

7th Grade Science Standards

Website:

<https://www.google.com/url?q=https%3A%2F%2Fsites.google.com%2Fa%2Ftcsedu.net%2F7th-grade-science%2F&sa=D&sntz=1&usg=AFQjCNG5pO2oOnzrRogFS1NPApGDuECVrg>

1st quarter:

7.PS1.1: Develop and use models to illustrate the structure of atoms, including the subatomic particles with their relative positions and charges.

Key questions: What are atoms? What are the parts of an atom? What is the periodic table? How do electrons interact?

Explore: Research- Thomson's plum pudding model, Rutherford, Bohr

Materials: Website, handouts, textbook

Project: Create an atom

Vocabulary: atoms, protons, neutrons, electrons, ions, isotopes

7.PS1.2: Compare and contrast elemental molecules and compound molecules.

Key Questions: What is a monoatomic atom? What is a diatomic element? What is the difference between a diatomic molecule and a compound molecule?

Explore: Chemical makeup of common items in the home.

Materials: Website, handouts, textbook

Vocabulary: elements, compounds, molecules

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.

Key Questions: How is the periodic table arranged? What do all elements in a column have in common? How are the elements in the periodic table grouped? What are chemical and physical properties of an element?

Explore: Research an element

Materials: Website, handouts, textbook

Vocabulary:

7.PS1.3 Classify matter as pure substances or mixtures based on composition.

Key Questions: What makes a pure substance? What is a mixture?

Explore: Various labs

Materials: Website, handouts, textbook

Vocabulary: mixtures

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.

Key Questions: How do you count atoms in a compound? What is the law of conservation?

Explore: Balancing chemical equations

Materials: Website, handouts, textbook

Vocabulary: Reactants, products

7. PS1.6 Create and interpret models of substances whose atoms represent the states of matter with respect to temperature and pressure.

Key Questions: What are intermolecular attractions between atoms? How does temperature effect the state of matter?

Explore: Cornstarch lab

Materials: Website, handouts, textbook

Vocabulary: solids, liquids, gas, and their properties

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.

7.LS1.3 Evaluate evidence that cells have structural similarities and differences across kingdoms.

Key Questions: What are cells? What are the three parts to the cell theory? What is the difference between single celled organisms and multicellular organisms? How are plant and animal cells different? How are plant and animal cells similar?

Explore: Microscopes

Materials: Website, handouts, textbook

Project: Create an animal or plant cell.

Vocabulary: cell membrane, cell wall, nucleus, mitochondria, chloroplast, lysosomes, endoplasmic reticulum, ribosomes, DNA, RNA

7.LS1.2 Conduct an investigation to demonstrate how the cell membrane maintains homeostasis through the process of passive transport.

Key Questions: How does the cell membrane help to maintain homeostasis? What is the difference between passive transport and active transport? Explain diffusion and osmosis.

Explore: Egg Lab

Materials: Website, handouts, textbook

Vocabulary: homeostasis, passive transport, active transport, osmosis, diffusion

2nd quarter:

7.LS1.4 Diagram the hierarchical organization of multicellular organisms from cells to organism.

Key Questions: How are our bodies organized?

Explore: labs

Materials: Website, handouts, textbook

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).

Key Questions: What is the purpose of the following systems? *Digestive system, Respiratory system, Excretory system, Circulatory system, Nervous system, Integumentary system, Musculoskeletal system*

How do they work together?

Explore: labs

Materials: Website, handouts, textbook

Project: Create an interactive body system book

Vocabulary: varies for each system

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 survival and reproductive success.

Key Questions: Compare and contrast plant structures for reproductive success.

Explore: Migratory patterns of whales

Materials: Website, handouts, textbook

Vocabulary: Adaptation, asexual reproduction, sexual reproduction, regeneration, Budding, fission

7.LS1.7 Evaluate and communicate evidence that compares and contrasts the advantages and disadvantages of sexual and asexual reproduction.

Key Questions: How do some plants and animals reproduce asexually? What are the advantages? Disadvantages?

How do some plants and animals reproduce sexually? What are the advantages? Disadvantages?

Explore: Plant and animal kingdom

Materials: Website, handouts, textbook

Vocabulary see above

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.

Key Questions: What is mitosis and what is it used for? What does it create? How do cells go through mitosis?

Explore: How the body repairs itself.

Materials: Website, handouts, textbook

Vocabulary mitosis, interphase, prophase, metaphase, anaphase, telophase,

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.

Key Questions: Why does a plant need sunlight and water? How do organisms make energy?

Explore: labs

Materials: Website, handouts, textbook

Vocabulary cellular respiration, photosynthesis, chlorophyll, stomatas, aerobic, anaerobic,

3rd quarter:

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.

Key Questions: What is the carbon cycle?

Materials: Website, handouts, textbook

Project: Create a biome and explain how carbon moves throughout it's components.

Vocabulary: biotic, abiotic, ecosystem

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.

Key Questions: What is DNA and what does it do? How do genes code for traits?

Explore: Research genetic disorders

Materials: Website, handouts, textbook

Vocabulary: Mutations, genes, traits, alleles

7.LS3.2 Distinguish between mitosis and meiosis and compare the resulting daughter cells.

Key Questions: What is meiosis and what does it create?

Explore: Illustrate both cycles and record observations.

Materials: Website, handouts, textbook

Vocabulary: meiosis, gametes, zygote

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.

Key Questions: What is a Punnett square and what is it used for? How do you complete a Punnett square and what does it tell you? List three things a Punnett square can reveal.

Explore: Family traits, create a genetically correct organism

Materials: Website, handouts, textbook

Vocabulary: Genotype, phenotype, dominant, recessive, hybrids,

7.ESS3.1 Graphically represent the composition of the atmosphere as a mixture of gases and discuss the potential for atmospheric change.

Key Questions: What gases are in the atmosphere? Where do the gases come from? How can our atmosphere change?

Explore: create a time line of the history of our planet.

Materials: Website, handouts, textbook

Vocabulary

7.ESS3.2 Engage in a scientific argument through graphing and translating data regarding human activity and climate. COMPONENT IDEA: D. Global Climate Change

Key Questions: Is there a connection between human activity and climate change?

Explore: Research greenhouse effect, global climate change, melting icecaps.

Materials: Website, handouts, textbook

Vocabulary: global warming, greenhouse effect, acid rain,

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

Key questions: What are biomaterials? What problems can be solved in the medical field pertaining to surgically implanted devices?

Explore: medical devices

Projects: make an artificial hand

Materials: Website, handouts, textbook

Vocabulary: bioengineering, engineering design, biomaterials

4th quarter:

Review for TN ready Experimental design process

Explore: Design your own experiment.

Materials: Website, handouts, textbook