<table>
<thead>
<tr>
<th>Grade/Course: Eighth Grade Science</th>
<th>Timeframe: 20 days</th>
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</thead>
<tbody>
<tr>
<td><strong>Unit: (Description)</strong> Biology and Life Science: Characteristics of Life, Cells, Cell Cycle, Mitosis, Meiosis</td>
<td><strong>Resources:</strong> Textbooks, Worksheets, Videos, Power point, Lab</td>
</tr>
<tr>
<td><strong>Standards:</strong> Biological Sciences 3.1.A.1 3.1.A.2,3.1.A.3,3.1.A.4,3.1.A.5,3.1.A.6,3.1.A.7,3.1.A.8,3.1.A.9,3.1.B.1,3.1.A.2,3.1.A.3,3.1.A.4,3.1.A.5,3.1.A.6,3.1.C.1,3.1.A.2,3.1.A.3,3.1.A.4 Technology and Engineering Education 3.4.E.1, 3.4.E.2</td>
<td><strong>Competencies:</strong> Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system. Identify examples of the relationship(s) between structure and function in the living world. Identify examples of the relationship(s) between structure and function in the living world. Explain the steps to the scientific method. Measure substances using the metric system units. Convert units between the Metric System and the US customary system. Discuss the levels of Biological organization. Explain who was responsible for discovering cells. Discuss the cell theory. Identify the two cell types, their characteristics, and what makes them different. Explain the function of different cell parts. Explain the difference between plant and animal cells. Explain how eukaryotic cells can specialize. Describe the parts of the cell cycle.</td>
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**Concepts**
- There are structural and functional similarities and differences that characterize diverse living things.
- All living things are made up of smaller units called cells.
- Cells carry out the many functions needed to sustain life.
- Cells take in nutrients that they use to provide energy to carry out their life functions.
- Cells grow and divide thereby producing more cells.
- There are defining structures of cells for both plants and animals.
- Some organisms are made up of only one cell.
- Specialized cells perform specialized functions in multicellular organisms.
- Different body tissues and organs are made up of different kinds of cells.
- There is a relationship between structure and function at all biological levels of organization.
- All multicellular organisms have systems that interact with one another to perform specific functions and enable the organism to function as a whole.
- Disease affects the structures and/or functions of an organism.
• Discuss the phases of mitosis.
• Explain the importance of regulation in regards to the cell cycle.
• Discuss what causes cancer to occur in our bodies.
• Discuss the phases of meiosis.
• Compare and contrast mitosis and meiosis.

Essential Questions:
• What are the levels of organization from simple to most complex?
• Who discovered and coined the term “cells?”
• What are the three parts of the cell theory?
• What are the similarities and differences between prokaryotic and eukaryotic cells?
• What are the similarities and differences between eukaryotic plant and animal cells?
• Explain the steps involved in the cell cycle and what occurs during each step.
• What happens when cells lose regulation of the cell cycle?
• Explain the difference between benign and malignant.

Big Ideas:
• The cell is the basic unit of structure and function for all living things.

Vocabulary: cell, meiosis, mitosis, DNA, RNA, gene, prokaryotic, eukaryotic, hybrid, mutate, benign, malignant

Assessment: Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

On-going Remediation: Compass Learning

On-Going Enrichment: Study Island

Grade/Course: Eighth Grade Science
<table>
<thead>
<tr>
<th>Unit: (Description)</th>
<th>Timeframe: 20 days</th>
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<tbody>
<tr>
<td>Genetics</td>
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<th>Standards:</th>
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<thead>
<tr>
<th>Concepts</th>
<th>Competencies</th>
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<tbody>
<tr>
<td>Every organism has a set of genetic instructions that determines its inherited traits.</td>
<td>Identify examples of the relationship(s) between structure and function in the living world.</td>
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<tr>
<td>The gene is the basic unit of inheritance.</td>
<td>Describe who was responsible for founding the principles of Genetics.</td>
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<table>
<thead>
<tr>
<th>Essential Questions:</th>
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<tbody>
<tr>
<td>Who was responsible for founding Genetics?</td>
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<tr>
<td>What is a gene?</td>
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<tr>
<td>What is an allele?</td>
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<tr>
<td>What can we use to predict the outcome of a genetic cross?</td>
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<tr>
<td>Compare and contrast Mendelian and Non-Mendelian inheritance.</td>
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<td>Compare monohybrid cross to a dihybrid cross.</td>
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<td>What is a karyotype?</td>
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<thead>
<tr>
<th>Big Ideas:</th>
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<tr>
<td>The cell is the basic unit of structure and function for all living things.</td>
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<thead>
<tr>
<th>Vocabulary:</th>
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<tbody>
<tr>
<td>DNA, RNA, gene, hybrid, mutate, Punnett Square, monohybrid, dihybrid, probability</td>
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<th>Assessment:</th>
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<tr>
<td>Study Island</td>
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**Grade/Course:** Eighth Grade Science  

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<tr>
<th>Unit: (Description)</th>
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<tbody>
<tr>
<td>Ecology</td>
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**Standards:**  

**Technology and Engineering Education** 3.4.E.1, 3.4.E.2

**Resources:**  
Textbooks  
Worksheets  
Videos  
Power point  
Lab

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<thead>
<tr>
<th>Concepts</th>
<th>Competencies</th>
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</table>
| • There is a relationship between structure and function at all biological levels of organization.  
• Disease affects the structures and/or functions of an organism.  
• Changes in environmental conditions can affect the survival of populations and entire species. | • Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system.  
• Identify examples of the relationship(s) between structure and function in the living world.  
• Describe the Ecological level of organization.  
• Explain factors that affect population size, population density, and migration.  
• Describe the water cycle.  
• Describe the carbon cycle.  
• Describe how energy flows through a system. |

**Essential Questions:**  
• What allows some populations of organisms to change and survive while others cannot?

**Big Ideas:**  
• The cell is the basic unit of structure and function for all living things.  
• Populations of organisms evolve by natural selection.

**Vocabulary:** Ecology, water cycle, carbon cycle, population density, population factors, food chain, producer, consumer, decomposer

**Assessment:** Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

**On-going Remediation:** Compass Learning

**On-going Enrichment:** Study Island
### Grade/Course: Eighth Grade Science

<table>
<thead>
<tr>
<th>Unit: (Description)</th>
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<tbody>
<tr>
<td>Earth Science</td>
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<th>Standards:</th>
<th>Resources:</th>
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<tbody>
<tr>
<td>Earth and Space Sciences 3.3.B.1, 3.3.B.2, 3.3.B.3</td>
<td>Worksheets</td>
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<tr>
<td>Technology and Engineering Education 3.4.B.1, 3.4.B.2, 3.4.D.1, 3.4.D.2, 3.4.D.3</td>
<td>Videos</td>
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<thead>
<tr>
<th>Concepts</th>
<th>Competencies</th>
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| - The Earth is mostly rock, with a metallic core, a thin layer of water covering about ¾ of the surface and surrounded by a thin blanket of air.  
- Everything on or near the earth is pulled toward Earth’s center by a gravitational force. Celestial revolutions are caused by gravitational attraction.  
- The rhythms of the Earth are caused by 3 celestial motions: The Earth’s rotation, revolution around the sun, and the Moons’ revolution around the Earth.  
- The Earth’s rotation around its tilted axis causes day and night.  
- The Earth’s revolution around the Sun causes the seasons and the year. Because of the Earth’s tilted axis, sunlight falls more intensely on different parts of the earth during different parts of the year, producing the seasons and seasonal patterns in weather.  
- The Moon’s revolution around the earth once in about 28 days changes what part of the moon is lighted by the sun and how much of that part we can see from the earth, giving rise to lunar phases.  
- Heat flow from the earth and motion within the earth lead the outer shell of the earth to move around in large rigid pieces (plates) and leads to the creation and destruction of ocean basins, motion of continents relative to one another, | - Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system.  
- Explain why earth has seasons.  
- Describe the motions that cause Moon phases.  
- List the various objects in the Solar System.  
- Describe important characteristics of each planet.  
- Explain how a star is born and its life cycle.  
- Determine how distances are measured in space. |
earthquakes, volcanic eruptions, and development of mountain belts.
- Earth materials (rocks and soils) can be classified by their composition and texture and those features can be interpreted to infer the history of the material.

### Essential Questions:
- What causes the great variation at Earth’s surface?

### Big Ideas:
- Solid, liquid and gaseous earth materials all circulate in large scale systems at a variety of time scales, giving rise to landscapes, the rock cycle, ocean currents, weather, and climate.

### Vocabulary:
- phases, planets, galaxy, stars, eclipses, umbra, penumbra, rotation, revolution, moon phases, astronomical unit

### Assessment:
- Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

### On-going Remediation:
- Compass Learning

### On-going Enrichment:
- Study Island

### Grade/Course: Eighth Grade Science

**Unit: (Description)**
Constellations and Galaxies

**Timeframe:**
15 days

**Standards:**
- Earth and Space Sciences 3.3.A.1, 3.3.A.2, 3.3.A.3, 3.3.A.4, 3.3.A.5, 3.3.A.6, 3.3.A.7, 3.3.A.8, 3.3.A.9, 3.3.B.1, 3.3.B.2, 3.3.B.3
- Technology and Engineering Education 3.4.B.1, 4.4.B.2, 3.4.D.1, 3.4.D.2, 3.4.D.3

**Resources:**
- Textbooks
- Worksheets
- Videos
- PowerPoint
- Lab

**Concepts**
- Groups of stars that move in unison in the night sky form constellations.
- Direct and remote sensing provides evidence that billions of star cluster into galaxies.
- The current theory as to the formation of the universe is known as the big bang theory.

**Competencies**
- Describe how a star’s electromagnetic spectrum can be used to characterize properties of the star.
- Explain the origin and composition of the solar system and universe.
- Describe the galaxies that make up the universe.
- Explain how a star is born and its life cycle.
- Determine how constellations are arranged in space.

**Essential Questions:**
- Where did all the material on earth come from?

**Big Ideas:**
- Stars have life cycles.

**Vocabulary:** nebula, spiral galaxy, elliptical galaxy, irregular galaxy, low mass star, black hole, high mass star, Neutron star, red giant, constellations, circumpolar constellation, galaxy, coronal mass ejection, prominence, flares, sun spots, H-R diagram

**Assessment:** Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

**On-going Remediation:** Compass Learning

**On-going Enrichment:** Study Island

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<tr>
<td><strong>Unit: (Description)</strong></td>
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<tr>
<td>Weather</td>
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<td><strong>Timeframe:</strong></td>
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<td><strong>Standards:</strong></td>
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<td>3.5.7.C</td>
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<td><strong>Resources:</strong></td>
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<td>PowerPoint</td>
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<td>Lab</td>
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**Concepts**
- The Earth’s revolution around the Sun causes the seasons and the year. Because of the Earth’s tilted axis, sunlight falls more intensely on different parts of the earth during different parts of the year, producing the seasons and seasonal patterns in weather.
- The cycling of water in and out of the atmosphere plays an important role in determining climatic patterns.
- The atmosphere circulates in large scale patterns which steer weather systems due to heat from the sun.
- Large scale wind patterns drive surface currents in the oceans and affects weather.

**Competencies**
- Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system.
- Discuss how clouds form and how they are classified.
- Describe the potential impact of human- made processes on changes to Earth’s resources and how they affect everyday life.
- Explain how pressure, temperature, moisture, and wind are used to describe atmospheric conditions that affect regional weather or climate.
- Describe the different forms of precipitation.
- Describe how weather is associated with fronts and high and low-pressure systems.
- Explain the different forms of severe weather.
- Describe the different types of air masses.

**Essential Questions:**
- What causes the great variation at Earth’s surface?

**Big Ideas:**
- Solid, liquid and gaseous earth materials all circulate in large scale systems at a variety of time scales, giving rise to landscapes, the rock cycle, ocean currents, weather, and climate.

**Vocabulary:** clouds, pressure, temperature, moisture, wind, precipitation, fronts, storms, seasons

**Assessment:** Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

**On-going Remediation:** Compass Learning

**On-going Enrichment:** Study Island

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**Grade/Course:** Eighth Grade Science

**Unit:** (Description) Motion and Forces

**Timeframe:** 15 days

**Standards:** 3.4.7.C

**Resources:**
- Textbooks
- Worksheets
- Videos
- PowerPoint
- Lab

**Concepts**
- An object will stay at rest or continue at a constant velocity unless acted upon by an external, unbalanced force.
- Unbalanced forces acting on an object cause changes in its velocity.
- Models (graphs) of an object’s velocity versus time can be used to infer the presence of absence of unbalanced forces.
- Two of the fundamental forces that exist in the universe are

**Competencies**
- Use appropriate technologies to make precise quantitative measurements and observations and to organize and analyze the data.
- Describe the relationships among the parts of a system, the ways that they work together, the flow of matter or energy through the system, and the feedback and control mechanism present in the system. Describe the effect of
gravity and electromagnetism.
- The gravitational force is a universal force that depends on how much mass the objects have and how far apart they are.
- The magnitude of the gravitational force is weight (oz, lb, newtons).

multiple forces on the movement, speed, or direction of an object.
- Identify types of forces.
- Describe the appropriate units of measure regarding forces.
- Explain how gravity influences motion.

**Essential Questions:**
- What causes objects to move?

**Big Ideas:**
- An object’s motion is the result of all forces acting on it.

**Vocabulary:** force, velocity, acceleration, mass, speed, friction, inertia, pressure, momentum, gravity

**Assessment:** Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

**On-going Remediation:** Compass Learning

**On-going Enrichment:** Study Island

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**Grade/Course:** Eighth Grade Science

**Unit:** Energy and Electricity

**Timeframe:** 20 days

**Standards:**
- 3.4.7.B

**Resources:**
- Textbooks
- Worksheets
- Videos
- PowerPoint
- Lab

**Concepts**
- Energy can be transformed within a system or transferred from one system to another (or from a system to its environment) in different ways. Thermal energy is transferred from warmer objects to cooler objects. Mechanical energy can be transferred when two objects push or pull on one another. Electromagnetic energy can be transferred when an electrical source such as a battery or generator is connected in a complete circuit to an electrical device. Chemical energy is transferred when particles are

**Competencies**
- Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system.
- Compare and contrast characteristics of celestial bodies found in the solar system.
- Explain the parts and functions of an electrical circuit.
- Identify circuits as being series or parallel.
- Calculate voltage, amperage, and Ohm’s in a circuit.
rearranged in a chemical reaction.
- Batteries store chemical energy and transform it into electrical energy.
- Identify sources of energy.

### Essential Questions:
- How do energy transformations explain that energy is neither created nor destroyed?

### Big Ideas:
- Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.

### Vocabulary:
circuit, series circuit, parallel circuit, static, induction, conduction, insulator, radiation, voltage, ampere, ohms

### Assessment:
Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

### On-going Remediation:
Compass Learning

### On-going Enrichment:
Study Island

### Grade/Course: Eighth Grade Science

**Unit:** Chemistry (Properties of Matter/Atoms)

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<th>Timeframe: 30 days</th>
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**Standards:**
3.4.7.A

**Resources:**
Textbooks, Worksheets, Videos, PowerPoint, Lab

### Concepts
- All matter is made up of particles, which are far too small to see directly through a microscope.
- Particles are always in motion with the smallest motion in solids progressing to the largest motion in gases.
- Materials are characterized by having a specific amount of mass in each unit of volume (density).

### Competencies
- Use models and patterns to make predictions, draw inferences, or explain scientific and technological concepts.
- Design, implement, record, explain, and justify safe and effective laboratory procedures to determine the relationship between two variables, controlling for other factors that might also affect the relationship.
- A substance has characteristic properties such as density, boiling point, freezing point, solubility, all of which are independent of the mass or volume of the sample.
- Changing a substance’s state of matter may change its density but not its composition.
- All matter is made up of building blocks called atoms. Atoms are characterized by their parts including protons, electrons, and neutrons.
- Elements are the basic building blocks of matter that cannot be broken down chemically and are made up of all of the same type of atoms.
- There are over one hundred known elements each with characteristic properties from which all other matter is made.

**Essential Questions:**
- How do scientists identify and sort materials?

**Big Ideas:**
- Matter has observable physical properties and the potential to mix and form new materials.

**Vocabulary:** matter, elements, compounds, mixtures, atom, nucleus, proton, neutron, electron, physical, chemical, chemical reaction, Periodic table, metals, non-metals, conductors, metalloids, groups, periods, atomic number, mass number, products, reactants, exothermic, endothermic, covalent bond, ionic bond, chemical bond

**Assessment:** Test, Quiz, Lab Work, Worksheets, Activities, Informal Assessment, Presentations, Projects

**On-going Remediation:** Compass Learning

**On-going Enrichment:** Study Island