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. | HypothesisConclusionProceduredata | 3.2.7, 3.2.10 | S8 A.1.1.1S8A1.1.2S8 A 1.1.3S8A.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. | HypothesisConclusionProceduredata | 3.2.7, 3.2.10 | S8 A.1.1.1S8A1.1.2S8 A 1.1.3S8A.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,DensityWeight | 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,DensityWeight | 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,DensityWeight | 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. | CellMicroscopeCell theoryCell wallCell membrameNucleusOrganelleRibosomeCytoplasmMitochondriaEndoplasmic reticulumGolgi apparatusVacuoleChloroplastLysosomeMulticellularTissue organ organ system | 3.3.73.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1S8.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. | CellMicroscopeCell theoryCell wallCell membrameNucleusOrganelleRibosomeCytoplasmMitochondriaEndoplasmic reticulumGolgi apparatusVacuoleChloroplastLysosomeMulticellularTissue organ organ system | 3.3.73.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1S8.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. | ElementCompoundCarbohydrateLipidProteinEnzymeNucleic acidDNADouble helix | 3.3.73.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1S8.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 wholeDisease 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. | ElementCompoundCarbohydrateLipidProteinEnzymeNucleic acidDNADouble helixSelectively permeablePassive transportDiffusionOsmosisActive transportEndocytosisexocytosis | 3.3.73.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1S8.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 wholeDisease 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. | CarbohydrateLipidProteinEnzymeNucleic acidDNADouble helixSelectively permeablePassive transportDiffusionOsmosisActive transportEndocytosisexocytosis | 3.3.73.3.10 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1S8.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. | HeredityTraitGeneticsFertilizationPurebredGeneAlleleDominant alleleRecessive alleleHybrid | 3.3.73.3.104.1.64.1.7 | S8.B.3.1.1, S8.B.3.1.3, S8.C.2.1.1, S8.C.2.1.3, S8.C.2.2.1S8.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. | ProbabilityPunnet squarePhenotypeGenotypeHomozygousHeterozygous | 3.3.73.3.104.1.64.1.7 | [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. | ProbabilityPunnet squarePhenotypeGenotypeHomozygousHeterozygous | 3.3.73.3.104.1.64.1.7 | [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. | ProbabilityPunnet squarePhenotypeGenotypeHomozygousHeterozygous | 3.3.73.3.104.1.64.1.7 | [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. | ProbabilityPunnet squarePhenotypeGenotypeHomozygousHeterozygousIncomplete dominanceCodominanceMultiple allelesPolygenic inheritancemeiosis | 3.3.73.3.104.1.64.1.7 | [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. | ProbabilityPunnet squarePhenotypeGenotypeHomozygousHeterozygousIncomplete dominanceCodominanceMultiple allelesPolygenic inheritancemeiosis | 3.3.73.3.104.1.64.1.7 | [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. | ProbabilityPunnet squarePhenotypeGenotypeHomozygousHeterozygousIncomplete dominanceCodominanceMultiple allelesPolygenic inheritancemeiosis | 3.3.73.3.104.1.64.1.7 | [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. | HabitatGroundwaterWater cycleEvaporationCondensationTranspirationPrecipitationTributaryWatershedDivideReservoireutrophication | 3.5.73.5.104.2.64.2.7 | 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. | HabitatGroundwaterWater cycleEvaporationCondensationTranspirationPrecipitationTributaryWatershedDivideReservoireutrophication | 3.5.73.5.104.2.64.2.7 | 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. | PermeableImpermeableUnsaturated zoneSaturated zoneWater tableAquiferArtesian wellwetland | 3.5.73.5.10 | 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. | SalinitySonarSeamountTrenchContinental shelfAbyssal plainMid-ocean ridgeWaveLongshore driftRip currentGroinCurrentCoriolis EffectClimateEl NinoIntertidal zoneNeritic zoneOpen-ocean zonePlanktonBenthosNekton | 3.5.73.5.10 | 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. | SalinitySonarSeamountTrenchContinental shelfAbyssal plainMid-ocean ridgeWaveLongshore driftRip currentGroinCurrentCoriolis EffectClimateEl NinoIntertidal zoneNeritic zoneOpen-ocean zonePlanktonBenthosNekton | 3.5.73.5.10 | [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. | WeatherAtmosphereWater vaporAir pressureBarometerAltitudeTroposphereStratosphereMesosphereThermosphereIonosphereexosphere | 3.5.73.5.10 | [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 wavesRadiationGreenhouse effectTemperatureThermal energyHeatConvectionConductionConvection currentsWindAnemometerWindchillLocal windsGlobal windslatitude | 3.5.73.5.10 | 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 wavesRadiationGreenhouse effectTemperatureThermal energyHeatConvectionConductionConvection currentsWindAnemometerWindchillLocal windsGlobal windslatitude | 3.5.73.5.10 | 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 cycleHumidityRelative humidityPsychrometerDew pointCirrusCumulusStratusAir massJet streamFrontOccludedCycloneStromHurricaneTornado | 3.5.73.5.10 | 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). | OrganismHabitatBiotic factorAbiotic factorSpeciesPopulationCommunityEcosystemEcologyBirth rateDeath rateImmigrationEmigrationPopulation densityLimiting factorCarrying capacityNatural selectionAdaptationNicheCompetitionPredation | 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. | OrganismHabitatBiotic factorAbiotic factorSpeciesPopulationCommunityEcosystemEcologyBirth rateDeath rateImmigrationEmigrationPopulation densityLimiting factorCarrying capacityNatural selectionAdaptationNicheCompetitionPredation | 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. | PredatorPreySymbiosisMutualismCommensalismParasitismParasiteHostSuccessionPrimary successionPioneer speciesSecondary 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. | PredatorPreySymbiosisMutualismCommensalismParasitismParasiteHostSuccessionPrimary successionPioneer speciesSecondary 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. | PredatorPreySymbiosisMutualismCommensalismParasitismParasiteHostSuccessionPrimary successionPioneer speciesSecondary successionProducerConsumerHerbivoreFood chainFood 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.

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|  | 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 resourcePollutionPoint sourceNonpoint sourceRenewable resourceNonrenewable resourceSustainable useEcological footprintConservationBiodiversityEndangered speciesHabitat destructionFragmentationPoachingCaptive 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.

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|  | 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 resourcePollutionPoint sourceNonpoint sourceRenewable resourceNonrenewable resourceSustainable useEcological footprintConservationBiodiversityEndangered speciesHabitat destructionFragmentationPoachingCaptive 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.

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|  | 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 resourcePollutionPoint sourceNonpoint sourceRenewable resourceNonrenewable resourceSustainable useEcological footprintConservationBiodiversityEndangered speciesHabitat destructionFragmentationPoachingCaptive 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.

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|  | 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 resourcePollutionPoint sourceNonpoint sourceRenewable resourceNonrenewable resourceSustainable useEcological footprintConservationBiodiversityEndangered speciesHabitat destructionFragmentationPoachingCaptive 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 TopsoilSubsoilNutrient depletionFertilizerDesertificationDroughtLand reclamationMunicipal solid wasteIncinerationPollutantRecyclingBiodegradableHazardous wasteEmissionsPhotochemical smogOzoneCFCGroundwaterPesticideSewageSedimentFuel fossil fuelSolar energyBiomass fuelEfficiencyInsulationEnergy conservation | 4.5.64.5.7 |  |
| **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 TopsoilSubsoilNutrient depletionFertilizerDesertificationDroughtLand reclamationMunicipal solid wasteIncinerationPollutantRecyclingBiodegradableHazardous wasteEmissionsPhotochemical smogOzoneCFCGroundwaterPesticideSewageSedimentFuel fossil fuelSolar energyBiomass fuelEfficiencyInsulationEnergy conservation | 4.5.64.5.7 |  |
| **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 TopsoilSubsoilNutrient depletionFertilizerDesertificationDroughtLand reclamationMunicipal solid wasteIncinerationPollutantRecyclingBiodegradableHazardous wasteEmissionsPhotochemical smogOzoneCFCGroundwaterPesticideSewageSedimentFuel fossil fuelSolar energyBiomass fuelEfficiencyInsulationEnergy conservation | 4.5.64.5.7 |  |
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