

Wilson Area School District Planned Course Guide

Title of planned course: Grade 7 Science

Subject Area: Physical / Earth Science

Grade Level: 7th Grade

Course Description: This is an interdisciplinary course that integrates Physical and Earth Science. Students will review and expand upon concepts that were introduced in the 6th grade Physical and Earth Science curriculum. Through hands-on experiments, engaging demonstrations, and interactive explorations students will investigate topics such as interactions of matter, forces and motion, geological processes, and impacts on the environment. Students are introduced to the course material using scientific phenomena that engages students and fosters critical thinking and scientific inquiry. As students pose questions, they will gather evidence and apply scientific knowledge to help better understand the world around them. Students will also be exposed to numerous STEM Challenges which will utilize problem solving skills and help prepare our students to be informed citizens and future scientists.

Time/Credit for this Course: One academic school year

Curriculum Writing Committee: Gail Gagner

Curriculum Map

August / September: Physical Science:

- Unit 1: Interactions of Matter: Properties and Changes (4 weeks)

October: Physical Science:

- Unit 1: Interactions of Matter: Materials Science (3 weeks)
- Unit 2: Energy and Motion: Forces and Motion (1 weeks)

November: Physical Science:

- Unit 2: Energy and Motion: Forces and Motion (2 weeks)
- Unit 2: Energy and Motion: Mechanical Energy (2 weeks)

December: Physical Science:

- Unit 2: Energy and Motion: Mechanical Energy (3 weeks)

January: Physical Science / Earth & Space Science:

- Unit 2: Energy and Motion: Electromagnetic Forces (2 weeks)
- Unit 3: Impacts on the Environment: Human Impact on the Environment (2 weeks)

February: Earth & Space Science:

- Unit 3: Impacts on the Environment: Human Impact on the Environment (2 weeks)
- Unit 3: Impacts on the Environment: Earth and Human Activity (2 weeks)

March: Earth & Space Science:

- Unit 3: Impacts on the Environment: Earth and Human Activity (2 weeks)
- Unit 4: The Changing Earth: Geologic Time (2 weeks)

April: Earth & Space Science:

- Unit 4: The Changing Earth: Dynamic Earth (4 weeks)

May / June: Earth & Space Science:

- Unit 4: The Changing Earth: Distribution of Earth's Resources (2 weeks)
- Unit 4: The Changing Earth: Natural Hazards (2 weeks)

Wilson Area School District Planned Course Materials

Course Title: Science Grade 7

Textbook:

Inspire Science
McGraw Hill
2020
mheducation.com/prek-12

Teacher Resources:

Inspire Science
McGraw Hill
2020
Unit 4
Physical Science
Interactions of Matter
mheducation.com/prek-12

Inspire Science
McGraw Hill
2020
Unit 1
Physical Science
Energy and Motion
mheducation.com/prek-12

Inspire Science
McGraw Hill
2020
Unit 3
Earth and Space Science
Impact on the Environment
mheducation.com/prek-12

Inspire Science
McGraw Hill
2020
Unit 4
Earth and Space Science
The Changing Earth
mheducation.com/prek-12

Gizmos: Stem Simulations and Virtual Labs
<https://gizmos.explorelearning.com/>
[Study Island](#)
[CK12 Physical Science For Middle School Flexbook](#)
[CK12 Earth Science For Middle School Flexbook](#)
[Phet](#)

Curriculum Scope & Sequence

Planned Course: Science Grade 7

Unit 1: Physical Science: Interactions of Matter

Time frame: 7 Weeks

State Standards:

- 3.2.6-8.A Develop models to describe the atomic composition of simple molecules and extended structures.
- 3.2.6-8.B Develop a model that predicts and describes changes in the particle motion, temperature and state of a pure substance when thermal energy is added or removed.
- 3.2.6-8.C Gather and make sense of information to describe how synthetic materials come from natural resources and impact society.
- 3.2.6-8.D Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred
- 3.2.6-8.E Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
- 3.2.6-8.F Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.
- 3.2.6-8.I Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- 3.2.6-8.K Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
- 3.2.6-8.M Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- 3.2.6-8.N Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- 3.2.6-8.O Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
- 3.5.6-8.JJ Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.
- 3.5.6-8.EE Differentiate between inputs, processes, outputs, and feedback in technological systems.
- 3.5.6-8.FF Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.
- 3.5.6-8.GG Create an open-loop system that has no feedback path and requires human intervention.
- 3.5.6-8.HH Create a closed-loop system that has a feedback path and requires no human intervention.
- 3.5.6-8.CC Consider historical factors that have contributed to the development of technologies and human progress.
- 3.5.6-8.DD Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements.
- 3.5.6-8.B Use instruments to gather data on the performance of everyday products.
- 3.5.6-8.I Examine the ways that technology can have both positive and negative effects at the same time.
- 3.5.6-8.C Hypothesize what alternative outcomes (individual, cultural, and/or environmental) might have resulted had a different technological solution been selected.

- 3.5.6-8.G Analyze how an invention or innovation was influenced by the context and circumstances in which it is developed.
- 3.5.6-8.H Evaluate trade-offs based on various perspectives as part of a decision process that recognizes the need for careful compromises among competing factors.
- 3.5.6-8.F Analyze examples of technologies that have changed the way people think, interact, live, and communicate.
- 3.5.6-8.Y Compare, contrast, and identify overlap between the contributions of science, technology, engineering, and mathematics in the development of technological systems.
- 3.5.6-8.Q Apply a technology and engineering design thinking process.
- 3.5.6-8.T Create solutions to problems by identifying and applying human factors in design.
- 3.5.6-8.U Evaluate and assess the strengths and weaknesses of various design solutions given established principles and elements of design.
- 3.5.6-8.V Refine design solutions to address criteria and constraints.
- 3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Anchor(s) or adopted anchor:

- 3.3.6-8.A Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.3.1.1
- 3.3.6-8.B Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.3.1.1
- 3.3.6-8.C Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.3.1.1-3
- 3.2.6-8.D Anchors: S8.A.1.3; S8.A.2.1-2; S8.C.1.1.2
- 3.2.6-8.E Anchors: S8.C.1.1.3; S8.A.1.3; S8.A.2.1-2
- 3.2.6-8.F Anchors: S8.C.1.1.1; S8.C.1.1.3; S8.A.1.3; S8.A.2.1-2
- 3.2.6-8.I Anchors: S8.A.1.3; S8.A.2.1-2
- 3.2.6-8.K Anchors: S8.A.1.3; S8.A.2.1-2; S8.A.3.2; S8.C.3.1.1
- 3.2.6-8.M Anchors: S8.A.3.2; S8.C.2.1.2
- 3.2.6-8.N Anchors: S8.A.2.1-2; S8.C.2.1.3
- 3.2.6-8.O Anchors: S8.A.3.1; S8.C.2.1.2

Essential content/objectives: At end of the unit, students will be able to:

- Explore properties and changes of matter, including the changes in energy associated with chemical reactions.
- Analyze and interpret data to investigate physical properties and chemical properties of substances. These properties are used to describe and can be used to identify the substances.
- Explore how substances react chemically in characteristic ways.
- Develop and use models to show how the atoms that make up the original substances are regrouped into different molecules and how the total number of each type of atom is conserved, which explains the conservation of matter.
- Explore how changes in matter during chemical reactions result in energy being released in some reactions and stored in others. They will develop and use models to describe these processes.
- Investigate the properties of materials, how they are made, and the impact their production and use has on people and the environment.
- Explore the structure and properties of natural and synthetic materials and how that relates to their function.
- Develop and use models to enhance their understanding of how synthetic materials are made.
- Explore how chemical processes are used to make synthetic materials with different properties from those of the reactants.
- Engage in argument from evidence as they analyze the influence of synthetic material technology on society and the natural world.
- Apply the concepts they learn throughout the module to research materials suitable for building a shelter, which they will then design and test.

Core Activities: Students will complete/participate in the following:

- Review of 6th grade Unit 4: Physical Science: Understanding Matter
 - Review Materials:
 - Gizmo:
 - Temperature and Particle Motion
 - Phase Changes
 - Convection Cells
 - Protecting Permafrost: Heat Transfer Highway
 - Element Builder
 - Heat Transfer by Conduction
 - Teacher Created Activities / Worksheets:
 - Station Activities on Conduction, Convection, and Radiation
 - Station Activities on Atoms, Elements, Periodic Table Review
 - Subatomic Particle Review Chart
 - Compound Identification Chart
 - Heat Transfer Task Cards
 - [CK-12 Physical Science Flexbook](#)
 - Chpt. 3: Atomic Structure
 - Chpt. 4: Periodic Table
 - Videos:
 - [What's The Matter: Crash Course](#)
 - [Kinetic Theory and Phase Changes: Crash Course](#)
 - [Heat Transfer: Conduction, Convection, and Radiation: Next Generation Science](#)
 - [The Periodic Table: Crash Course Chemistry](#)
 - Blooket, Gimkit, Kahoot Review
 - Study Island Science STEELS :
 - Atoms & Molecules
 - Thermal Energy & States of Matter
- **Module 1: Matter: Properties and Changes:**
 - Labs:
 - Big Enough
 - More Mass v. More Volume
 - Don't Go Changing
 - Be A Detective
 - Positive Reaction
 - Reapproaching Reactions
 - Energy In, Energy Out
 - Investigations:
 - Determining Density
 - Broken Bonds
 - Trading Places (PHET)
 - Magnet Models
 - Gizmo: Density Laboratory
 - Gizmo: Chemical and Physical Changes
 - Gizmo: Electrons and Chemical Reactions
 - Gizmo: Reaction Energy
 - Gizmo: Magnetism
 - Phenomena / CER: Mystery Substance
 - Phenomena / CER: Chemical Reactions
 - Phenomena / CER: Energy In Bonds
 - STEM:

- Challenge: How Does A Light Stick Work?
- Career Exploration: A Day in the Life of a Forensic Toxicologist

- **Module 2: Materials Science:**

- Labs:
 - Materials Fair
 - Slime Time
 - Making Plastic
- Investigations:
 - Take Your Places
 - From This, To That
 - In The World
 - Obtaining Resources
 - Toss It
 - Analyzing Text
 - Impacting the Environment
 - Gizmo: Trebuchet
 - Gizmo: Feel the Heat
 - Phenomena / CER: Recycled Materials
 - Phenomena / CER: Impacts of Synthetic Materials
- STEM:
 - Challenge: Engineering Challenge: Take Cover
 - Career Exploration: A Day in the Life of a Materials Scientist

Extensions:

- Gizmos:
 - Determining Density via Water Displacement
 - Density Experiment: Slice and Dice
 - Sticky Molecules
 - Charge Launchers
 - Diffusion: Motion of Particles
 - Average Atomic Mass
 - Star Spectra
 - Melting Points
- Study Island Science STEELS:
 - Synthetic Materials
 - Chemical Reactions
 - Conservation of Mass
 - Devices that Release or Absorb Thermal Energy
 - Energy Transformations
- [CK-12 Physical Science Flexbook](#)
 - Chpt. 2 Matter and Change
 - Chpt. 5: Chemical Interactions
 - Chpt. 6: Carbon Chemistry
 - Chpt. 8: Nuclear Energy
 - Chpt. 9: Objects in Motion
- Relevant Current Events News Articles
- What If? Videos
- Crash Course Videos
- Escape Room Activity

Remediation:

- Small group instruction
- Teacher created review stations
- Mind Maps / Study Guides before Assessments
- Differentiated Worksheets / Practice Activities
- Additional Vocabulary Practice Activities
- Task Cards

Instructional Methods:

- Pre-Test Assessments
- Phenomenon Engagement Activities
- Science Probes
- CER Activities
- Ongoing STEM Projects / Explorations
- Direct Instruction
- Google Slideshow Presentations
- Vocabulary Activities
- Labs / Investigations
- Gizmos
- Guided Practice Worksheets
- Choice Boards
- Note Taking Strategies
- Modeling
- Station / Center Activities
- Task Cards
- Exit Tickets
- Group Work
- Large / Small Group Instruction
- Spiraling Review Activities
- Differentiated Activities
- Blooket, Gimkit, and Kahoots

Materials & Resources:

- *Inspire Science: Physical Science: Unit 4: Interactions of Matter (Modules 1 and 2).*
- [CK-12 Physical Science Flexbook](#)
- Gizmos
- Phet Interactive Simulations
- Study Island
- Lab / Investigation Materials
- Teacher Created Worksheets / Materials / Activities
- Edpuzzles
- Youtube Videos
- Teacher created Google docs, slideshows, and forms.

Assessments:

- Diagnostic Assessments:
 - Pre-Tests
 - Quizzes
 - Exit Tickets
 - Guided Practice Worksheets
 - Class Discussions
 - Mind Maps
- Formative Assessments:

- CER Activities
- Science Probes
- Blooket, Gimkit, Kahoot
- Study Island
- Labs / Investigations / Gizmos
- Summative Assessments:
 - End-of-Unit Tests
 - Labs / Investigations / Gizmos
 - Module STEM Challenges

Curriculum Scope & Sequence

Planned Course: Science Grade 7

Unit 2: Physical Science: Energy and Motion

Time frame: 10 Weeks

State Standards:

- 3.2.6-8.G Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- 3.2.6-8.H Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
- 3.2.6-8.I Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- 3.2.6-8.J Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
- 3.2.6-8.K Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
- 3.2.6-8.L Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass and speed of an object.
- 3.2.6-8.O Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
- 3.2.6-8.P Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- 3.3.6-8.B Develop and use a model to describe the role of gravity in the motion within galaxies and the solar system.
- 3.5.6-8.II Predict outcomes of a future product or system at the beginning of the design process.
- 3.5.6-8.LL Compare how different technologies involve different sets of processes.
- 3.5.6-8.JJ Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.
- 3.5.6-8.EE Differentiate between inputs, processes, outputs, and feedback in technological systems.
- 3.5.6-8.FF Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.
- 3.5.6-8.GG Create an open-loop system that has no feedback path and requires human intervention.
- 3.5.6-8.HH Create a closed-loop system that has a feedback path and requires no human intervention.
- 3.5.6-8.CC Consider historical factors that have contributed to the development of technologies and human progress.
- 3.5.6-8.B Use instruments to gather data on the performance of everyday products.
- 3.5.6-8.K Use devices to control technological systems
- 3.5.6-8.M (ETS) 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.
- 3.5.6-8.F Analyze examples of technologies that have changed the way people think, interact, live, and communicate.
- 3.5.6-8.Y Compare, contrast, and identify overlap between the contributions of science, technology, engineering, and mathematics in the development of technological systems.
- 3.5.6-8.Q Apply a technology and engineering design thinking process.
- 3.5.6-8.T Create solutions to problems by identifying and applying human factors in design.

- 3.5.6-8.U Evaluate and assess the strengths and weaknesses of various design solutions given established principles and elements of design.
- 3.5.6-8.V Refine design solutions to address criteria and constraints.
- 3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Anchor(s) or adopted anchor:

- 3.2.6-8.G Anchors: S8.C.3.1.1; S8.A.2.1-2
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- 3.2.6-8.I Anchors: S8.A.1.3; S8.A.2.1-2
- 3.2.6-8.J Anchors: S8.A.3.2; S8.C.3.1.1
- 3.2.6-8.K Anchors: S8.A.1.3; S8.A.2.1-2; S8.A.3.2; S8.C.3.1.1
- 3.2.6-8.L Anchors: S8.A.1.1; S8.C.3.1.1
- 3.2.6-8.O Anchors: S8.A.3.1; S8.C.2.1.2
- 3.2.6-8.P Anchors: S8.C.3.1.3
- 3.3.6-8.B Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.3.1.1

Essential content/objectives: At end of the unit, students will be able to:

- Investigate how to describe the position and motion of an object and how Newton's laws of motion describe the effects of force on motion.
- Explore how to describe the position and motion of an object.
- Analyze data including graphs to help construct and present arguments about the changes over time in the motions of objects.
- Explore how force affects motion.
- Plan and carry out investigations to enhance their understanding of the changes in motion caused by a net force.
- Explore how the force exerted by one object on a second object is equal in strength and opposite in direction to the force that the second object exerts on the first.
- Use models of the systems of objects to construct explanations to illustrate these force pairs and their effects on motion.
- Explore the attractive nature of gravitational force, the factors that affect it, and how it affects the motion of objects.
- Model systems of objects to compose arguments from evidence about forces.
- Apply the concepts they learn to design a safety barrier to reduce the damage in a collision.
- Investigate kinetic and potential energy and how they are transferred.
- Explore the definition of kinetic energy by analyzing and interpreting data they gather as they investigate proportional relationships among kinetic energy, mass, and speed.
- Explore how the potential energy of an object is affected by distance from Earth and mass.
- Develop and use models and analyze systems and system models to compare the potential energy of different objects.
- Explore the conservation of energy and the relationship between energy and force, including how the exertion of a force can cause a transfer of energy.
- Develop and use models and observe patterns to understand how energy can be transferred through work.
- Construct, use, and present arguments about energy transfer in an amusement park.
- Investigate magnetic and electric forces, circuits, and electromagnetism.
- Explore magnetic forces and what the size of the force depends on.
- Develop and use models to enhance their understanding of magnetic fields and forces as well as their causes and effects.
- Examine systems of magnets to understand the stored (potential) energy.
- Explore electric forces and what the size of the force depends on.

- Develop and use models to enhance their understanding of electric fields and forces as well as their causes and effects.
- Explore the systems of simple circuits and how electric forces cause the movement of electrically charged particles in electric currents.
- Explore electromagnetism, or the interaction between electric charges and magnets.
- Investigate how electric currents generate magnetic fields and how magnetic fields can be used to generate electric current through the exertion of forces at a distance.
- Develop and use models to enhance their understanding of these processes and will investigate and explain the causes and effects of changes to electromagnetic devices.

Core Activities: Students will complete/participate in the following:

- Review of 6th grade Unit 1: Earth & Space: Exploring Space
 - Review Materials:
 - Gizmo:
 - Orbital Motion
 - Motions of Venus and Earth
 - Teacher Created Activities / Worksheets:
 - Weight on Planet Activities
 - Subatomic Particle Review Chart
 - A Closer Look: Space Travel
 - [CK-12 Earth Science Flexbook](#)
 - Chpt. 3: The Earth
 - Chpt. 22: The Solar System
 - Videos:
 - [Kepler's Laws: Physics Animation \(EarthPen\)](#)
 - Blooket, Gimkit, Kahoot Review
 - Study Island Science STEELS:
 - Gravity and the Universe
- Module 1: Forces and Motion:
 - Labs:
 - Watch It Go
 - Be The Fastest
 - Up to Speed
 - Sticky Situation
 - A Balancing Act
 - Pulling Your Weight
 - Bounce Back
 - Use the Forces
 - Weighing Washers
 - Investigations:
 - Follow the Directions
 - Start from Here
 - See You Soon
 - Point the Way
 - Plot It
 - When Push Comes to Shove (PHET)
 - Diagram a Force
 - Back to Back
 - The Pencil Dropped Around the World
 - The Force of Gravity (PHET)
 - Gravity of Objects
 - Gizmo: Distance Time Graphs
 - Gizmo: Cat and Mouse
 - Gizmo: 2D Collisions

- How It Works: GPS to the Rescue
 - A Closer Look: Safer Barriers
 - Phenomena / CER: Train Ride
 - Phenomena / CER: Constant Mowing
 - Phenomena / CER: Blowing in the Wind
 - STEM:
 - Challenge: Engineering Challenge: Crash Course
 - Challenge: Wind Carts
 - Career Exploration: A Day in the Life of a Vehicle Crash Test Engineer
- Module 2: Mechanical Energy:
 - Labs:
 - Mass Matters
 - Picking up Speed
 - Slingshot Physics
 - The Energy of a Pendulum
 - So Much Work
 - Double Pendulum
 - Investigations:
 - Rolling On
 - Dropping the Ball
 - Gizmo: Energy of Pendulum
 - Gizmo: Potential Energy on Shelves
 - Gizmo: Sled Wars
 - Gizmo: Roller Coaster Physics
 - Gizmo: Circuits
 - Gizmo: Inclined Plane: Simple Machine
 - Phenomena / CER: Soccer Ball
 - Phenomena / CER: Don't Fall
 - Phenomena / CER: Swing Low
 - STEM:
 - Challenge: Energy at the Amusement Park
 - Career Exploration: A Day in the Life of a Roller Coaster Designer
- Module 3: Electromagnetic Forces:
 - Labs:
 - Paper Clip Pick Up
 - The Strength of Magnets
 - Magnet Personality
 - Magnetic Fields
 - Moving Magnets
 - Create A Magnet
 - From Top to Bottom
 - Paper Pick Up
 - Lighten Up
 - Power Up
 - Pointing Directions
 - Electromagnetic Challenge (Engineering Lab)
 - Motor On
 - Coiled Up
 - Lift it Up
 - Investigations:
 - Field Rings (PHET)

- Making Magnetic Fields (PHET)
 - Gizmo: Magnetic Induction
 - Gizmo: Electromagnetic Induction
 - Gizmo: Charge Launcher
 - Gizmo: Circuit Builder
 - Gizmo: Advanced Circuits
 - How It Works: Van de Graaff Generator
 - A Closer Look: Magnetic Migration
 - Phenomena / CER: Which Pole Is It?
 - Phenomena / CER: Electric Charge
 - Phenomena / CER: Plugging In
- STEM:
 - Challenge: Engineering Challenge: The Great Metal Pick Up Machine
 - Career Exploration: A Day in the Life of a Maglev Train Engineer

Extensions:

- Gizmos:
 - Air Track
 - Fan Cart Physics
 - Energy Conversions
 - Household Energy Usage
 - Ants on a Slant
 - Polarity and Intermolecular Forces
 - Golf Range
 - Gravity Pitch
- Study Island Science STEELS:
 - Newton's Third Law
 - Force and Motion
 - Electricity and Magnetism
 - Gravitational Interactions
 - Kinetic Energy
- [CK-12 Physical Science Flexbook](#)
 - Chpt. 10: Forces
 - Chpt. 11: Newton's Laws of Motion
 - Chpt. 12: Fluid Forces
 - Chpt. 13: Work and Machines
- Relevant Current Events News Articles
- What If? Videos
- [Newton's Laws: Crash Course Physics #5](#)
- [Kinetic Theory and Phase Changes: Crash Course Physics #21](#)
- Escape Room Activity

Remediation:

- Small group instruction
- Teacher created review stations
- Mind Maps / Study Guides before Assessments
- Differentiated Worksheets / Practice Activities
- Additional Vocabulary Practice Activities
- Task Cards

Instructional Methods:

- Pre-Test Assessments
- Phenomenon Engagement Activities
- Science Probes
- CER Activities
- Ongoing STEM Projects / Explorations
- Direct Instruction
- Google Slideshow Presentations
- Vocabulary Activities
- Labs / Investigations
- Gizmos
- Guided Practice Worksheets
- Choice Boards
- Note Taking Strategies
- Modeling
- Station / Center Activities
- Task Cards
- Exit Tickets
- Group Work
- Large / Small Group Instruction
- Spiraling Review Activities
- Differentiated Activities
- Blooket, Gimkit, and Kahoots

Materials & Resources:

- *Inspire Science: Physical Science: Unit 1: Energy and Motion (Modules 1, 2, and 3).*
- [CK-12 Physical Science Flexbook](#)
- [CK-12 Earth Science Flexbook](#)
- Gizmos
- Phet Interactive Simulations
- Study Island Science STEELS
- Lab / Investigation Materials
- Teacher Created Worksheets / Materials / Activities
- Edpuzzles
- Youtube Videos
- Teacher created Google docs, slideshows, and forms.

Assessments:

- Diagnostic Assessments:
 - Pre-Tests
 - Quizzes
 - Exit Tickets
 - Guided Practice Worksheets
 - Class Discussions
 - Mind Maps
- Formative Assessments:
 - CER Activities
 - Science Probes
 - Blooket, Gimkit, Kahoot
 - Study Island
 - Labs / Investigations / Gizmos

- Summative Assessments:
 - End-of-Unit Tests
 - Labs / Investigations / Gizmos
 - STEM Challenges

Curriculum Scope & Sequence

Planned Course: Science Grade 7

Unit 3: Earth & Space Science: Impacts on the Environment

Time frame: 8 Weeks

State Standards:

- 3.3.6-8.E Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales
- 3.3.6-8.F Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process
- 3.3.6-8.H Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- 3.3.6-8.I 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.
- 3.3.6-8.K Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- 3.3.6-8.M Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
- 3.3.6-8.N Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems.
- 3.3.6-8.O Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
- 3.4.6-8.B Analyze and interpret data about how different societies (economic and social systems) and cultures use and manage natural resources differently.
- 3.4.6-8.C Develop a model to describe how watersheds and wetlands function as systems, including the roles and functions they serve.
- 3.4.6-8.D Gather, read, and synthesize information from multiple sources to investigate how Pennsylvania environmental issues affect Pennsylvania's human and natural systems.
- 3.4.6-8.E Collect, analyze, and interpret environmental data to describe a local environment.
- 3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.
- 3.4.6-8.H Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.
- 3.4.6-8.I Construct an explanation that describes regional environmental conditions and their implications on environmental justice and social equity.
- 3.5.6-8.JJ Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.
- 3.5.6-8.EE Differentiate between inputs, processes, outputs, and feedback in technological systems.
- 3.5.6-8.FF Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.
- 3.5.6-8.GG Create an open-loop system that has no feedback path and requires human intervention.
- 3.5.6-8.HH Create a closed-loop system that has a feedback path and requires no human intervention.
- 3.5.6-8.CC Consider historical factors that have contributed to the development of technologies and human progress.
- 3.5.6-8.I Examine the ways that technology can have both positive and negative effects at the same time.

- 3.5.6-8.E Consider the impacts of a proposed or existing technology and devise strategies for reducing, reusing, and recycling waste caused by its creation.
- 3.5.6-8.D Analyze how the creation and use of technologies consumes renewable, non-renewable, and inexhaustible resources; creates waste; and may contribute to environmental challenges
- 3.5.6-8.C Hypothesize what alternative outcomes (individual, cultural, and/or environmental) might have resulted had a different technological solution been selected.
- 3.5.6-8.G Analyze how an invention or innovation was influenced by the context and circumstances in which it is developed.
- 3.5.6-8.H Evaluate trade-offs based on various perspectives as part of a decision process that recognizes the need for careful compromises among competing factors.
- 3.5.6-8.F Analyze examples of technologies that have changed the way people think, interact, live, and communicate.
- 3.5.6-8.Y Compare, contrast, and identify overlap between the contributions of science, technology, engineering, and mathematics in the development of technological systems.
- 3.5.6-8.Z Analyze how different technological systems often interact with economic, environmental, and social systems.
- 3.5.6-8.BB Demonstrate how knowledge gained from other content areas affects the development of technological products and systems.
- 3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Anchor(s) or adopted anchor:

- 3.3.6-8.E Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.1-4; S8.D.2.1.2
- 3.3.6-8.F Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.1-4; S8.D.2.1.2
- 3.3.6-8.H Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.3.1-2; S8.D.1.3.4
- 3.3.6-8.I Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.3.1-2; S8.D.1.3.4
- 3.3.6-8.K Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-2; S8.B.3.2-3; S8.D.1.1.2; S8.D.1.2.1-2
- 3.3.6-8.M Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.4
- 3.3.6-8.N Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.4
- 3.3.6-8.O Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.2.1.1-3

Essential content/objectives: At end of the unit, students will be able to:

- Explore how human activities impact Earth's land, water, atmosphere, and climate.
- Analyze data, develop and use models, and design solutions to enhance their understanding of how humans cause changes to Earth's land environments.
- Construct explanations and use models to enhance their understanding of how humans cause and can minimize changes to Earth's water environments.
- Construct explanations to enhance their understanding of how humans cause and can minimize air pollution.
- Ask questions and construct explanations to enhance their understanding of how humans cause changes to Earth's climate.
- Design plans for monitoring and minimizing environmental impacts.
- Learn how the human population has increased over time.
- Investigate the factors that affect the growth of human populations and engage in scientific arguments about the cause and-effect relationship between human population growth and increased consumption of resources.
- Learn how people use resources and how increased consumption of resources affects Earth's systems.
- Use evidence to explain how activities and technology can mitigate the negative impacts on Earth.

- Present an argument in a panel discussion about how the growing human population and per-capita consumption of resources impact Earth and its systems.

Core Activities: Students will complete/participate in the following:

- Review of 6th grade Unit 2: Earth & Space: Water & Climate:
 - Review Materials:
 - Gizmo:
 - Water Cycle
 - Greenhouse Effect
 - Carbon Cycle
 - Teacher Created Activities / Worksheets:
 - Water Cycle Task Cards
 - A Life in the Day of a Raindrop
 - [CK-12 Earth Science Flexbook](#)
 - Chpt. 10: Atmospheric Processes
 - Videos:
 - [The Great Aqua Adventure: Crash Course Kids](#)
 - [Dinosaur Pee? Crash Course Kids](#)
 - Blooket, Gimkit, Kahoot Review
 - Study Island Science STEELS :
 - The Water Cycle
- Module 1: Human Impact on the Environment:
 - Labs:
 - Move Over
 - Modeling Earth's Farmland
 - Lose the Leachate (Engineering Lab)
 - Drip Drop
 - Pollution in Motion
 - Waves of Waste
 - Close to Home
 - An "Eggcellent" Question
 - Investigations:
 - The Last Frontier Forests
 - Rainfall Runoff
 - Relaxing on the Refuse
 - Trash Classification
 - Case Study: The Aral Sea
 - Sinkholes
 - Ocean Garbage
 - Solutions for Pollution (Engineering Investigation)
 - In a Haze
 - Oh the Ozone
 - As a Matter of Fact
 - Damaging Drizzle
 - International and National Initiatives
 - Debate It (Engineering Investigation)
 - For the Record
 - Greenhouse Gasses
 - On the Rise
 - Now You See it, Now You Don't
 - Signs in the Sea
 - Stewards of the Planet
 - Gizmo: GMO's in the Environment

- Gizmo: Water Pollution
 - Phenomena / CER: Environmental Pollution
 - Phenomena / CER: Warning: No Swimming
 - Phenomena / CER: What is Air Pollution?
- STEM:
 - Engineering Challenge: Who Moves In Next Door?
 - Gizmo STEM Case: Smelling in the Rain: Designing Solutions to Improve Air Quality
 - Career Exploration: Oceans on the Rise – Again
- **Module 2: Earth and Human Activity:**
 - Labs:
 - Bean There, Done That
 - Investigations:
 - Here We Grow Again
 - Comparing Ages
 - Increasing and Decreasing Populations
 - Population Simulation
 - Resource Consumption
 - Falling Forests
 - Arc of Deforestation
 - Engineering Solutions
 - Step Toward a Better Future
 - Gizmo: Population and Samples
 - Gizmo: Forest Ecosystem
 - Phenomena / CER: Population Fluctuation
 - Phenomena / CER: Natural Resources
 - STEM:
 - Challenge: 7.6 Billion and Counting
 - Career Exploration: A Day in the Life of a Demographer

Extensions:

- Gizmos:
 - Water Crisis
 - Effect of Environment on New Life Form
- Study Island Science STEELS:
 - Global Climate Change
 - Distribution of Natural Resources
 - Humans and Natural Hazards
 - Human and Environmental Impacts
 - Natural Resources and Human Populations
- [CK-12 Earth Science Flexbook](#)
 - Chpt. 17: Evolution and Populations
 - Chpt. 19: History of Life on Earth
- Relevant Current Events News Articles
- What If? Videos
- Crash Course Videos
- Escape Room Activity

Remediation:

- Small group instruction
- Teacher created review stations
- Mind Maps / Study Guides before Assessments

- Differentiated Worksheets / Practice Activities
- Additional Vocabulary Practice Activities
- Task Cards

Instructional Methods:

- Pre-Test Assessments
- Phenomenon Engagement Activities
- Science Probes
- CER Activities
- Ongoing STEM Projects / Explorations
- Direct Instruction
- Google Slideshow Presentations
- Vocabulary Activities
- Labs / Investigations
- Gizmos
- Guided Practice Worksheets
- Note Taking Strategies
- Modeling
- Station / Center Activities
- Exit Tickets
- Group Work
- Large / Small Group Instruction
- Spiraling Review Activities
- Differentiated Activities
- Blooket, Gimkit, and Kahoots

Materials & Resources:

- *Inspire Science: Earth and Space: Unit 3: Impacts on the Environment (Modules 1 and 2).*
- [CK-12 Earth Science Flexbook](#)
- Gizmos
- Phet Interactive Simulations
- Study Island
- Lab / Investigation Materials
- Teacher Created Worksheets / Materials / Activities
- Edpuzzles
- Youtube Videos
- Teacher created Google docs, slideshows, and forms.

Assessments:

- Diagnostic Assessments:
 - Pre-Tests
 - Quizzes
 - Exit Tickets
 - Guided Practice Worksheets
 - Class Discussions
 - Mind Maps

- Formative Assessments:
 - CER Activities
 - Science Probes
 - Blooket, Gimkit, Kahoot
 - Study Island
 - Labs / Investigations / Gizmos
- Summative Assessments:
 - End-of-Unit Tests
 - Labs / Investigations / Gizmos
 - Module STEM Challenges

Curriculum Scope & Sequence

Planned Course: Science Grade 7

Unit 4: Earth & Space Science: The Changing Earth

Time frame: 10 Weeks

State Standards:

- 3.3.6-8.D Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
- 3.3.6-8.E Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales
- 3.3.6-8.F Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
- 3.3.6-8.G Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.
- 3.3.6-8.H Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- 3.3.6-8.I 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.
- 3.3.6-8.J Collect data to provide evidence for how the motion and complex interactions of air masses result in changes in weather conditions.
- 3.3.6-8.K Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- 3.3.6-8.L Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- 3.3.6-8.M Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
- 3.3.6-8.N Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems.
- 3.3.6-8.O Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
- 3.2.6-8.Q 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.
- 3.2.6-8.R Develop and use a model to describe how waves are reflected, absorbed, or transmitted through various materials.
- 3.4.6-8.B Analyze and interpret data about how different societies (economic and social systems) and cultures use and manage natural resources differently.
- 3.4.6-8.C Develop a model to describe how watersheds and wetlands function as systems, including the roles and functions they serve.
- 3.5.6-8.KK Explain how technology and engineering are closely linked to creativity, which can result in both intended and unintended innovations.
- 3.5.6-8.II Predict outcomes of a future product or system at the beginning of the design process.
- 3.5.6-8.LL Compare how different technologies involve different sets of processes.
- 3.5.6-8.JJ Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.
- 3.5.6-8.EE Differentiate between inputs, processes, outputs, and feedback in technological systems.
- 3.5.6-8.FF Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.

- 3.5.6-8.HH Create a closed-loop system that has a feedback path and requires no human intervention.
- 3.5.6-8.CC Consider historical factors that have contributed to the development of technologies and human progress.
- 3.5.6-8.M (ETS) 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.
- 3.5.6-8.F Analyze examples of technologies that have changed the way people think, interact, live, and communicate.
- 3.5.6-8.Y Compare, contrast, and identify overlap between the contributions of science, technology, engineering, and mathematics in the development of technological systems.
- 3.5.6-8.Z Analyze how different technological systems often interact with economic, environmental, and social systems.
- 3.5.6-8.BB Demonstrate how knowledge gained from other content areas affects the development of technological products and systems.
- 3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Anchor(s) or adopted anchor:

- 3.3.6-8.D Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.2; S8.D.1.1.4
- 3.3.6-8.E Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.1-4; S8.D.2.1.2
- 3.3.6-8.F Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.1-4; S8.D.2.1.2
- 3.3.6-8.G Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-2
- 3.3.6-8.H Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.3.1-2; S8.D.1.3.4
- 3.3.6-8.I Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.3.1-2; S8.D.1.3.4
- 3.3.6-8.J Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.2.1.1-3
- 3.3.6-8.K Anchors: S8.A.1.1-2; S8.A.3.1-2; S8.B.3.2-3; S8.D.1.1.2; S8.D.1.2.1-2
- 3.3.6-8.L Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.2
- 3.3.6-8.M. Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.4
- 3.3.6-8.N. Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.1.1.4
- 3.3.6-8.O. Anchors: S8.A.1.1-3; S8.A.2.1-2; S8.A.3.1-3; S8.D.2.1.1 S8; D.2.1.2-3
- 3.2.6-8.Q Anchor: S8.A.1.1
- 3.2.6-8.R Anchor: S8.A.1.1

Essential content/objectives: At end of the unit, students will be able to:

- Explore the sequencing of events preserved in the geologic record.
- Use models to observe time phenomena and analyze and interpret rock strata and the fossil record to provide relative dates.
- Construct scientific explanations based on evidence gathered and an understanding of the principles of relative-age dating.
- Explore how geologists use correlation, evidence of Earth's major events, and the fossil record to build a timeline of Earth's history.
- Create a scale model of the geologic time scale, and construct scientific explanations to enhance their understanding of how the geologic time scale is interpreted from rock strata and used to organize Earth's history.
- Explain how rocks and fossils provide evidence about major events in Earth's history and how that evidence is used to organize the geologic time scale.
- Explore how the continents have moved over time on Earth's surface.
- Analyze and interpret data and identify patterns of the distribution of fossils and rocks, continental shapes, landmasses, glacial features, and climate to provide evidence of past plate motions.
- Explore the development of the theory of plate tectonics.

- Analyze and interpret data and identify patterns based on the locations of seafloor structures and the ages of rocks to provide evidence of past plate motions.
- Explore how the movement of plates forms mountain ranges and volcanoes and causes earthquakes.
- Construct explanations, develop and use models, and identify patterns to understand how plates move and interact.
- Explore the processes of weathering, erosion, and deposition, which shape Earth's surface.
- Construct explanations based on evidence of how geoscience processes (weathering, erosion, and deposition) have changed Earth's surface at varying time and spatial scales.
- Explore the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.
- Develop and use models to describe the stability and change of these geoscience processes.
- Apply the concepts they learn throughout the module to develop a model that shows the rock cycle, and will prepare an article explaining the model.
- Construct explanations about how people depend on Earth's energy, land, water, and air resources. They will identify resources used to make common items and analyze their daily use of resources.
- Recognize the factors that determine whether a resource is renewable or nonrenewable, and model the depletion of a nonrenewable resource.
- Analyze and interpret maps and other data to recognize patterns in the distribution of resources.
- Discover that Earth's resources, including minerals, soil, fossil fuels, and groundwater, are distributed unevenly around the planet.
- Learn how humans extract and obtain natural resources.
- Analyze patterns and systems to construct explanations about the cause-and-effect relationship between the use of resources and the distribution and availability of resources.
- Explain how people depend on Earth's resources, why resources are not distributed evenly, and how people affect resource distribution.
- Construct explanations about the geologic forces that cause earthquakes, including the buildup of stress along tectonic plate boundaries.
- Discover how earthquakes are measured and recognize the factors that affect the severity of damage caused by an earthquake.
- Analyze and interpret data related to earthquake risk and use maps to understand the patterns scientists use to predict the likelihood of future events.
- Learn about earthquake safety measures, including technologies to mitigate the impacts of an earthquake.
- Discover that scientists can reliably predict some natural hazards, such as volcanic eruptions, by analyzing and monitoring geologic forces in a region and by analyzing the region's past patterns of volcanic eruptions.
- Analyze and interpret data related to volcano risk, and will learn about the technologies used to mitigate the impacts of a volcanic eruption.
- Construct explanations about the factors that cause severe weather, such as hurricanes, tornadoes, droughts, and floods.
- Analyze and interpret data to determine the risk of severe weather in different regions, and use maps to understand the patterns scientists use to predict the likelihood of future events.
- Learn about safety measures to take in the event of severe weather.
- Apply the concepts they learn throughout the module to model and test methods to mitigate the effects of landslides on homes.

Core Activities: Students will complete/participate in the following:

- Review of 6th grade Unit 2: Earth & Space: Water & Climate:
 - Review Materials:
 - Gizmo:
 - Coriolis Effect

- Coastal Winds and Clouds
 - Teacher Created Activities / Worksheets:
 - Reading a Weather Map
 - [CK-12 Earth Science Flexbook](#)
 - Chpt. 11: Weather
 - Chpt. 12: Climate
 - Videos:
 - [The Coriolis Effect](#)
 - Blooket, Gimkit, Kahoot Review
 - Study Island Science STEELS :
 - Atmospheric Convection and Climate
 - Oceanic Convection and Climate
 - Weather
 - Global Climate Change
- **Review of 6th grade Unit 3: Physical Science: Understanding Waves:**
 - Review Materials:
 - Gizmo:
 - Longitudinal Waves
 - Earthquake Recording Station
 - Earthquake Determination of an Epicenter
 - Teacher Created Activities / Worksheets:
 - Measuring Earthquake Waves
 - [CK-12 Physical Science Flexbook](#)
 - Chpt. 16: Waves
 - Videos:
 - [Seismic Waves Explained](#)
 - Blooket, Gimkit, Kahoot Review
 - Study Island Science STEELS :
 - Wave Properties
 - Wave Behavior
- **Module 1: Geologic Time:**
 - Labs:
 - Layers Rock
 - Modeling Metaphors
 - Investigations:
 - The Present is the Key to the Past
 - Relatively Speaking
 - Clues to Earth's Past
 - Reconstructing Past Environments
 - Gaps in the Rock Record
 - It's A Match
 - Ashes, Ashes, We All Fall Down
 - The Riddle of the Rocks
 - It's About Time
 - Phenomena / CER: How Old is Earth
 - Phenomena / CER: Scientific Explanations
 - STEM:
 - Engineering Challenge: History of Rock.
 - Career Exploration: A Day in the Life of a Geologist

- Module 2: Dynamic Earth:
 - Labs:
 - Rock Classification
 - Reconstructing Pangaea
 - Reconstructing Gondwana
 - Simulating Sonar
 - Living on the Edge
 - Fold Mountains
 - Fault-Block Mountains
 - Shake, Rattle, and Roll
 - Breaking Rocks
 - Rock Reactions
 - Go With the Flow
 - Blowing Breezes
 - Rock Detail
 - Settle Down
 - Metamorphic Sandwich
 - Sonar Mapping
 - Investigations:
 - A Surprising Fit
 - The Continental Drift Hypothesis
 - Wegener's Thorn
 - Under the Sea
 - Stripes on the Seafloor
 - Seafloor Spreading
 - A Tale of Two Mountain Ranges
 - Take Cover
 - Bye-Bye Beach
 - Ice Cube Glaciers
 - Glacial Shaping
 - Sugar Rocks
 - Stick To It
 - Rock Cycle
 - Gizmo: Ocean Mapping
 - Gizmo: Rock Cycle
 - Gizmo: Building Pangaea
 - Gizmo: Rock Classification
 - Gizmo: Plate Tectonics
 - Gizmo: Weathering
 - Phenomena / CER: Earth's Motion
 - Phenomena / CER: Earth's Crust
 - Phenomena / CER: Moving Plates
 - Phenomena / CER: What is Erosion?
 - Phenomena / CER: What is a Rock?
 - STEM:
 - Challenge: Rockin' Around the Park
 - Career Exploration: Gondwana
- Module 3: Distribution of Earth's Resources:
 - Labs:
 - Identifying Resources
 - Daily Resource Use
 - Spill the Beans

- Mineral Mining
 - Coal Mining
 - Investigations:
 - It Comes From the Land
 - Charted Waters
 - Location, Location, Location
 - Digging In
 - It's A Slippery Slope
 - Between a Rock and a Hard Place
 - Striking Oil
 - Fill the Void
 - Deeper Understandings
 - Going, Going, Gone
 - Farewell Fossil Fuels
 - Out of Sight, Out of Mind
 - Phenomena / CER: Renewable or Not?
 - Phenomena / CER: Resource Location
 - Phenomena / CER: Resource Extraction
 - STEM:
 - Challenge: Where in the World?
 - Career Exploration: Billions of Years in the Making
- Module 4: Natural Hazards:
 - Labs:
 - Damage Detective
 - Liquid Foundation
 - The Dangers of Mount Rainier
 - Investigations:
 - Tornado Alley
 - Hurricane Mapping
 - Hot Spots: Mapping the Hawaiian Islands
 - Around the World
 - Magnitude Measurement
 - Accuracy Counts
 - Beware of the Wave
 - Risky Regions
 - Predicting Patterns
 - The Next Big Quake
 - Earthquake Safety
 - Mitigating Effects
 - Volcano Patterns
 - Danger Zones
 - Cascades Erupting
 - Predict the Eruption
 - Volcanic Technologies
 - In the Billions
 - Locating the Risk
 - Gone with the Wind
 - A Slew of Cyclones
 - Twisting in the Wind
 - Predict the Risk
 - Drought Predictions
 - Flood Hazards

- Severe Weather Prediction
- Mitigating Severe Weather
- Gizmo: Earthquake Proof Homes
- Gizmo: Flood and Storm Proof Homes
- Gizmo: Hurricane Motion
- Phenomena / CER: Earthquake Risks
- Phenomena / CER: Where Do Volcanoes Form?
- Phenomena / CER: It Will Never Happen Here!
- Phenomena / CER: Tracking Tornadoes
- STEM:
 - Engineering Challenge: Slippery Slopes
 - Engineering Challenge: Hurricane Houses
 - Career Exploration: Making A Computer Tsunami

Extensions:

- Gizmos:
 - Erosion Rates
 - STEM Case: Hydrologic Cycle
 - Rainfall and Bird Beaks
- Study Island Science STEELS:
 - Earth's History
 - Changes to the Earth's Surface
 - Plate Tectonics
 - The Rock Cycle
 - Evidence of Plate Motions
 - Distribution of Natural Resources
 - Humans and Natural Hazards
- [CK-12 Earth Science Flexbook](#)
 - Chpt. 17: Evolution and Populations
 - Chpt. 19: History of Life on Earth
- Relevant Current Events News Articles
- What If? Videos
- Crash Course Videos
- Escape Room Activity

Remediation:

- Small group instruction
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- Differentiated Worksheets / Practice Activities
- Additional Vocabulary Practice Activities
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Instructional Methods:

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- Google Slideshow Presentations
- Vocabulary Activities
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- Note Taking Strategies
- Modeling
- Station / Center Activities
- Exit Tickets
- Group Work
- Large / Small Group Instruction
- Spiraling Review Activities
- Differentiated Activities
- Blooket, Gimkit, and Kahoots

Materials & Resources:

- *Inspire Science: Earth and Space: Unit 4: The Changing Earth (Modules 1, 2, 3, and 4).*
- [CK-12 Earth Science Flexbook](#)
- [CK-12 Physical Science Flexbook](#)
- Gizmos
- Phet Interactive Simulations
- Study Island
- Lab / Investigation Materials
- Teacher Created Worksheets / Materials / Activities
- Edpuzzles
- Youtube Videos
- Teacher created Google docs, slideshows, and forms.

Assessments:

- Diagnostic Assessments:
 - Pre-Tests
 - Quizzes
 - Exit Tickets
 - Guided Practice Worksheets
 - Class Discussions
 - Mind Maps
- Formative Assessments:
 - CER Activities
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- Summative Assessments:
 - End-of-Unit Tests
 - Labs / Investigations / Gizmos
 - Module STEM Challenges