

Grade 8 – Science Curriculum
Earth and Space Science
EARTH HISTORY

Earth and Space Science GLE	Student Friendly Language
<p>ESS4:7-8:1.1 Describe ways in which technology has increased our understanding of the world in which we live.</p>	<p>I can describe the different ways that technology has helped our understanding of the world around us.</p>
<p>ESS4:7-8:1.2 Recognize the importance of technology as it relates to science, for purposes such as access to space and other remote locations, sample collection and treatment, measurement, and data collection.</p>	<p>I know that technology is important to science to help us understand space, remote locations, sample collections, measurement, and data collection.</p>
<p>ESS4:7-8:2.1 Calculate temperature in degrees Celsius.</p>	<p>I can calculate the temperature in degrees Celsius.</p>
<p>ESS4:7-8:2.2 Perform calculations using metric measurements.</p>	<p>I can measure using the metric system.</p>
<p>ESS4:7-8:2.3 Describe how man uses land based light telescopes, radio telescopes, satellites, manned exploration, probes and robots to collect data.</p>	<p>I can describe how we use land based light telescopes, radio telescopes, satellites, manned exploration, probes and robots to collect data.</p>
<p>ESS4:7-8:3.1 Provide examples of how creative thinking and economic need has shaped the way people use natural materials, such as the use of metal ores petroleum and fresh water.</p>	<p>I know that we can find new ways to use natural materials when we think creatively or make money from doing it.</p>
<p>ESS4:7-8:3.2 Explain how to test natural materials to measure and compare their properties.</p>	<p>I can explain the different ways to test natural materials and to compare their properties.</p>
<p>ESS4:7-8:3.3 Explain how technologies can reduce the environmental impact of natural disasters.</p>	<p>I can explain how technology can reduce the environmental impact of natural disasters.</p>
<p>ESS4:7-8:3.4 Identify the potential impact of converting forested land to uses such</p>	<p>I can identify how changing forests to farms and other things will impact</p>

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as farms, homes, factories, or tourist attractions.

ESS4:7-8:4.1

Understand that some scientific careers involve the application of Earth and Space Science content knowledge and experience in specific ways that meet the goals of the job.

ESS1:7-8:1.2

Identify and describe the impact certain factors have on the Earth's climate, including changes in the oceans' temperature, changes in the composition of the atmosphere, and geological shifts due to events, such as volcanic eruptions and glacial movements.

ESS1:7-8:2.2

Use geological evidence provided to support the idea that the Earth's crust/lithosphere is composed of plates that move.

[ESS1(5-8)INQ+POC-1]

ESS1:7-8:2.1

Describe the layers of the Earth, including the core, mantle, lithosphere, hydrosphere, and atmosphere.

ESS1:7-8:3.1

Explain how fossils found in sedimentary rock can be used to support the theories of Earth's evolution over geologic time, and describe how the folding, breaking, and uplifting of the layers affects the evidence.

ESS1:7-8:4.1

Describe how catastrophic changes that have taken place on the Earth's surface can be revealed by satellite images.

the environment.

I know that what I learn in Earth and Space Science might be important to the job I choose in the future.

I can show you and describe things that affect the Earth's climate, like changes in ocean temperature, changes in the composition of atmosphere, geological shifts, volcanic eruptions, and glacial movements.

I can describe how satellite images have shown changes on the Earth's surface because of catastrophic events.

I can use data to show that the Earth's crust and lithosphere are made of plates that move.

I can explain how fossils found in sedimentary rock can be used as evidence of evolution. I also know that changes in the Earth's crust can affect that evidence.

I can describe how satellite images of Earth can show the drastic changes that have happened on Earth over a period of time.

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ESS1:7-8:5.1

Explain that the Earth's crust is divided into plates, which move at extremely slow rates in response to movements in the mantle.

ESS1:7-8:5.2

Explain how the Earth events, abruptly and over time, can bring about changes in the Earth's surface (e.g., landforms, ocean floor, rock features, or climate). [ESS1(5-8)POC-3]

ESS1:7-8:6.1

Describe the processes of the rock cycle.

ESS1:7-8:6.2

Explain that sedimentary, igneous, and metamorphic rocks contain evidence of the minerals, temperatures, and forces that created them.

ESS1:7-8:6.3

Explain how sediments of sand and smaller particles, which may contain the remains of organisms, are gradually buried and cemented together by dissolved minerals to form solid rock.

ESS4:7-8:3.2

Explain how to test materials to measure and compare their properties.

ESS1:7-8:6.4

Using data about a rock's physical characteristics make and support an inference about the rock's history and connection to the rock cycle. [ESS1(5-8)SAE+POC-5]

I know that the Earth's crust can be divided into plates. I know that those plates move extremely slowly because of the mantle.

I can explain how certain events change the Earth's surface quickly or slowly.

I can explain the rock cycle.

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Life Science GLE	Student Friendly Language
<p>LS2:7-8:3.2 Explain the process of respiration and differentiate between it and photosynthesis.</p>	<p>I can explain the cell respiration. I can also tell the differences between cell respiration and photosynthesis.</p>
<p>LS1:7-8:2.2 Define a population and describe the factors that can affect it.</p>	<p>I can define “population” and describe factors that affect it.</p>
<p>LS1:7-8:2.4 Explain relationships between or among the structure and function of the cells, tissues, organs, and organ systems in an organism.</p>	<p>I can explain the relationships, structures and functions of cells, tissues, organs and organ systems within an organism.</p>
<p>LS1:7-8:3.6 Compare and contrast sexual reproduction with asexual reproduction.</p>	<p>I can compare and contrast sexual reproduction with asexual reproduction.</p>
<p>LS1:7-8:3.7 Using data provided, select evidence that supports the concept that genetic information is passed on from both parents to offspring.</p>	<p>When given data, I can use it to find proof that genetic information is passed on from both parents to offspring.</p>
<p>LS2:7-8:2.1 Explain how food provides energy and materials for growth and repair of body parts.</p>	<p>I can explain how the food provides energy and materials for growth. I can also explain how it repairs body parts.</p>
<p>LS4:7-8:1.1 Recognize that unlike human beings, behavior in insects and many other species is determined almost entirely by biological inheritance.</p>	<p>I know that unlike learned behavior in humans, behavior in many species is almost entirely by biological inheritance.</p>
<p>LS4:7-8:1.2 Explain that organism's behavioral response is a reaction to internal or and environmental stimuli, and that these responses may be determined by heredity or from past experience.</p>	<p>I can explain that how an organism responds to a situation depends on its internal and/or environmental influences. I know that how it responds may be determined by heredity or by its past experiences.</p>
<p>LS4:7-8:1.3 Explain how all behavior is affected by both inheritance and experience.</p>	<p>I can explain how behavior is affected by both inheritance and experience.</p>

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<p>LS3:7-8:3.1 Recognize that hereditary information is contained in genes, which are located in the chromosomes of each cell, and explain that inherited traits can be determined by either one or many genes, and that a single gene can influence more than one trait, such as eye and hair color.</p>	<p>I know that our cells hold hereditary information in their chromosomes. I know that the traits we inherit can be determined by one or by many chromosomes.</p>
<p>LS4:7-8:3.2 Recognize that the characteristics of an organism can be described in terms of a combination of traits, and explain that some traits are inherited while others result from interactions with the environment.</p>	<p>I know that the characteristics of an organism can be described in terms of a combination of traits. I can explain that some traits are inherited and some we develop by interacting with our environment.</p>
<p>LS3:7-8:2.3 Use a model, classification system, or dichotomous key to illustrate, compare, or interpret possible relationships among groups of organisms (e.g., internal and external structures, anatomical features)</p>	<p>I can illustrate, compare or interpret possible relationships among groups of organisms with a model, classification system or a dichotomous key.</p>
<p>LS3:7-8:3.5 Cite examples supporting the concept that certain traits of organisms may provide a survival advantage in a specific environment and therefore, an increased likelihood to produce offspring.</p>	<p>I can give examples that support the idea that certain traits of living things help give them an advantage to survive in a particular environment. I can also use that information to show that they will be more likely to produce offspring.</p>
<p>LS3:7-8:3.4 Recognize that humans are able to control some characteristics of plants and animals through selective breeding; and explain how this results in small differences between the parents and offspring, which can accumulate in successive generations so that decedents are very different from their ancestors.</p>	<p>I know that humans are able to control some of the characteristics of plants and animals through selective breeding. I can explain how we can cause small differences between parents and offspring. I can show that over several generations, these small changes can make a big difference between the decedents and their ancestors.</p>
<p>LS1:7-8:1.1 Recognize that similarities among organisms are found in anatomical features and patterns of development, and explain how these can be used to infer the degree of relatedness among organisms.</p>	<p>I know that similarities among organisms are found in body structure and how they develop. I can explain how these changes can be used to determine how related the two organisms are to one another.</p>
<p>LS2:7-8:3.1 Identify autotrophs as producers who may use photosynthesis and describe this as the basis of the food web.</p>	<p>I can identify autotrophs. I know their importance to the food web.</p>

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<p>LS4:7-8:2.1 Explain that the human body has ways to defend itself against disease causing organisms and describe how defenders, including tears, saliva, the skin, some blood cells and stomach secretions support the defense process.</p>	<p>I can describe ways in which the body protects itself from disease causing organisms.</p>
<p>LS4:7-8:2.2 Recognize that there are some diseases that human beings can only get once, and explain how many diseases can be prevented by vaccination.</p>	<p>I know that there are some diseases that humans can only get once. I can explain how many diseases can be prevented by vaccination.</p>
<p>LS4:7-8:2.3 Explain how vaccines induce the body to build immunity to a disease without actually causing the disease itself.</p>	<p>I can explain how vaccines cause the body to build immunity to a disease without actually causing it.</p>
<p>LS4:7-8:2.4 Recognize a healthy body cannot fight all germs invade it, and explain how some germs interfere with the body's defenses.</p>	<p>I know that the body cannot fight all germs that invade it. I can explain how some of these germs interfere with the body's defenses.</p>
<p>LS4:7-8:3.1 Compare patterns of human development are similar to those of other vertebrates.</p>	<p>I can find patterns between human development and the development of other vertebrates.</p>
<p>LS1:7-8:1.2 Describe or compare how different organisms have mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance (e.g., cells, tissues, organs and systems).</p>	<p>I can describe how different living things have certain mechanisms that work together to help that living thing to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance.</p>
<p>LS1:7-8:2.3 Explain why it is beneficial for an organism to be able to regulate its internal environment while living in a constantly changing external environment.</p>	<p>I can explain the benefits of being “warm blooded”.</p>
<p>LS5:7-8:1.1 Explain ways technology has influenced the course of history, as it relates to agriculture, sanitation and medicine.</p>	<p>I can explain ways in which technology has changed history.</p>

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<p>LS5:7-8:1.2 Provides examples of ways technology is used to protect the environment, such as using bacteria to clean water.</p> <p>LS5:7-8:2.1 Recognize and provide examples of how technology has enhanced the study of life sciences, as in the development of advanced diagnosing equipment improving medicine.</p> <p>LS5:7-8:3.1 Explain the necessity of, and purpose for the proper disposal of medical products</p> <p>LS5:7-8:3.2 Give examples of how increased understanding of biology has led to improvements in biotechnology, such as scientific methods for increasing the yield or pest-resistance of important food crops.</p> <p>LS5:7-8:3.3 Describes ways biotechnology helps humans, including improved health and medicine</p> <p>LS5:7-8:4.1 Understand that some scientific jobs/careers involve the application of life science knowledge and experience in specific ways that meet the goals of the job.</p>	<p>I can give examples of ways technology can be used to protect the environment.</p> <p>I can give examples of how technology has helped us understand life sciences. I know that some of those examples include developing medicines.</p> <p>I can explain why it is important to properly dispose of medical products.</p> <p>I can give examples of how biotechnology has improved.</p> <p>I can describe ways that biotechnology has helped humans.</p> <p>I know that what I learn here might be important to the job I choose someday.</p>
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Physical Science GLE	Student Friendly Language
<p>PS1:7-8:1.5 Identify methods used to separate mixtures into their component parts, such as boiling, filtering, chromatography and screening.</p>	<p>I know different ways to separate mixtures into their smaller parts.</p>
<p>PS1:7-8:1.6 Given graphic or written information, classify matter as atom/molecule or element/compound (Not the structure of an atom)</p>	<p>I can sort matter as atoms/molecules or as elements/compounds using graphs or written information.</p>
<p>PS1:7-8:2.1 Differentiate between volume and mass and define density</p>	<p>I know the difference between volume and mass. I can define density.</p>
<p>PS1:7-8:2.2 Explain how different substances of equal volume usually have different weights.</p>	<p>I can explain how things with the same volume usually have different weights.</p>
<p>PS1:7-8:2.3 Identify a molecule as the smallest part of a substance that retains its properties.</p>	<p>I know that the smallest part of a substance is a molecule.</p>
<p>PS1:7-8:2.4 Investigate the relationships among mass, volume and density.</p>	<p>I can investigate the relationships among mass, volume and density.</p>
<p>PS1:7-8:2.5 Given data about characteristic properties of matter (e.g., melting and boiling points, density, solubility) identify, compare, or classify different substances.</p>	<p>I can identify, compare or sort different substances when I'm given information about their characteristics.</p>
<p>PS2:7-8.1.1 Explain how substances react chemically with other substances to form new substances, known as compounds and that in such recombinations, the properties of the new substances may be very different from those of the old.</p>	<p>I can explain how substances react chemically with other substances to form new substances. I know that the new substances are known as compounds that may have very different properties from the original substances.</p>

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<p>PS2:7-8:1.2 Identify factors that affect reaction rates, such as temperature, concentration and surface area, and explain that dissolving substances in liquids often accelerates up reaction rates.</p> <p>PS2:7-8:1.3 Explain that oxidation involves the combining of oxygen with another substance, as in burning or rusting.</p> <p>PS2:7-8:1.4 Explain that states of matter depend on the arrangement of the molecules and their motion.</p> <p>PS2:7-8:2.2 Collect data or use data provided to infer or predict that the total amount of mass in a closed system stays the same, regardless of how substances interact (conservation of matter).</p> <p>PS2:7-8:3.2 Recognize how the Sun acts as a major source of energy for the Earth, and describes how it affects the planet's surface.</p> <p>PS4:7-8:1.1 Understand that design features, such as size, shape, weight, and function, must be considered when designing new technology.</p> <p>PS4:7-8:2.1 Demonstrate appropriate use of tools, such as rulers, calculators, balances, and graduated cylinders to measure and calculate volume and mass.</p> <p>PS4:7-8:3.1 Explain how humans use natural resources, such as flowing water and burning of coal, oil, or natural gas to generate electrical energy in power plants.</p> <p>PS4:7-8:3.2</p>	<p>I can name different ways to speed up or slow down a chemical reaction.</p> <p>I can explain the process of oxidation.</p> <p>I can explain the different states of matter and the arrangement of the molecules that causes the differences.</p>
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Describe how natural resources, such as coal, oil and natural gas are tapped for use in power plants, and how alternative sources, such as solar, wind, water, nuclear are tapped for power, and compare the advantages and disadvantages of each source.

PS4:7-8:3.3

Differentiate between durable good, which are designed to operate for a long period of time, and non-durable goods, which are only intended to operate for a short period of time.

PS4:7-8:4.1

Understand that some scientific jobs/careers involve the application of physical science content knowledge and experience in specific ways that meet the goals of the job.

PS1:7-8:2.6

Represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter.

PS1:7-8:1.1

Explain that atoms often combine to form a molecule or formula unit (crystal).

PS1:7-8:1.2

Recognize that elements can combine in a variety of ways to form compounds.

PS1:7-8:1.3

Differentiate between an atom and a molecule.

PS1:7-8:1.4

Differentiate between a mixture and a pure substance.

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PS1:7-8:1.5

Identify methods used to separate mixtures into their component parts, such as boiling, filtering, chromatography, and screening.

PS4:7-8:1.1

Understand that design features, such as size, shape, weight, and function, must be considered when designing new technology.

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Demonstrate appropriate use of tools, such as rulers, calculators, balances, and graduated cylinders to measure and calculate volume and mass.

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Explain how humans use natural resources, such as flowing water and burning of coal, oil, or natural gas to generate electrical energy in power plants.

PS4:7-8:3.2

Describe how natural resources, such as coal, oil and natural gas are tapped for use in power plants, and how alternative sources, such as solar, wind, water, nuclear are tapped for power, and compare the advantages and disadvantages of each source.

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