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| 7th Grade Science Curriculum Document Quarter 1 |
| Physical Science 1: Matter and its Interactions |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.PS1.6- Create and interpret models of substances whose atoms represent the states of matter with respect to temperature and pressure.** |
| 1-Week of QuarterPercent of TNReady | **Sub Objectives:** * We can describe how matter and atoms are related.
* We can compare the arrangement of atoms to the states of matter.

**Learning Outcomes*** We can create a model of a substance whose atoms represent the states of matter with respect to temperature.
* We can create a model of a substance whose atoms represent the states of matter with respect to pressure.
* We can interpret a model of a substance whose atoms represent the states of matter with respect to temperature.
* We can interpret a model of a substance whose atoms represent the states of matter with respect to pressure.

**Activities**:* We can describe how pressure and temperature effect the state of matter of a substance using cause and effect.
* We can create a model of the arrangement of atoms in the different states of matter with temperature and pressure.
 | Remedial States of Matter game: <http://www.abcya.com/states_of_matter.htm> Matter sorter: <https://www.brainpop.com/games/mattersorter/>Atoms and states of matter: <https://learn.concord.org/resources/3/states-of-matter>Harcourt School States of Matter: (Atom arrangement in the states of matter)<https://www.harcourtschool.com/activity/states_of_matter/>  | **CROSSCUTTING CONCEPT:Cause and Effect** *Students infer and identify cause and effect relationships from patterns.***SCIENCE AND ENGINEERING PRINCIPLE:Developing and using models** *Students create models which are responsive and incorporate features that are not visible in the natural world, but have implications on the behavior of the modeled systems and can identify limitations of their models.* |
| Physical Science 1: Matter and its Interactions |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.PS1.1- Develop and use models to illustrate the structure of atoms, including the subatomic particles with their relative positions and charges** |
| 1 Week of Quarter\_\_\_% of TNReady | **Sub Objectives:*** We can identify and describe the subatomic parts of an atom including protons, neutrons, and electrons based on their positions and charges.

**Learning Outcomes:*** We can develop models to illustrate the structure of atoms and include the subatomic particles with their positions and charges.
* We can use models to identify the subatomic particles by their positions and charges.

**Activities:** * We can identify and describe the subatomic parts of an atom including protons, neutrons, and electrons using the Plum Pudding Model and Bohr Models.
* We can create a model that represent the sub atomic particles of an atom, their positions, and charges.
 | Build an Atom:<https://phet.colorado.edu/sims/html/build-an-atom/latest/build-an-atom_en.html> Name the atom based on its properties:<https://www.learner.org/interactives/periodic/basics_interactive.html> Article and Quiz about the parts of an atom:<http://www.chem4kids.com/files/atom_structure.html> Bohr Model Animation:<http://science.sbcc.edu/physics/flash/siliconsolarcell/bohratom.swf> Atomic Theory:<http://www.csun.edu/science/courses/619/flash/models_of_atom.swf>  | **CROSSCUTTING CONCEPT:Structure and Function** *Students begin to attribute atomic structure and interactions between* *particles to the properties of a material.***SCIENCE AND ENGINEERING PRINCIPLE:****Developing and using models** *Students create models which are responsive and incorporate features that are not visible in the natural world, but have implications on the behavior of the modeled systems and can identify limitations of their models* |
| Physical Science 1: Matter and its Interactions |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.PS1.5- Use the periodic table as a model to analyze and interpret evidence relating to physical and chemical properties to identify a sample of matter** |
| 2 Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:*** We can use the periodic table to identify an element.
* We can describe the properties of metals.
* We can describe how ions form.
* We can describe how atoms are held together in a covalent bond.

**Learning Outcomes:*** We can use the periodic table to identify a sample of matter by its physical properties.
* We can use the periodic table to identify a sample of matter by its chemical properties.

**Activities*** We can use the periodic table to identify a substance based on its physical and chemical properties
* We can describe the common patterns that form in the periods, rows, and families in the Periodic Table of Elements.
* We can identify similarities in physical and chemical properties of compounds formed from a metal and non-metal (ionic) and a compound formed from a pair of non-metals (molecular)
 | Information about all elements on the periodic table: <https://education.jlab.org/itselemental/index.html> Ionic Bonding:<https://www.learner.org/interactives/periodic/groups_interactive.html> Interactive Covalent bonding:<https://tn.pbslearningmedia.org/resource/lsps07.sci.phys.matter.covalentbond/covalent-bonding/#.WwRsVbYlQXo>  | **CROSSCUTTING CONCEPT: Pattern** *Students recognize, classify, and record patterns for macroscopic phenomena based on microscopic structure.***SCIENCE AND ENGINEERING PRINCIPLE: Analyzing and interpreting data***Students should create and analyze graphical presentations of data to identify linear and non-linear relationships, and consider statistical features within data and evaluate multiple data sets for a single phenomenon.* |
| Physical Science 1: Matter and its Interactions |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.PS1.3- Classify matter as pure substances or mixtures based on composition.** |
| 1 Week of Quarter\_\_\_% of TNReady | **Sub Objectives:*** We can describe the properties of a pure substance and mixture.
* We can give examples of pure substances and mixtures.

**Learning Outcomes:*** We can classify matter as a pure substance or mixture based on its composition.

**Activity:*** We can classify matter as a mixture or pure substance and give evidence to support our claim.

  | Animation and information about pure substances and mixtures: <https://courses.lumenlearning.com/boundless-chemistry/chapter/classification-of-matter/> Animation mixtures and pure substances:<http://mocomi.com/pure-substances-and-mixtures/> Tutorial mixture and pure substances:<http://www.cpalms.org/Public/PreviewResourceStudentTutorial/Preview/164890>   | **CROSSCUTTING CONCEPT: Pattern** *Students recognize, classify, and record patterns for macroscopic phenomena based on microscopic structure.***SCIENCE AND ENGINEERING PRINCIPLE: Engaging in argument from evidence***Students present an argument based on empirical evidence, models, and invoke scientific reasoning.* |
| Physical Science 1: Matter and its Interactions |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.PS1.2- Compare and contrast elemental molecules and compound molecules** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:*** We can identify and describe elemental molecules and compound molecules.
* We can differentiate between monatomic elements and diatomic elements.
* We can differentiate between molecules of a diatomic element and compound molecules.

**Learning Outcomes:*** We can compare and contrast elemental molecules and compound molecules.

**Activities:** * We can differentiate between monatomic elements and diatomic elements by giving examples and completing a T chart.
* We can compare and elemental molecules and compound molecules using a double Venn Diagram.
 | Molecule builders:<https://games.legendsoflearning.com/games/WyJnYW1lcyIsNjE5XQ>== Molecules and Compounds:<https://games.legendsoflearning.com/games/WyJnYW1lcyIsMTE0MF0>= Molecule maker:<https://games.legendsoflearning.com/games/WyJnYW1lcyIsNDQ1XQ>==  | **CROSSCUTTING CONCEPT: Scale, Proportion, and Quantity***Students develop models to investigate scales that are beyond normal experiences.***SCIENCE AND ENGINEERING PRINCIPLE: Analyzing and interpreting data.***Students form explanations using sources (including student-developed investigations) which show comprehension of parsimony, utilize quantitative and qualitative models to make predictions, and can support or cause revisions of a particular conclusion* |
| Physical Science 1: Matter and its Interactions |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.PS1.4- Analyze and interpret chemical reactions to determine if the total number of atoms in the reactants and products support the Law of Conservation of Mass.** |
| \_2\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:*** We can identify and describe physical and chemical reactions.
* We can use models to identify information included in chemical equations and balance the chemical equation.
* We can describe and calculate density.
* We can explain the Law of Conservation of Mass.

**Learning Outcomes:*** We can interpret chemical reactions to determine if the total number of atoms in the reactions and products support the Law of Conservation of Mass.
* We can analyze chemical reactions to determine if the total number of atoms in the reactants and products support the Law of Conservation of Mass.

**Activities**: * We can demonstrate a chemical and physical change and describe how it shows the Law of Conservation of Mass.
* We can explain how balancing chemical equations and calculating the mass of the products and reactants supports the Law of Conservation of Mass.

  | Balancing equations game: <https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_en.html> Calculate density interactive animation: <https://phet.colorado.edu/en/simulation/density> Density video: <http://www.discoveryeducation.com/STEM/water/density.cfm> Law of Conservation of Mass game: <http://home.utah.edu/~u0577548/Conservation%20of%20Matter/sum_of_parts.htm>  | **CROSSCUTTING CONCEPT: Energy and Matter***Students demonstrate conservation of mass in physical and chemical changes.***SCIENCE AND ENGINEERING PRINCIPLE: Analyzing and interpreting data.***Students should create and analyze graphical presentations of data to identify linear and non-linear relationships, consider statistical features within data and evaluate multiple data sets for a single phenomenon.* |
| 7th Grade Science Curriculum Document Quarter 2 |
| Earth and Space Science 3: Earth and Human Activity |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.ESS3.2- Engage in a scientific argument through graphing and translating data regarding human activity and climate.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objective:** * We can develop a scientific explanation based on evidence to support how human activity effect the climate.

**Learning Outcomes*** We can engage in a scientific argument by graphing and translating data relating to human activity.
* We can engage in a scientific argument by graphing and translating data relating to climate.

**Activities:*** We can debate how human activity has had and will continue to have an effect on the climate.
* We can create graphs, tables, or charts that show a pattern of how different human activities have an impact on the climate.
 | Climate Change Information: <https://climate.nasa.gov/evidence/> Climate Change Animation: <https://www.weforum.org/agenda/2017/12/this-visualization-shows-20-years-of-earths-seasons-and-the-disturbing-impact-of-climate-change/> Climate Time Machine: <https://climatekids.nasa.gov/time-machine/> Climate Game: <https://games4sustainability.org/gamepedia/climate-game/>  | **CROSSCUTTING CONCEPT: Pattern** *Students recognize, classify, and record patterns in data, graphs, and charts.***SCIENCE AND ENGINEERING PRINCIPLE: Engaging in argument from evidence***Students present an argument based on empirical evidence, models, and invoke scientific reasoning.* |
| Earth and Space Science 3: Earth and Human Activity |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.ESS3.1- Graphically represent the composition of the atmosphere as a mixture of gases and discuss the potential for atmospheric change.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objective:** * We can describe the composition of Earth’s atmosphere.

**Learning Outcomes*** We can graphically represent the composition of the atmosphere as a mixture of gases.
* We can discuss the potential for atmospheric change.

**Activities:*** We can create a graph that represents the mixture of gases in Earth’s atmosphere and use it to explain the potential for atmospheric change.
* We can illustrate a diagram of the layers of Earth’s atmosphere and explain the characteristics of each layer.
 | Earth’s atmosphere interactive diagram: <http://earthguide.ucsd.edu/earthguide/diagrams/atmosphere/index.html> Animation: Where do Earth’s Atmospheric Layers End and Space begin?<https://laughingsquid.com/where-does-space-begin/> Interactive Earth’s Atmospheric Layers:<http://sepuplhs.org/middle/iaes/students/simulations/sepup_atmosphere.html> Structure of Earth’s Atmosphere:<http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES14/ES14.html> Info on Earth’s Atmosphere: <https://www.space.com/17683-earth-atmosphere.html>  | **CROSSCUTTING CONCEPT: Stability and Change** *Students make explanations of stability and change discussing molecular components of a system.***SCIENCE AND ENGINEERING PRINCIPLE: Analyzing and interpreting data.***Students should create and analyze graphical presentation of data to identify linear and non-linear relationships, consider statistical features within data and evaluate multiple data sets for a single phenomenon.*  |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.4- Diagram the hierarchical organization of multicellular organisms from cells to organism.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objective:** * We can describe the levels of organization in living things.

**Learning Outcomes*** We can diagram the levels of organization of multicellular organisms from cells to organism.

**Activities:*** We can create a flow chart that shows the levels of organization between cells to organism.
 | Levels of Organization Animation:<https://www.cengage.com/biology/discipline_content/animations/organization.html> Levels of Organization Information: <http://utahscience.oremjr.alpine.k12.ut.us/sciber00/7th/cells/sciber/levelorg.htm>Build an Organ Game:<https://www.centreofthecell.org/learn-play/games/build-an-organ/> Explore a Cell:<https://www.centreofthecell.org/learn-play/games/explore-a-cell/> What is a Cell: Shows how cells work together<https://www.centreofthecell.org/learn-play/games/>  | **CROSSCUTTING CONCEPT: Systems and System Models** *Students evaluate the sub-systems that may make up a larger system.***SCIENCE AND ENGINEERING PRINCIPLE: Developing and Using Models***Students create models which are responsive and incorporate features that are not visible in the natural world, but have implications on the behavior of the modeled systems and can identify limitations of their models.*  |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.1- Develop and construct models that identify and explain the structure and function of major cell organelles as they contribute to the life activities of the cell and organism.** |
| \_2\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can identify and describe all major organelles of a plant and animal cell.
* We can compare the main parts of a cell to the parts of a factory or school.

**Learning Outcomes*** We can develop a model that explains the structure and function of major cell organelles.
* We can construct a model that explains the structure and function of major cell organelles.
* We can identify the structure and function of major cell organelles.
* We can explain the structure and function of major cell organelles as they contribute to the life activities of the cell and organism.

**Activities:*** We can create a model of a cell that shows all the major organelles of a plant or animal cell and describes their function.
 | Cell Rap: <https://www.youtube.com/watch?v=-zafJKbMPA8> Plant Cell Tutorial<http://www.sheppardsoftware.com/health/anatomy/cell/cell_tutorial.htm> Plant Cell Game:<http://www.sheppardsoftware.com/health/anatomy/cell/plant_cell_game.htm>Animal Cell Tutorial:<http://www.sheppardsoftware.com/health/anatomy/cell/cell_tutorial.htm> Animal Cell Game: <http://www.sheppardsoftware.com/health/anatomy/cell/cell_game.htm>  | **CROSSCUTTING CONCEPT: Systems and System Models** *Students develop models for systems which include both visible and invisible inputs and outputs for that system.***SCIENCE AND ENGINEERING PRINCIPLE: Developing and Using Models***Students create models which are responsive and incorporate features that are not visible in the natural world, but have implications on the behavior of the modeled systems and can identify limitations of their models.*  |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.9- Construct a scientific explanation based on compiled evidence for the processes of photosynthesis of cellular respiration, and anaerobic respiration in the cycling of matter and flow of energy into and out of organisms.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can explain how plants get their energy from the Sun.
* We can explain what happens in plant and animal cells during cellular respiration.

**Learning Outcomes:** * We can construct a scientific explanation based on evidence for the process of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
* We can construct a scientific explanation based on evidence for the process of cellular respiration in the cycling of matter and flow of energy into and out of organisms.
* We can construct a scientific explanation based on evidence for the process of anaerobic respiration in the cycling of matter and flow of energy into and out of organisms

**Activities:*** We can use models to describe what happens during photosynthesis.
* We can use models to explain what happens during cellular respiration.
* We can use a diagram to explain the how plants and animals depend on each other.
 | Amoeba Sister Photosynthesis Video: <https://www.youtube.com/watch?v=uixA8ZXx0KU> Amoeba Sisters Respiration Video: <https://www.youtube.com/watch?v=4Eo7JtRA7lg> Photosynthesis and Respiration Game: <https://biomanbio.com/HTML5GamesandLabs/PhotoRespgames/photoresphtml5page.html>  | **CROSSCUTTING CONCEPT: Systems and System Models** *Students develop models for systems which include both visible and invisible inputs and outputs for that system.***SCIENCE AND ENGINEERING PRINCIPLE: Planning and carrying out controlled investigations** *Students begin to investigate independently, select appropriate independent variables to explore a dependent variable, and recognize the value of failure and revision in the experimental process.* |
| Life Science 2: Ecosystems: Interactions, Energy, and Dynamics |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS2.1- Develop a model to depict the cycling of matter, including carbon and oxygen, including the flow of energy among biotic and abiotic parts of an ecosystem** |
| \_2\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can describe how the Carbon and Oxygen cycles are related.
* We can explain how Nitrogen moves through ecosystems.

**Learning Outcomes:** * We can develop a model to show the cycling of matter.
* We can develop a model to show the cycling of carbon and oxygen.
* We can develop a model to show the flow of energy among biotic and abiotic parts of an ecosystem.

**Activities:*** We can use a diagram to explain how carbon and oxygen are recycled.
* We can use a diagram to explain how Nitrogen moves through the ecosystem.
 | Abiotic and biotic factors in an ecosystem:<https://www.youtube.com/watch?v=E1pp_7-yTN4&feature=youtu.be> Information how biotic and abiotic factors interact in an ecosystem:<http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/science/continuum/Pages/environment.aspx> Nitrogen Cycle Game:<https://www.brainpop.com/games/nitrogencyclegame/> Nitrogen Cycle Animation:<https://www.classzone.com/books/ml_science_share/vis_sim/em05_pg20_nitrogen/em05_pg20_nitrogen.swf> Carbon Cycle Animation:<http://www.mhhe.com/biosci/bio_animations/MH13_CarbonCycle_Web/index.html>  | **CROSSCUTTING CONCEPT: Energy and Matter** *Students demonstrate conservation of mass in physical and chemical changes.***SCIENCE AND ENGINEERING PRINCIPLE: Developing and Using Models** *Students create models which are responsive and incorporate features that are not visible in the natural world, but have implications on the behavior of the modeled systems and can identify limitations of their models.* |
| 7th Grade Science Curriculum Document Quarter 3 |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.3- Evaluate evidence that cells have structural similarities and differences across kingdoms.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objective:** * We can explain how plant and animals share similar organelles.

**Learning Outcomes:** * We can evaluate evidence that cells have structural similarities and differences across kingdoms.

**Activities:*** We can use a double Venn diagram to compare and contrast plant and animal cells.
* We can complete a table that shows the similarities between plant and animal cells.
* We can use models of plant and animal cells to determine their similarities.
 | Interactive Cell Models:<https://www.cellsalive.com/cells/cell_model.htm> Cell Simulation: Plant and Animal Cell Builder<http://sepuplhs.org/high/sgi/teachers/cell_sim.html> Cell Game:<https://www.carolina.com/teacher-resources/Interactive/online-game-cell-structure-cellcraft-biology/tr11062.tr>  | **CROSSCUTTING CONCEPT: Pattern** *Students recognize, classify, and record patterns in data, graphs, and charts.***SCIENCE AND ENGINEERING PRINCIPLE: Engaging in argument from evidence***Students present an argument based on empirical evidence, models, and invoke scientific reasoning.* |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.2- Conduct an investigation to demonstrate how the cell membrane maintains homeostasis through the process of passive transport.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can explain how materials move into and out of the cell.
* We can differentiate between osmosis and diffusion.

**Learning Outcomes:** * We can conduct an investigation to show how the cell membrane maintains homeostasis through passive transport.

**Activities:*** We can complete a scientific investigation to determine how materials move during passive transport.
 | Gummy Bear Osmosis Lab:<https://ny24000063.schoolwires.net/cms/lib/NY24000063/Centricity/Domain/208/GummyBearOsmosisLab.pdf>Osmosis Video: Amoeba Sisters:<https://www.youtube.com/watch?v=IaZ8MtF3C6M> Diffusion Video: Amoeba Sisters<https://www.youtube.com/watch?v=Ptmlvtei8hw> Diffusion Video Handout: <https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_cell_transport_by_amoeba_sisters.pdf> Diffusion Animation:<https://authoring.concord.org/activities/12/pages/77/88a8dd15-8b14-4cb0-af05-e07ba893e091>  | **CROSSCUTTING CONCEPT: Stability and Change** *Students make explanations of stability and change discussing molecular components of a system.***SCIENCE AND ENGINEERING PRINCIPLE: Planning and carrying out controlling investigations***Students begin to investigate independently, select appropriate independent variables to explore a dependent variable and recognize the value of failure on revision in the experimental process.* |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.5- Explain that the body is a system comprised of subsystems that maintain equilibrium and support life through digestion, respiration, excretion, circulation, sensation (nervous and integumentary) and locomotion (musculoskeletal)** |
| \_2\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can explain how body systems work together to help us move, breath, and move materials within the body.
* We can define homeostasis.
* We can explain how the body systems interact to maintain homeostasis.

**Learning Outcomes:*** We can explain that the body is made up of subsystems that maintain equilibrium and support life through digestion.
* We can explain that the body is made up of subsystems that maintain equilibrium and support life through respiration.
* We can explain that the body is made up of subsystems that maintain equilibrium and support life through excretion.
* We can explain that the body is made up of subsystems that maintain equilibrium and support life through circulation.
* We can explain that the body is made up of subsystems that maintain equilibrium and support life through sensation.
* We can explain that the body is made up of subsystems that maintain equilibrium and support life through locomotion.

**Activities:*** We can identify what body systems are involved in determining our reaction time, explain their function, and gather data.
* We can identify what body systems are involved in finding our heart rate before and after aerobic activity, explain their function, and gather data.
 | Amoeba Sisters: Video: Body Systems<https://www.youtube.com/watch?v=gEUu-A2wfSE> Amoeba Sisters Video Handout: <https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_human_body_systems_by_amoeba_sisters_2.pdf> Tour of the Human Body- Information and activities:<http://www.educationworld.com/a_lesson/lesson065.shtml> Resources Human Body Systems:<https://www.carolina.com/teacher-resources/Interactive/human-body-systems/tr40161.tr> Reaction Time Lab:<http://www.nsta.org/publications/news/story.aspx?id=48510> Heart Rate Lab:<https://middleschoolscience.com/2015/01/27/heart-rate-lab/>  | **CROSSCUTTING CONCEPT: Systems and System Models***Students evaluate the sub-systems that may make up a larger system.***SCIENCE AND ENGINEERING PRINCIPLE: Constructing explanations and designing solutions.***Students form explanations using source (including student-developed investigations) which show comprehension of parsimony, utilize quantitative and qualitative models to make predictions, and can support or cause revisions of a particular conclusion.* |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.6- Develop an argument based on empirical evidence and scientific reasoning to explain how behavioral and structural adaptations in animals and plants affect the probability of their survival and reproductive success.** |
| \_2\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:*** We can identify and describe behavioral adaptations in plants.
* We can identify and describe structural adaptations in plants
* We can identify and describe structural adaptations in animals.
* We can identify and describe structural adaptations in animals.

**Learning Outcomes:** * We can develop an argument based on evidence and scientific reasoning to explain how behavioral adaptations in animals affect the probability of their survival and reproductive success.
* We can develop an argument based on evidence and scientific reasoning to explain how structural adaptations in animals affect the probability of their survival and reproductive success.
* We can develop an argument based on evidence and scientific reasoning to explain how behavioral adaptations in plants affect the probability of their survival and reproductive success.
* We can develop an argument based on evidence and scientific reasoning to explain how structural adaptations in plants affect the probability of their survival and reproductive success.

**Activities:*** We can give examples of how plants and animals are adapted to survive and support our claim with evidence.
* We can use deductive reasoning to determine the adaptions of an organism.
 | Amoeba Sister Video: Plant Structure and Adaptations:<https://www.youtube.com/watch?v=DGpPHrLF-5M&list=PLwL0Myd7Dk1F0iQPGrjehze3eDpco1eVz&index=46&t=0s> Free Bird Beak Adaptation Lab:<https://www.teacherspayteachers.com/Product/Bird-Beak-Adaptation-Lab-Middle-School-3292079> Plant Adaptations Activities:<https://www.handsontheland.org/grsa/resources/curriculum/elem/lesson28.htm>  | **CROSSCUTTING CONCEPT: Cause and Effect***Students infer and identify cause and effect relationships from patterns***SCIENCE AND ENGINEERING PRINCIPLE:** **Engaging in argument from evidence.***Students present an argument based on empirical evidence models and invoke scientific reasoning.*   |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.7- Evaluate and communicate evidence that compares and contrasts the advantages and disadvantages of sexual and asexual reproduction** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can identify and describe methods of sexual and asexual reproduction and give evidence to support our claim.
* We can identify the method that an organism reproduces as sexual or asexual.
* We can describe the advantages and disadvantages of sexual and asexual reproduction using cause and effect relationships.

**Learning Outcomes*** We can evaluate evidence that compares and contrasts the advantages and disadvantages of asexual reproduction.
* We can communicate evidence that compares and contrasts the advantages and disadvantages of asexual reproduction
* We can evaluate evidence that compares and contrasts the advantages and disadvantages of sexual reproduction
* We can communicate evidence that compares and contrasts the advantages and disadvantages of sexual reproduction

**Activities:*** We can compare and contrast asexual and sexual reproduction using a double Venn diagram.
 | Amoeba Sisters Video: Sexual and Asexual Reproduction <https://www.youtube.com/watch?v=fcGDUcGjcyk&list=PLwL0Myd7Dk1F0iQPGrjehze3eDpco1eVz&index=44&t=0s> Amoeba Sisters Video Handout:<https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_asexual_and_sexual_reproduction_by_amoeba_sisters_newheader.pdf> Sexual vs Asexual Reproduction Animation:<http://learn.genetics.utah.edu/content/basics/reproduction/> Investigating Reproductive Strategies:<http://teach.genetics.utah.edu/content/evolution/files/ReproductiveStrategies.pdf>  | **CROSSCUTTING CONCEPT: Cause and Effect***Students infer and identify cause and effect relationships from patterns.* **SCIENCE AND ENGINEERING PRINCIPLE:** **Obtaining, evaluating, and communicating information***(Observe) Students can evaluate text, media, and visual displays of information with the intent of clarifying claims and reconciling explanations. Students can communicate scientific information in writing utilizing embedded tables, charts,**figures, graphs* |
| Life Science 1: From Molecules to Organisms: Structure and Process |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS1.8-**  **Construct an explanation demonstrating that the function of mitosis for multicellular organisms is for growth and repair through the production of genetically identical daughter cells.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can explain why mitosis occurs.
* We can describe what occurs during each phase of Mitosis.

**Learning Outcomes:** * We can construct an explanation that the function of mitosis in multicellular organisms is for growth and repair by making genetically identical daughter cells.

**Activities:*** We can use diagrams to sequence the phases of the cell cycle and describe what is occurring in each phase.
* We can explain how the law of conservation of energy applies to mitosis.
 | Mitosis Animation:<https://biomanbio.com/HTML5GamesandLabs/Genegames/mitosismoverpage.html> Stages of Mitosis Game:<https://www.purposegames.com/game/stages-of-mitosis-quiz> Oreo Mitosis Lab:<http://studylib.net/doc/6894429/oreo-mitosis-student-worksheet-materials-needed--6-oreo-c>... Amoeba Sisters Mitosis Video:<https://www.youtube.com/watch?v=f-ldPgEfAHI> Amoeba Sisters Mitosis Handout:<https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_mitosis_v._2_by_amoeba_sisters.pdf> Identify the Stages of the Cell Cycle:<http://www.rigb.org/education/games/human-body/the-cell-cycle>  | **CROSSCUTTING CONCEPT: Energy and Matter***Students demonstrate conservation of mass in physical and chemical changes.***SCIENCE AND ENGINEERING PRINCIPLE:** **Constructing explanations and designing solutions***Students form explanations using source (including student-developed investigations) which show comprehension of parsimony, utilize quantitative and qualitative models to make predictions, and can support or cause revisions of a particular conclusion.* |
| 7th Grade Science Curriculum Document Quarter 4 |
| Life Science 3: Heredity: Inheritance and Variation of Traits |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS3.2-**  **Distinguish between mitosis and mitosis and meiosis and compare the resulting daughter cells.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can explain what type of cells are created during Mitosis and Meiosis.
* We can differentiate between mitosis and meiosis.
* We can recall the number of daughter cells created during mitosis and meiosis.

**Learning Outcomes:** * We can distinguish between mitosis and meiosis.
* We can compare the resulting daughter cells in mitosis and meiosis.

**Activities:*** We can explain the events that occur during mitosis using a cause and effect relationship.
* We can create a model of mitosis and explain what is occurring during each phase and how many daughter cells are created.
* We can create a model of meiosis and explain how many daughter cells are created.
* We can compare Mitosis and Meiosis using a T chart.
 | How Cells Divide Mitosis vs Meiosis: <https://tn.pbslearningmedia.org/resource/tdc02.sci.life.gen.mitosis/how-cells-divide-mitosis-vs-meiosis/#.WwWs_bYlQXo> Mitosis vs Meiosis Information and Quizzes: <http://www.softschools.com/difference/mitosis_vs_meiosis/130/> Resources Mitosis vs Meiosis:<http://www.nclark.net/MitosisMeiosis>  | **CROSSCUTTING CONCEPT: Cause and Effect** *Students infer and identify cause and effect relationships from patterns.***SCIENCE AND ENGINEERING PRINCIPLE: Developing and using models** *Students create models which are responsive and incorporate features that are not visible in the natural world, but have implications on the behavior of the modeled systems and can identify limitations of their models.* |
| Life Science 3: Heredity: Inheritance and Variation of Traits |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS3.3-**  Predict the probability of individual dominant and recessive alleles to be transmitted from each parent to offspring during sexual reproduction and represent the genotypic and phenotypic patterns using ratios. |
| \_2\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can describe and identify dominant and recessive traits.
* We can describe and identify homozygous and heterozygous traits.
* We can describe and identify genotypes and phenotypes.
* We can differentiate between dominant and recessive traits, genotypes and phenotypes, and dominant and recessive traits.
* We can complete a Punnett Square and determine the genotypic and phenotypic ratio.

**Learning Outcomes:*** We can predict the probability of dominant and recessive alleles transferred from each parent to offspring during sexual reproduction and represent the genotype in ratios.
* We can predict the probability of dominant and recessive alleles transferred from each parent to offspring during sexual reproduction and represent the phenotype in ratios.

**Activities:*** We can complete a Punnett Square to determine the genotypic and phenotypic ratio using dominant and recessive alleles.
 | Punnett Square Tutorial: <http://www.sumanasinc.com/webcontent/animations/content/mendel/mendel.swf> Punnett Square Animation: <http://bcs.whfreeman.com/webpub/biology/Bres1e/Animations/resources/0802_punnettsqexample.html> Interactive Punnett Square Virtual Lab:<http://www.glencoe.com/sites/common_assets/science/virtual_labs/E09/E09.html> Virtual Lab Punnett Square:<http://www.mhhe.com/biosci/genbio/virtual_labs/BL_05/BL_05.html> Multiple Punnett Square Games:<http://comelearnmore.com/websites-by-topic/genetics-games/>  | **CROSSCUTTING CONCEPT: Pattern***Students recognize, classify, and record patterns for macroscopic phenomena based on microscopic structure.***SCIENCE AND ENGINEERING PRINCIPLE:** **Analyzing and interpreting data***Students should create and analyze graphical presentations of data to identify linear and non-linear relationships, consider statistical features within data and evaluate multiple data sets for a single phenomenon* |
| Life Science 3: Heredity: Inheritance and Variation of Traits |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.LS3.1-** **Hypothesize that the impact of structural changes to genes (i.e., mutations) located on chromosomes may result in harmful, beneficial, or neutral effects to the structure and function of the organism.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can locate genes and chromosomes.
* We can explain how mutations occur.
* We can explain how mutations can be harmful, beneficial, or neutral to an organism.

**Learning Outcomes:*** We can hypothesize that structural changes to genes may result in harmful, beneficial, or neutral effects to the structure of an organism.
* We can hypothesize that structural changes to genes may result in harmful, beneficial, or neutral effects to the function of an organism.

**Activities:*** We can explain how mutations can be harmful, beneficial, or neutral to and organism and support our claim with evidence.
* We can research a genetic mutation to determine if it is harmful, beneficial, or neutral to the organism.
 | Amoeba Sisters Video: Mutations<http://bcs.whfreeman.com/webpub/biology/Bres1e/Animations/resources/0802_punnettsqexample.html> Amoeba Sisters Video Handout:<https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_mutations_v2_by_amoeba_sisters.pdf> Mutations Lab:[https://betterlesson.com/lesson/637426/exploring-mutations-lab#](https://betterlesson.com/lesson/637426/exploring-mutations-lab) Mutations Telephone Game:<https://www.teachengineering.org/activities/view/uoh_mutations_lesson01_activity1>  | **CROSSCUTTING CONCEPT: Structure and Function***Students begin to attribute atomic structure and interactions between**particles to the properties of a material.***SCIENCE AND ENGINEERING PRINCIPLE:** **Obtaining, evaluating, and communicating information***(Observe) Students can evaluate text, media, and visual displays of information with the intent of clarifying claims and reconciling explanations. Students can communicate scientific information in writing utilizing embedded tables, charts, figures, graphs.* |
| Engineering, Technology, and Applications of Science 2: Links Among Engineering Technology and Science on Society and the Natural World, |
| **Time Frame** | **Learning Outcomes/Activities** | **Online Resources** | **Crosscutting Concepts (CCC)****Science and Engineering Practices (SEP)** |
| **Standard: 7.ETS2.1-** **Examine a problem from the medical field pertaining to biomaterials and design a solution taking into consideration the criteria, constraints, and relevant scientific principles of the problem that may limit possible solutions.** |
| \_1\_ Weeks of Quarter\_\_\_% of TNReady | **Sub Objectives:** * We can identify a problem in the medical field that relates to biotechnology/bioengineering.
* We can design a solution to help people with human genetic disorders or mutations.

**Learning Outcomes:*** We can examine a problem from the medical field pertaining to biomaterials and design a solution that considers the criteria, constraints, and scientific principles that may limit possible solutions.

**Activities:*** We can design a solution to a problem in the medical field pertaining to biotechnology by creating a model/illustration that also identifies the criteria the solution will address and constraints of the solution.
 | Medical Innovations for Kids: <http://kidsahead.com/subjects/17-medical-innovations> Biomedical Technology for Kids: <http://encyclopedia.kids.net.au/page/me/Medical_technology> Information Bioengineering/Biomedical Engineer: <https://www.engineergirl.org/6066/BioengineeringBiomedical-Engineer> Medical Technology: <https://mashable.com/category/medical-technology/> Engineering Design Process for Kids: <https://www.eie.org/overview/engineering-design-process> Engineering for Kids:[https://engineering4kids.wikispaces.com/Engineering+Design+Process](https://engineering4kids.wikispaces.com/Engineering%2BDesign%2BProcess)  | **CROSSCUTTING CONCEPT: Scale, Proportion, and Quantity**  *Students recognize that phenomena are not necessarily observable at all scales.***SCIENCE AND ENGINEERING PRINCIPLE:** **Constructing explanations and designing solutions***Students can design as well as test devices meant to meet specific design criteria, with the objective of increasing the effectiveness of multiple solutions.* |