: 60

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.1.3 \(Advanced\)](#) Predict the outcome of an experiment based on previously collected data.

Unit: 2. Biological Science

Timeline: Week 39

Unit Description: In this unit, Students will be able to recall the structure of cells and their basic functions. We will then expand our lessons to how organisms are categorized, develop, survive and coexist within ecosystems and different environments.

Unit Essential Questions: How do organisms live, grow, respond to their environment, and reproduce?

How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?

How and why do organisms interact with their environment and what are the effects of these interactions?

Unit Big Ideas: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.

Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.

Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.

Unit Materials: CK12 online textbook and practice material.

Google Classroom

NewsELA

Science Journals for Kids

Unit Google Docs through Google Classroom
Assignments: Edulastic through Clever
Edpuzzles
Quizizz
Kahoot

Unit Key Terminology & Definitions:

Eukaryote
Multicellular
Prokaryote
Unicellular

Abiotic
Biotic
Consumer
Ecosystem
Energy pyramid
Food chain
Food web
Niche
Predator
Prey
Producer
Symbiosis

Autotroph
Carnivore
Competition
Consumer
Decomposer
Energy pyramid
Food chain
Food web
Herbivore
Heterotroph
Omnivore
Photosynthesis
Predation
Primary
Producer
Secondary
Tertiary

Commensalism
Mutualism
Parasitism
Predator
Prey

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [S6.B.1.1 \(Advanced\)](#) Explain how the cell is the basic unit of structure and function for all living things.
- [S6.B.1.1.2 \(Advanced\)](#) Identify examples of unicellular and multi-cellular organisms (i.e., plants, fungi, bacteria, protists, and animals).
- [S6.B.2.1.2 \(Advanced\)](#) Recognize that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.
- [S6.B.3.1 \(Advanced\)](#) Identify evidence of change to infer and explain the ways different variables may affect change in natural or human-made systems.
- [S6.B.3.2 \(Advanced\)](#) Explain how renewable and nonrenewable resources provide for human needs.
- [S6.B.3.2.1 \(Advanced\)](#) Compare the usage of fossil fuels and alternative energy resources (e.g., oil, natural gas, coal, wind, solar, water).

(* standards consolidated from Topic level)

Topic: 2.1 Structure and Function of organisms**STANDARDS**

STATE: Pennsylvania State Anchors (2010)

- [S6.B.1.1 \(Advanced\)](#) Explain how the cell is the basic unit of structure and function for all living things.
- [S6.B.1.1.2 \(Advanced\)](#) Identify examples of unicellular and multi-cellular organisms (i.e., plants, fungi, bacteria, protists, and animals).

Topic: 2.2 Continuity of Life**STANDARDS**

STATE: Pennsylvania State Anchors (2010)

- [S6.B.2.1.2 \(Advanced\)](#) Recognize that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

Topic: 2.3 Ecological Behavior and Systems**STANDARDS**

STATE: Pennsylvania State Anchors (2010)

- [S6.B.3.1 \(Advanced\)](#) Identify evidence of change to infer and explain the ways different variables may affect change in natural or human-made systems.
- [S6.B.3.2 \(Advanced\)](#) Explain how renewable and nonrenewable resources provide for human needs.
- [S6.B.3.2.1 \(Advanced\)](#) Compare the usage of fossil fuels and alternative energy resources (e.g., oil, natural gas, coal, wind, solar, water).

Unit: 3. Physical Science

Timeline: Week 46

Unit Description: We will be covering and investigating all forms of energy and its resources, transfer, limits and efficiency. Also, the concepts of motion and the variables and factors of motion.

Unit Essential Questions: How can one explain the structure, properties, and interactions of matter?
How can one explain and predict interactions between objects within systems?
How is energy transferred and conserved?

Unit Big Ideas: Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.

Interactions between any two objects can cause changes in one or both of them.

Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.

Unit Materials:

CK12 online textbook and practice material.

Google Classroom

NewsELA

Science Journals for Kids

Unit

Assignments: Google Docs through Google Classroom

Edulastic through Clever

Edpuzzles

Quizizz

Kahoot

Unit Key Terminology & Definitions:

Boiling point
Characteristic
Conductivity
Density
Flammability
Malleability
Melting point
Odor
Properties
Pure Substance
Reactivity
Solubility

Gas
Liquid
Kinetic vs. Potential energy
Molecular motion
Solid
States of matter
Temperature
Thermal energy

Current
Electric charge
Electromagnetic

Forces
Resistance

Gravitation
Gravitational forces
Law of universal gravity
Mass
Weight

Acceleration
Balanced
Displacement
Distance
Force
Motion graphs
Net Force
Newton's 1st Law
Newton's 2nd Law
Position
Reference frame
Speed
Unbalanced
Velocity

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [S6.C.1.1.1 \(Advanced\)](#) Describe how characteristic physical properties of matter can be used to distinguish one substance from another (e.g., boiling point, freezing/melting points).
- [S6.C.1.1.2 \(Advanced\)](#) Explain that materials are characterized by having a specific amount of mass in each unit of volume (density).
- [S6.C.1.2.1 \(Advanced\)](#) Describe how water changes from one state to another.
- [S6.C.1.2.2 \(Advanced\)](#) Identify differences between chemical and physical changes of matter.
- [S6.C.2.1.1 \(Advanced\)](#) Describe how heat moves in predictable ways from warmer objects to cooler ones until they reach the same temperature.
- [S6.C.3.1.2 \(Advanced\)](#) Explain why gravitational force depends on how much mass the objects have and the distance between them.
- [S6.C.3.2 \(Advanced\)](#) Describe how magnets and electricity produce related forces.

(* standards consolidated from Topic level)

Topic: 3.1 Structure, Properties, and Interaction of Matter and Energy

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [S6.C.1.1.1 \(Advanced\)](#) Describe how characteristic physical properties of matter can be used to distinguish one substance from another (e.g., boiling point, freezing/melting points).
- [S6.C.1.1.2 \(Advanced\)](#) Explain that materials are characterized by having a specific amount of mass in each unit of volume (density).

Topic: 3.2 Forms, Sources, Conversion, and Transfer of Energy

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [S6.C.1.2.1 \(Advanced\)](#) Describe how water changes from one state to another.
- [S6.C.1.2.2 \(Advanced\)](#) Identify differences between chemical and physical changes of matter.

Topic: 3.3 Principles of Motion and Force

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [S6.C.2.1.1 \(Advanced\)](#) Describe how heat moves in predictable ways from warmer objects to cooler ones until they reach the same temperature.

[S6.C.3.1.2 \(Advanced\)](#)

Explain why gravitational force depends on how much mass the objects have and the distance between them.

[S6.C.3.2 \(Advanced\)](#)

Describe how magnets and electricity produce related forces.

Unit: 4. Earth & Space

Timeline: Week 7

Unit Description: Students will be able to identify the rock cycle stages, the process of the cycle and the ways humans use minerals found in the different stages of the Rock Cycle.

We will also cover the Earth's different climates, factors affecting climate zones, daily weather patterns, collecting and recording data on weather to make predictions and the atmosphere.

Unit Essential Questions: What is the universe, and what is Earth's place in it?

How and why is Earth constantly changing?

How do Earth's processes and human activities affect each other?

Unit Big Ideas: The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.

The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.

The Earth's processes affect and are affected by human activities.

Unit Materials:

CK12 online textbook and practice material.

Google Classroom

NewsELA

Science Journals for Kids

Unit

Assignments: Google Docs through Google Classroom

Edulastic through Clever

Edpuzzles

Quizizz

Kahoot

Unit Key Terminology & Definitions:

Axis
Cyclical pattern
Earth
Orbit
Orientation
Position
Revolution
Rotation

Rotation
Season
Tilt

Asteroids
Gravity
Moon
Satellite
Solar system

Geosphere
Energy flow
Erosion
Igneous
Metamorphic
Rock cycle
Sedimentary
Weathering

Asthenosphere
Continental
drift
Convection
Geosphere
Fossil record
Lithosphere
Mantle
Plate motion
Plate tectonics
Rock record
Seafloor
Spreading

Convection
Convergence
Crust
Divergence
Geosphere
Inner core
Mantle
Outer core
Plate tectonics

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[S6.D.1.1 \(Advanced\)](#) Describe how constructive and destructive natural processes can influence different biomes.

[S6.D.1.1.1 \(Advanced\)](#) Describe how soil fertility, composition, resistance to erosion, and texture are affected by many factors.

[S6.D.1.1.2 \(Advanced\)](#) Identify the three basic rock types and describe their formation (i.e., igneous [granite, basalt, obsidian, and pumice]; sedimentary [limestone, sandstone, shale, and coal]; and metamorphic [slate, quartzite, marble, and gneiss]).

[S6.D.2.1.1 \(Advanced\)](#) Describe cloud types and measurable factors (i.e., wind direction, temperature, barometric pressure, moisture, and

precipitation) that are associated with various weather patterns.

[S6.D.2.1.2 \(Advanced\)](#)

Interpret weather data to develop a weather forecast.

[S6.D.2.1.3 \(Advanced\)](#)

Explain how global patterns (jet stream, water currents) influence weather in measurable terms (e.g., wind direction, temperature, barometric pressure, precipitation).

[S6.D.3.1.1 \(Advanced\)](#)

Compare the size and surface features of the planets that comprise the solar system as well as the objects orbiting them.

[S6.D.3.1.2 \(Advanced\)](#)

Describe how the size, composition, and surface features of the planets are influenced by their distance from the Sun.

(* standards consolidated from Topic level)

Topic: 4.1 Earth Features

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.D.1.1.1 \(Advanced\)](#)

Describe how soil fertility, composition, resistance to erosion, and texture are affected by many factors.

[S6.D.1.1.2 \(Advanced\)](#)

Identify the three basic rock types and describe their formation (i.e., igneous [granite, basalt, obsidian, and pumice]; sedimentary [limestone, sandstone, shale, and coal]; and metamorphic [slate, quartzite, marble, and gneiss]).

Topic: 4.2 Processes That Change Earth and Its Resources

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.D.1.1 \(Advanced\)](#)

Describe how constructive and destructive natural processes can influence different biomes.

Topic: 4.3 Weather, Climate, and Atmospheric Processes

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.D.2.1.1 \(Advanced\)](#)

Describe cloud types and measurable factors (i.e., wind direction, temperature, barometric pressure, moisture, and precipitation) that are associated with various weather patterns.

[S6.D.2.1.2 \(Advanced\)](#)

Interpret weather data to develop a weather forecast.

[S6.D.2.1.3 \(Advanced\)](#)

Explain how global patterns (jet stream, water currents) influence weather in measurable terms (e.g., wind direction, temperature, barometric pressure, precipitation).

Topic: 4.4 Composition and Structure of the Universe

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.D.3.1.1 \(Advanced\)](#)

Compare the size and surface features of the planets that comprise the solar system as well as the objects orbiting them.

[S6.D.3.1.2 \(Advanced\)](#)

Describe how the size, composition, and surface features of the planets are influenced by their distance from the Sun.

Unit:

This Curriculum Map Unit has no Topics to display

Unit: 5. Experiments and Data interpretation

Timeline: Week 15

Unit Description: This unit is designed to review the first unit of the year, "Nature of Science". It reiterates all the concepts of measuring, interpreting and predicting techniques used in experiments throughout the course of the year.

STANDARDS: STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.1 \(Advanced\)](#) Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (visuals, scenarios, graphs).

Topic: 5.1 Interpreting scientific knowledge in a variety of formats

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.1 \(Advanced\)](#) Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (visuals, scenarios, graphs).

Topic: 5.2 variables and measurable changes

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.2 \(Advanced\)](#) Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems.

Topic: 5.3 using models to make predictions, draw inferences

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S6.A.1.1.2 \(Advanced\)](#) Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines).