7th Grade

Science Curriculum

(weekly)

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| **Month** | **Week** | **Big Idea** | | **Essential Questions** | **Concepts** | **Competencies** | **Vocabulary** | **Standard** | **Eligible Content** |
| **August** | 26th-29th-scientific method | 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.  The cell is the basic unit of structure and function for all living things.  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.  An object’s motion is the result of all forces acting on it.  Matter has observable physical properties and the potential to mix and form new materials.  Populations of organisms evolve by natural selection. | | What causes the great variation at Earth’s surface?  How can one cell function as an organism?  How do energy transformations explain that energy is neither created nor destroyed?  What causes objects to move?  How do scientists identify and sort materials?  What allows some populations of organisms to change and survive while others cannot? | The Scientific Method can be used to solve scientific problems and questions for any science topic. | 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. | Hypothesis  Conclusion  Procedure  data | 3.2.7, 3.2.10 | S8 A.1.1.1  S8A1.1.2  S8 A 1.1.3  S8A.1.1.4 |
| **Sept.** | 2-5-scientific method | 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.  The cell is the basic unit of structure and function for all living things.  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.  An object’s motion is the result of all forces acting on it.  Matter has observable physical properties and the potential to mix and form new materials.  Populations of organisms evolve by natural selection. | | What causes the great variation at Earth’s surface?  How can one cell function as an organism?  How do energy transformations explain that energy is neither created nor destroyed?  What causes objects to move?  How do scientists identify and sort materials?  What allows some populations of organisms to change and survive while others cannot? | The Scientific Method can be used to solve scientific problems and questions for any science topic. | 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. | Hypothesis  Conclusion  Procedure  data | 3.2.7, 3.2.10 | S8 A.1.1.1  S8A1.1.2  S8 A 1.1.3  S8A.1.1.4 |
| **Sept** | 8th-12th-measuring/metric system | Matter has observable physical properties and the potential to mix and form new materials.  An object’s motion is the result of all forces acting on it. | | What causes objects to move?  How do scientists identify and sort materials? | Mass is a measure of the amount of matter in an object.  Materials are characterized by having a specific amount of mass in each unit of volume (density). | Use appropriate technologies to make precise quantitative measurements and observations and to organize and analyze the data.  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. | Mass,  Volume,  Density  Weight | 3.2.7, 3.2.10 | S8.A.1.3.1, S8.A.1.3.2, S8.A.2.1.1, S8.A.2.1.2, S8.A.2.1.4, S8.A.2.2.1, S8.A.2.2.2 |
| **Sept** | 15th-19th-measuring/metric system | Matter has observable physical properties and the potential to mix and form new materials.  An object’s motion is the result of all forces acting on it. | | What causes objects to move?  How do scientists identify and sort materials? | Mass is a measure of the amount of matter in an object.  Materials are characterized by having a specific amount of mass in each unit of volume (density). | Use appropriate technologies to make precise quantitative measurements and observations and to organize and analyze the data.  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. | Mass,  Volume,  Density  Weight | 3.2.7, 3.2.10 | S8.A.1.3.1, S8.A.1.3.2, S8.A.2.1.1, S8.A.2.1.2, S8.A.2.1.4, S8.A.2.2.1, S8.A.2.2.2 |
| **Sept** | 22nd-25th-measuring /metric system | Matter has observable physical properties and the potential to mix and form new materials.  An object’s motion is the result of all forces acting on it. | | What causes objects to move?  How do scientists identify and sort materials? | Mass is a measure of the amount of matter in an object.  Materials are characterized by having a specific amount of mass in each unit of volume (density). | Use appropriate technologies to make precise quantitative measurements and observations and to organize and analyze the data.  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. | Mass,  Volume,  Density  Weight | 3.2.7, 3.2.10 | S8.A.1.3.1, S8.A.1.3.2, S8.A.2.1.1, S8.A.2.1.2, S8.A.2.1.4, S8.A.2.2.1, S8.A.2.2.2 |
| **Sept.** | 29th-Oct.3rd- cells | The cell is the basic unit of structure and function for all living things. | | How can one cell function as an organism? | 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.  There are defining structures of cells for both plants and animals. | Identify examples of the relationship(s) between structure and function in the living world.  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. | Cell  Microscope  Cell theory  Cell wall  Cell membrame  Nucleus  Organelle  Ribosome  Cytoplasm  Mitochondria  Endoplasmic reticulum  Golgi apparatus  Vacuole  Chloroplast  Lysosome  Multicellular  Tissue organ organ system | 3.3.7  3.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1  S8.B.1.1.1, S8.B.1.1.3, S8.B.1.1.4 |
| **Oct.** | 6th-10th | The cell is the basic unit of structure and function for all living things. | | How can one cell function as an organism? | 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.  There are defining structures of cells for both plants and animals. | Identify examples of the relationship(s) between structure and function in the living world.  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. | Cell  Microscope  Cell theory  Cell wall  Cell membrame  Nucleus  Organelle  Ribosome  Cytoplasm  Mitochondria  Endoplasmic reticulum  Golgi apparatus  Vacuole  Chloroplast  Lysosome  Multicellular  Tissue organ organ system | 3.3.7  3.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1  S8.B.1.1.1, S8.B.1.1.3, S8.B.1.1.4 |
| **Oct.** | 13-15 | The cell is the basic unit of structure and function for all living things. | | How can one cell function as an organism? | 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. | Identify examples of the relationship(s) between structure and function in the living world.  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. | Element  Compound  Carbohydrate  Lipid  Protein  Enzyme  Nucleic acid  DNA  Double helix | 3.3.7  3.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1  S8.B.1.1.1, S8.B.1.1.3, S8.B.1.1.4 |
| **Oct.** | 20-24 | The cell is the basic unit of structure and function for all living things. | | How can one cell function as an organism? | 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. | Identify examples of the relationship(s) between structure and function in the living world.  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. | Element  Compound  Carbohydrate  Lipid  Protein  Enzyme  Nucleic acid  DNA  Double helix  Selectively permeable  Passive transport  Diffusion  Osmosis  Active transport  Endocytosis  exocytosis | 3.3.7  3.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1  S8.B.1.1.1, S8.B.1.1.3, S8.B.1.1.4 |
| **Oct.** | 27-31 | The cell is the basic unit of structure and function for all living things. | | How can one cell function as an organism? | 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. | Identify examples of the relationship(s) between structure and function in the living world.  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. | Carbohydrate  Lipid  Protein  Enzyme  Nucleic acid  DNA  Double helix  Selectively permeable  Passive transport  Diffusion  Osmosis  Active transport  Endocytosis  exocytosis | 3.3.7  3.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1  S8.B.1.1.1, S8.B.1.1.3, S8.B.1.1.4 |
| **Nov.** | 3-7 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | The gene is the basic unit of inheritance.  Every organism has a set of genetic instructions that determines its inherited traits.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  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 one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Heredity  Trait  Genetics  Fertilization  Purebred  Gene  Allele  Dominant allele  Recessive allele  Hybrid | 3.3.7  3.3.10  4.1.6  4.1.7 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1  S8.B.1.1.1, S8.B.1.1.3, S8.B.1.1.4 |
| **Nov.** | 10-14 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | Hereditary information (set of instructions) is contained in genes, located on chromosomes in cells.  Individual organisms with certain traits are more likely than others to survive and have offspring.  Every organism has a set of instructions for specifying its traits.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion.  Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Probability  Punnet square  Phenotype  Genotype  Homozygous  Heterozygous | 3.3.7  3.3.10  4.1.6  4.1.7 | [S8.B.1.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27551?cf=y), [S8.B.1.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27553?cf=y), [S8.B.1.1.4](http://www.pdesas.org/Standard/StandardsBrowser#27554?cf=y) |
| **Nov.** | 17-21 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | Hereditary information (set of instructions) is contained in genes, located on chromosomes in cells.  Individual organisms with certain traits are more likely than others to survive and have offspring.  Every organism has a set of instructions for specifying its traits.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion.  Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Probability  Punnet square  Phenotype  Genotype  Homozygous  Heterozygous | 3.3.7  3.3.10  4.1.6  4.1.7 | [S8.B.1.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27551?cf=y), [S8.B.1.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27553?cf=y), [S8.B.1.1.4](http://www.pdesas.org/Standard/StandardsBrowser#27554?cf=y) |
| **Nov.** | 24-25 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | Organisms reproduce and pass their genes to the next generation (their offspring).  Genes can randomly change or mutate, causing changes in certain traits of the offspring.  Changes in environmental conditions can affect the survival of populations and entire species.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion.  Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Probability  Punnet square  Phenotype  Genotype  Homozygous  Heterozygous | 3.3.7  3.3.10  4.1.6  4.1.7 | [S8.B.1.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27551?cf=y), [S8.B.1.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27553?cf=y), [S8.B.1.1.4](http://www.pdesas.org/Standard/StandardsBrowser#27554?cf=y) |
| **Dec.** | 3-5 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | Organisms reproduce and pass their genes to the next generation (their offspring).  Genes can randomly change or mutate, causing changes in certain traits of the offspring.  Changes in environmental conditions can affect the survival of populations and entire species.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion.  Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Probability  Punnet square  Phenotype  Genotype  Homozygous  Heterozygous  Incomplete dominance  Codominance  Multiple alleles  Polygenic inheritance  meiosis | 3.3.7  3.3.10  4.1.6  4.1.7 | [S8.B.1.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27551?cf=y), [S8.B.1.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27553?cf=y), [S8.B.1.1.4](http://www.pdesas.org/Standard/StandardsBrowser#27554?cf=y) |
| **Dec.** | 8-12 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | Organisms reproduce and pass their genes to the next generation (their offspring).  Genes can randomly change or mutate, causing changes in certain traits of the offspring.  Changes in environmental conditions can affect the survival of populations and entire species.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion. Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Probability  Punnet square  Phenotype  Genotype  Homozygous  Heterozygous  Incomplete dominance  Codominance  Multiple alleles  Polygenic inheritance  meiosis | 3.3.7  3.3.10  4.1.6  4.1.7 | [S8.B.1.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27551?cf=y), [S8.B.1.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27553?cf=y), [S8.B.1.1.4](http://www.pdesas.org/Standard/StandardsBrowser#27554?cf=y) |
| **Dec.** | 15-19 | Populations of organisms evolve by natural selection.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What allows some populations of organisms to change and survive while others cannot?  How do adaptations enable an organism to survive? | Inherited traits can increase their frequency in successive generations so that descendents are very different from their ancestors.  Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered.  Adaptations develop over time and are passed from one generation to the next. | Identify examples of the relationship(s) between structure and function in the living world.  Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion.  Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Compare and contrast organisms with very specific needs with those organisms that have more general requirements.  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them. | Probability  Punnet square  Phenotype  Genotype  Homozygous  Heterozygous  Incomplete dominance  Codominance  Multiple alleles  Polygenic inheritance  meiosis | 3.3.7  3.3.10  4.1.6  4.1.7 | [S8.B.1.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27551?cf=y), [S8.B.1.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27553?cf=y), [S8.B.1.1.4](http://www.pdesas.org/Standard/StandardsBrowser#27554?cf=y) |
| **Jan.** | 5-9 | 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. | | What causes the great variation at Earth’s surface? | The cycling of water in and out of the atmosphere plays an important role in determining climatic patterns. | 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. | Habitat  Groundwater  Water cycle  Evaporation  Condensation  Transpiration  Precipitation  Tributary  Watershed  Divide  Reservoir  eutrophication | 3.5.7  3.5.10  4.2.6  4.2.7 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **Jan.** | 12-16 | 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. | | What causes the great variation at Earth’s surface? | The cycling of water in and out of the atmosphere plays an important role in determining climatic patterns. | 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. | Habitat  Groundwater  Water cycle  Evaporation  Condensation  Transpiration  Precipitation  Tributary  Watershed  Divide  Reservoir  eutrophication | 3.5.7  3.5.10  4.2.6  4.2.7 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **Jan.** | 19-22 | 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. | | What causes the great variation at Earth’s surface? | The circulation of the ocean and atmosphere carries heat energy and has a strong influence on climate around the world.  Large scale wind patterns drive surface currents in the oceans and affects weather. | 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. | Permeable  Impermeable  Unsaturated zone  Saturated zone  Water table  Aquifer  Artesian well  wetland | 3.5.7  3.5.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **Jan.** | 26-30 | 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. | | What causes the great variation at Earth’s surface? | The circulation of the ocean and atmosphere carries heat energy and has a strong influence on climate around the world.  Large scale wind patterns drive surface currents in the oceans and affects weather. | 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. | Salinity  Sonar  Seamount  Trench  Continental shelf  Abyssal plain  Mid-ocean ridge  Wave  Longshore drift  Rip current  Groin  Current  Coriolis Effect  Climate  El Nino  Intertidal zone  Neritic zone  Open-ocean zone  Plankton  Benthos  Nekton | 3.5.7  3.5.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **Feb.** | 2-6 | 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. | | What causes the great variation at Earth’s surface? | The circulation of the ocean and atmosphere carries heat energy and has a strong influence on climate around the world.  Large scale wind patterns drive surface currents in the oceans and affects weather | 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. | Salinity  Sonar  Seamount  Trench  Continental shelf  Abyssal plain  Mid-ocean ridge  Wave  Longshore drift  Rip current  Groin  Current  Coriolis Effect  Climate  El Nino  Intertidal zone  Neritic zone  Open-ocean zone  Plankton  Benthos  Nekton | 3.5.7  3.5.10 | [S8.B.3.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27567?cf=y), [S8.B.3.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27569?cf=y), [S8.C.2.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27587?cf=y), [S8.C.2.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27589?cf=y), [S8.C.2.2.1](http://www.pdesas.org/Standard/StandardsBrowser#27591?cf=y) |
| **Feb.** | 9-13 | 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. | | What causes the great variation at Earth’s surface? | The atmosphere circulates in large scale patterns which steer weather systems due to heat from the sun. | 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. | Weather  Atmosphere  Water vapor  Air pressure  Barometer  Altitude  Troposphere  Stratosphere  Mesosphere  Thermosphere  Ionosphere  exosphere | 3.5.7  3.5.10 | [S8.B.3.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27567?cf=y), [S8.B.3.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27569?cf=y), [S8.C.2.1.1](http://www.pdesas.org/Standard/StandardsBrowser#27587?cf=y), [S8.C.2.1.3](http://www.pdesas.org/Standard/StandardsBrowser#27589?cf=y), [S8.C.2.2.1](http://www.pdesas.org/Standard/StandardsBrowser#27591?cf=y) |
| **Feb.** | 17-20 | 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. | | What causes the great variation at Earth’s surface? | The atmosphere circulates in large scale patterns which steer weather systems due to heat from the sun.  Interaction of circulating air masses gives rise to a wide variety of weather phenomena including fronts, mid-latitude cyclones (and anti-cyclones), and severe weather (tropical storms, tornados, severe thunderstorms, etc.). | 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. | Electromagnetic waves  Radiation  Greenhouse effect  Temperature  Thermal energy  Heat  Convection  Conduction  Convection currents  Wind  Anemometer  Windchill  Local winds  Global winds  latitude | 3.5.7  3.5.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **Feb.** | 23-27 | 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. | | What causes the great variation at Earth’s surface? | The atmosphere circulates in large scale patterns which steer weather systems due to heat from the sun.  Interaction of circulating air masses gives rise to a wide variety of weather phenomena including fronts, mid-latitude cyclones (and anti-cyclones), and severe weather (tropical storms, tornados, severe thunderstorms, etc.). | 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. | Electromagnetic waves  Radiation  Greenhouse effect  Temperature  Thermal energy  Heat  Convection  Conduction  Convection currents  Wind  Anemometer  Windchill  Local winds  Global winds  latitude | 3.5.7  3.5.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **March** | 2-5 | 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. | | What causes the great variation at Earth’s surface? | Interaction of circulating air masses gives rise to a wide variety of weather phenomena including fronts, mid-latitude cyclones (and anti-cyclones), and severe weather (tropical storms, tornados, severe thunderstorms, etc.). | 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. | Water cycle  Humidity  Relative humidity  Psychrometer  Dew point  Cirrus  Cumulus  Stratus  Air mass  Jet stream  Front  Occluded  Cyclone  Strom  Hurricane  Tornado | 3.5.7  3.5.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1 |
| **March** | 16-20 Living things/environment, populations | Living things depend on their habitat to meet their basic needs.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What factors affect an organism's ability to meet its needs?  How do adaptations enable an organism to survive? | Animal populations change over time.  Plants and animals are uniquely adapted to their environment.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered. Organisms have basic needs for survival.  Habitats can be lost or altered through natural processes or human activities. | Discuss how one species may adapt to environmental change while another may not.  Use evidence to explain factors that affect changes in populations. (e.g., deforestation, disease, land use).  Identify PA plants and animals that are threatened and endangered, and describe ways to protect them.  Describe the response of organism to environmental changes and how those changes affect survival (e.g., habitat loss, climate change). | Organism  Habitat  Biotic factor  Abiotic factor  Species  Population  Community  Ecosystem  Ecology  Birth rate  Death rate  Immigration  Emigration  Population density  Limiting factor  Carrying capacity  Natural selection  Adaptation  Niche  Competition  Predation | 4.1.7 |  |
| **March** | 23-27 | Living things depend on their habitat to meet their basic needs.  The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment. | | What factors affect an organism's ability to meet its needs?  How do adaptations enable an organism to survive? | Animal populations change over time.  Plants and animals are uniquely adapted to their environment.  One species may adapt to environmental change while another may not, making it more susceptible to becoming endangered. Organisms have basic needs for survival.  Habitat loss effects both the interaction among species and the population of a species.  Habitats can be lost or altered through natural processes or human activities.  There should be a balance between living and non-living components of the ecosystem (e.g., enough food to support the number of animals.  Limiting factors affect ecosystems. | Describe the response of organism to environmental changes and how those changes affect survival (e.g., habitat loss, climate change).  Describe how changing the balance of living and nonliving things can affect the ecosystem. | Organism  Habitat  Biotic factor  Abiotic factor  Species  Population  Community  Ecosystem  Ecology  Birth rate  Death rate  Immigration  Emigration  Population density  Limiting factor  Carrying capacity  Natural selection  Adaptation  Niche  Competition  Predation | 4.1.7 |  |
| **March** | 30-31relationships | Living things depend on their habitat to meet their basic needs. | | What factors affect an organism's ability to meet its needs? | Producers, consumers and decomposers have niches in an ecosystem.  Predator/prey relationships have a role in an ecosystem. | Explain predator/prey relationships and the unique roles of producers/consumers and decomposers.  Describe the response of organism to environmental changes and how those changes affect survival (e.g., habitat loss, climate change).  Describe how changing the balance of living and nonliving things can affect the ecosystem. | Predator  Prey  Symbiosis  Mutualism  Commensalism  Parasitism  Parasite  Host  Succession  Primary succession  Pioneer species  Secondary succession | 4.1.7 |  |
| **April** | 7-10-relationships/energy flow | Living things depend on their habitat to meet their basic needs. | | What factors affect an organism's ability to meet its needs? | Producers, consumers and decomposers have niches in an ecosystem.  Predator/prey relationships have a role in an ecosystem. | Explain predator/prey relationships and the unique roles of producers/consumers and decomposers.  Describe the response of organism to environmental changes and how those changes affect survival (e.g., habitat loss, climate change).  Describe how changing the balance of living and nonliving things can affect the ecosystem. | Predator  Prey  Symbiosis  Mutualism  Commensalism  Parasitism  Parasite  Host  Succession  Primary succession  Pioneer species  Secondary succession | 4.1.7 |  |
| **April** | 13-17 relationships/energy flow | Living things depend on their habitat to meet their basic needs. | | What factors affect an organism's ability to meet its needs? | Producers, consumers and decomposers have niches in an ecosystem.  Predator/prey relationships have a role in an ecosystem. | Explain predator/prey relationships and the unique roles of producers/consumers and decomposers.  Describe the response of organism to environmental changes and how those changes affect survival (e.g., habitat loss, climate change).  Describe how changing the balance of living and nonliving things can affect the ecosystem. | Predator  Prey  Symbiosis  Mutualism  Commensalism  Parasitism  Parasite  Host  Succession  Primary succession  Pioneer species  Secondary succession  Producer  Consumer  Herbivore  Food chain  Food web | 4.1.7 |  |
| **April** | 20-24-natural resources | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future. | | Why is the sustainable use of natural resources necessary? | Raw materials come from natural resources.  Resources are either renewable or nonrenewable.  Natural resources are found in specific locations on the earth.  Sustainable use of natural resources is essential for the survival of humans and other organisms. | Identify renewable and nonrenewable resources and describe their uses in providing humans with energy, food, housing and water and the waste derived from them.   |  |  | | --- | --- | |  | Identify the locations of different concentrations of fossil fuels and mineral resources, their time spans for renewability and how consumption affects their availability. |   Analyze the effects of management practices on natural resources. | Natural resource  Pollution  Point source  Nonpoint source  Renewable resource  Nonrenewable resource  Sustainable use  Ecological footprint  Conservation  Biodiversity  Endangered species  Habitat destruction  Fragmentation  Poaching  Captive breeding | 4.3.7 |  |
| **April** | 27-May 1-natural resources | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future. | | Why is the sustainable use of natural resources necessary? | Raw materials come from natural resources.  Resources are either renewable or nonrenewable.  Natural resources are found in specific locations on the earth.  Sustainable use of natural resources is essential for the survival of humans and other organisms. | Identify renewable and nonrenewable resources and describe their uses in providing humans with energy, food, housing and water and the waste derived from them.   |  |  | | --- | --- | |  | Identify the locations of different concentrations of fossil fuels and mineral resources, their time spans for renewability and how consumption affects their availability. |   Analyze the effects of management practices on natural resources. | Natural resource  Pollution  Point source  Nonpoint source  Renewable resource  Nonrenewable resource  Sustainable use  Ecological footprint  Conservation  Biodiversity  Endangered species  Habitat destruction  Fragmentation  Poaching  Captive breeding | 4.3.7 |  |
| **May** | 4-8 natural resources | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future. | | Why is the sustainable use of natural resources necessary? | Raw materials come from natural resources.  Resources are either renewable or nonrenewable.  Natural resources are found in specific locations on the earth.  Sustainable use of natural resources is essential for the survival of humans and other organisms. | Identify renewable and nonrenewable resources and describe their uses in providing humans with energy, food, housing and water and the waste derived from them.   |  |  | | --- | --- | |  | Identify the locations of different concentrations of fossil fuels and mineral resources, their time spans for renewability and how consumption affects their availability. |   Analyze the effects of management practices on natural resources. | Natural resource  Pollution  Point source  Nonpoint source  Renewable resource  Nonrenewable resource  Sustainable use  Ecological footprint  Conservation  Biodiversity  Endangered species  Habitat destruction  Fragmentation  Poaching  Captive breeding | 4.4.7 |  |
| **May** | 11-15 natural resources | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future. | | Why is the sustainable use of natural resources necessary? | Raw materials come from natural resources.  Resources are either renewable or nonrenewable.  Natural resources are found in specific locations on the earth.  Sustainable use of natural resources is essential for the survival of humans and other organisms. | Explain society’s standard of living in terms of technological advancements and how these advancements impact our use of resources (e.g., agriculture, transportation, energy, production).  Identify renewable and nonrenewable resources and describe their uses in providing humans with energy, food, housing and water and the waste derived from them.   |  |  | | --- | --- | |  | Identify the locations of different concentrations of fossil fuels and mineral resources, their time spans for renewability and how consumption affects their availability. |   Analyze the effects of management practices on natural resources. | Natural resource  Pollution  Point source  Nonpoint source  Renewable resource  Nonrenewable resource  Sustainable use  Ecological footprint  Conservation  Biodiversity  Endangered species  Habitat destruction  Fragmentation  Poaching  Captive breeding | 4.4.7 |  |
| **May** | 18-21recycling and pollution | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future.  People acting individually and/or as groups influence the environment. | | Why is the sustainable use of natural resources necessary?  How do the actions of humans affect the environment? | Recycling and waste management have an effect on the available resources.  Technological advancements impact our use of resources.  The environment is impacted by the consumption of resources and generation of waste.  Improvement in knowledge and technology allows humans to better mange their environment. | Explain society’s standard of living in terms of technological advancements and how these advancements impact our use of resources (e.g., agriculture, transportation, energy, production).  Explain how the wise use and misuse of resources affects the environment.  Identify alternative actions that are used to reduce pollution (air, water, land).  Explain how the wise use and misuse of resources affects the environment.  Explain the long term effects of using integrated pest management on the environment (e.g., herbicides, natural predators, bio-genetics). | Litter  Topsoil  Subsoil  Nutrient depletion  Fertilizer  Desertification  Drought  Land reclamation  Municipal solid waste  Incineration  Pollutant  Recycling  Biodegradable  Hazardous waste  Emissions  Photochemical smog  Ozone  CFC  Groundwater  Pesticide  Sewage  Sediment  Fuel fossil fuel  Solar energy  Biomass fuel  Efficiency  Insulation  Energy conservation | 4.5.6  4.5.7 |  |
| **May** | 26-29- recycling and pollution | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future.  Environmental laws and regulations impact humans, the environment, and the economy in both positive and negative ways.  People acting individually and/or as groups influence the environment. | | Why is the sustainable use of natural resources necessary?  What are the effects of Environmental Laws on humans, the environment and the economy?  How do the actions of humans affect the environment? | Recycling and waste management have an effect on the available resources.  Technological advancements impact our use of resources.  Laws and questions can affect how we use the resources of our environment.  The environment is impacted by the consumption of resources and generation of waste.  Improvement in knowledge and technology allows humans to better mange their environment. | Explain society’s standard of living in terms of technological advancements and how these advancements impact our use of resources (e.g., agriculture, transportation, energy, production).  Compare and contrast how environmental laws and regulations impact humans, the environment, and the economy in both positive and negative ways.  Explain how the wise use and misuse of resources affects the environment.  Identify alternative actions that are used to reduce pollution (air, water, land).  Explain how the wise use and misuse of resources affects the environment.  Explain the long term effects of using integrated pest management on the environment (e.g., herbicides, natural predators, bio-genetics). | Litter  Topsoil  Subsoil  Nutrient depletion  Fertilizer  Desertification  Drought  Land reclamation  Municipal solid waste  Incineration  Pollutant  Recycling  Biodegradable  Hazardous waste  Emissions  Photochemical smog  Ozone  CFC  Groundwater  Pesticide  Sewage  Sediment  Fuel fossil fuel  Solar energy  Biomass fuel  Efficiency  Insulation  Energy conservation | 4.5.6  4.5.7 |  |
| **June** | 1-3- recycling and pollution | Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future.  Environmental laws and regulations impact humans, the environment, and the economy in both positive and negative ways.  People acting individually and/or as groups influence the environment. | | Why is the sustainable use of natural resources necessary?  What are the effects of Environmental Laws on humans, the environment and the economy?  How do the actions of humans affect the environment? | Recycling and waste management have an effect on the available resources.  Technological advancements impact our use of resources.  Laws and questions can affect how we use the resources of our environment.  The environment is impacted by the consumption of resources and generation of waste.  Improvement in knowledge and technology allows humans to better mange their environment. | Explain society’s standard of living in terms of technological advancements and how these advancements impact our use of resources (e.g., agriculture, transportation, energy, production).  Compare and contrast how environmental laws and regulations impact humans, the environment, and the economy in both positive and negative ways.  Explain how the wise use and misuse of resources affects the environment.  Identify alternative actions that are used to reduce pollution (air, water, land).  Explain how the wise use and misuse of resources affects the environment.  Explain the long term effects of using integrated pest management on the environment (e.g., herbicides, natural predators, bio-genetics). | Litter  Topsoil  Subsoil  Nutrient depletion  Fertilizer  Desertification  Drought  Land reclamation  Municipal solid waste  Incineration  Pollutant  Recycling  Biodegradable  Hazardous waste  Emissions  Photochemical smog  Ozone  CFC  Groundwater  Pesticide  Sewage  Sediment  Fuel fossil fuel  Solar energy  Biomass fuel  Efficiency  Insulation  Energy conservation | 4.5.6  4.5.7 |  |
|  |  | |  | | | | | |  |