

Oakview Preparatory School

Long Range Plans

Teacher: *Karen Austin*

Curriculum: North American Division of SDA and New York State

Other Resources: videos, hands on interactive experiments, supplemental resource books

Assessments: quizzes, tests, research reports, projects, class participation, cooperative group work, classwork and homework

Grading Policy: homework **10%** classwork **20%** projects **20%** quizzes **5%** tests **40 %** Misc. **5%** late work will have a **5% deduction**

The students will master the following topics with 90% accuracy and score 85% or better on tests and given activities by the end of the stated time period.

adjustments may be made at the teacher's discretion

Science Grade: 8

Text: By Design Science Level 8
Explore God's Creation (*supplement*)

First Marking Period

September

Scientific Method

Lab safety procedures

Scientific method review

Project assignment

Objectives

NYSSLS Standard 1: Students will use scientific inquiry to pose questions, seek answers, and develop solutions.

NYSSLS Standard 4: Students will demonstrate the ability to design and carry out investigations using scientific processes.

NYSSLS Standard 6: Students will demonstrate understanding of the interrelationships among science, technology, and society.

Chapter 11

Ways matter changes

What are physical changes?

What are mixtures and solutions?

What are acids and bases?

Objectives

Key Idea 1: Matter is composed of atoms and molecules and can undergo physical and chemical changes.

1.1a: A physical change is a change in which the substance's physical properties are altered, but its chemical composition remains the same. Examples include changes in state (solid, liquid, gas), size, shape, or texture.

1.1b: Physical changes can be reversible (e.g., melting ice) or irreversible (e.g., breaking a glass).

1.1c: A mixture is a combination of two or more substances where each retains its own properties. Mixtures can be homogeneous (uniform composition, e.g., air) or heterogeneous (distinct, separate components, e.g., salad).

1.1d: A solution is a type of homogeneous mixture where one substance (the solute) is dissolved in another substance (the solvent). Solutions can be solid, liquid, or gaseous. Examples include saltwater and air.

1.1e: Acids are substances that release hydrogen ions (H^+) when dissolved in water and have a pH less than 7. Examples include hydrochloric acid and citric acid.

1.1f: Bases are substances that release hydroxide ions (OH^-) when dissolved in water and have a pH greater than 7. Examples include sodium hydroxide and ammonia.

1.1g: The pH scale is used to measure the acidity or basicity of a solution, ranging from 0 (most acidic) to 14 (most basic), with 7 being neutral (e.g., pure water).

Chapter 12

Solubility of liquids, Text p. 462 Cabbage Chemistry,

Elements of the periodic table

What are atoms?

How are elements organized?

What are metals?

What are nonmetals and metalloids?

What are radioactive elements?

Objectives

Key Idea 1: Atoms are the basic building blocks of matter.

1.1a: Atoms are the smallest units of elements that retain the properties of that element. They consist of a nucleus (containing protons and neutrons) and orbiting electrons.

1.1b: The arrangement and number of protons, neutrons, and electrons in an atom determine its chemical properties and its

Key Idea 1: The periodic table organizes elements based on their properties and atomic structure.

1.2a: Elements are organized in the periodic table by increasing atomic number and are grouped into periods (rows) and groups (columns) based on their similar properties and electron configurations.

1.2b: The periodic table is divided into different blocks, including s-block, p-block, d-block, and f-block, which reflect the filling of electron orbitals.

Key Idea 1: Metals have distinct properties and are a major category of elements on the periodic table.

1.3a: Metals are generally characterized by their conductivity, malleability, ductility, and luster. They tend to lose electrons during chemical reactions and form positive ions.

1.3b: Examples of metals include iron, gold, and aluminum. Metals are typically found on the left side and in the center of the periodic table.

Key Idea 1: Nonmetals and metalloids have properties distinct from metals and are classified accordingly.

1.4a: Nonmetals are elements that generally lack the properties of metals. They are often poor conductors of heat and electricity and tend to gain electrons in chemical reactions, forming negative ions. Examples include oxygen, carbon, and sulfur.

1.4b: Metalloids have properties intermediate between metals and nonmetals. They may exhibit both metallic and non-metallic characteristics and are found along the zig-zag line on the periodic table. Examples include silicon and boron.

Key Idea 1: Radioactive elements undergo radioactive decay and emit radiation.

1.5a: Radioactive elements are those that have unstable nuclei and emit radiation as they decay into more stable forms. This process can include alpha, beta, and gamma radiation.

1.5b: Examples of radioactive elements include uranium, radon, and plutonium. These elements are typically found in the f-block and some d-block of the periodic table and are used in various applications, including energy production and medical treatments.

October

Chapter 12 contd.

Solubility of liquids, Text p. 462 Cabbage Chemistry,

Elements of the periodic table contd.

What are atoms?

How are elements organized?

What are metals?

What are nonmetals and metalloids?

What are radioactive elements?

Objectives

Key Idea 1: Matter is composed of atoms and molecules and can undergo physical and chemical changes.

1.1a: Atoms are the basic building blocks of matter, consisting of a nucleus (containing protons and neutrons) surrounded by electrons.

1.1b: The properties of elements are determined by the arrangement and number of protons, neutrons, and electrons in their atoms.

Key Idea 1: The periodic table organizes elements based on their properties and atomic structure.

1.1c: The periodic table is organized into rows (periods) and columns (groups or families). Elements in the same group have similar chemical properties and the same number of valence electrons.

1.1d: The periodic table is arranged by increasing atomic number and categorizes elements into blocks based on their electron configurations, such as s-block, p-block, d-block, and f-block.

Key Idea 1: Elements have different properties based on their position in the periodic table.

1.1e: Metals are elements that are typically shiny, good conductors of heat and electricity, and malleable. They are found on the left and in the center of the periodic table. Examples include iron, gold, and copper.

1.1f: Nonmetals are elements that are generally not shiny, poor conductors of heat and electricity, and brittle in solid form. They are found on the right side of the periodic table. Examples include oxygen, nitrogen, and sulfur.

1.1g: Metalloids are elements that have properties intermediate between metals and nonmetals. They are found along the zigzag line on the periodic table. Examples include silicon, boron, and arsenic.

Key Idea 1: Some elements are unstable and undergo radioactive decay.

1.1h: Radioactive elements are those that have unstable nuclei and emit radiation as they decay to a more stable form. This process can include alpha particles, beta particles, or gamma rays.

1.1i: Examples of radioactive elements include uranium, radon, and plutonium. They are often used in nuclear energy and medical applications, but require careful handling due to their radiation.

Second Marking Period

November

Chapter 13

Types of chemical bonds

How do chemical bonds form?

How do covalent bonds form?

How are chemical formulas helpful?

Objectives

Key Idea 1: Matter is composed of atoms and molecules and can undergo physical and chemical changes.

1.1a: Atoms are the basic building blocks of matter, consisting of a nucleus (containing protons and neutrons) surrounded by electrons.

1.1b: The properties of elements are determined by the arrangement and number of protons, neutrons, and electrons in their atoms.

Key Idea 1: The periodic table organizes elements based on their properties and atomic structure.

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December

Chapter 4

How Animals Survive

What effects ecosystem dynamics?

What are animal adaptations?

What changes occur in ecosystems?

How do animals respond to environmental changes?

Objectives

Key Idea 1: Ecosystems are dynamic systems with interactions among living organisms and their environment.

1.1a: Ecosystem dynamics are influenced by various factors including climate, availability of resources, predation, competition, and human activities.

1.1b: Changes in any part of an ecosystem can affect the balance and interactions among species, which can lead to shifts in population sizes and community structure.

Key Idea 1: Animals have adaptations that help them survive and reproduce in their environments.

1.2a: Animal adaptations are specialized features or behaviors that enhance an animal's ability to survive in its specific environment. These adaptations can be structural (physical traits), behavioral (actions or activities), or physiological (internal processes).

1.2b: Examples of adaptations include camouflage for hiding from predators, specialized feeding structures, and migratory behaviors to find resources.

Key Idea 1: Ecosystems are subject to changes due to natural processes and human activities.

1.3a: Ecosystems can change due to natural processes such as succession (the gradual change in species composition over time) or disturbances (e.g., fires, floods).

1.3b: Human activities, such as deforestation, pollution, and climate change, can also lead to significant changes in ecosystems and their ability to support various species.

Key Idea 1: Animals respond to changes in their environment through various adaptive mechanisms.

1.4a: Animals may respond to environmental changes by altering their behavior (e.g., migration, hibernation), physiological processes (e.g., adjusting body temperature), or by evolving new adaptations over time.

1.4b: The ability of animals to adapt to environmental changes can affect their survival and reproduction, and some species may not be able to cope with rapid or extreme changes, leading to population declines or extinctions.

January

Chapter 4 contd.

Review for Midterms

February

Third Marking Period

Chapter 2

Types of Plants

How are plants classified?

What are spore Producing Plants?

What Are Gymnosperms?

What are Angiosperms?

Objectives

Key Idea 1: Plants are classified based on their structures, reproduction methods, and life cycles.

1.1a: Plants are classified into various groups based on characteristics such as their reproductive structures, types of vascular tissues, and whether they produce seeds or spores.

1.1b: The main groups of plants include nonvascular plants, seedless vascular plants, gymnosperms, and angiosperms.

Key Idea 1: Some plants reproduce by producing spores instead of seeds.

1.2a: Spore-producing plants, also known as non-seed plants, reproduce by releasing spores, which can develop into new individuals without the need for seeds.

1.2b: Examples of spore-producing plants include ferns, mosses, and liverworts. These plants typically have structures such as sori (clusters of spores) or sporangia (spore-producing organs).

Key Idea 1: Gymnosperms are seed-producing plants that do not produce flowers or fruits.

1.3a: Gymnosperms are a group of plants that produce seeds that are not enclosed in a fruit. Their seeds are often found in cones or other structures.

1.3b: Examples of gymnosperms include conifers (such as pine trees), cycads, ginkgoes, and gnetophytes.

Key Idea 1: Angiosperms are flowering plants that produce seeds enclosed in fruits.

1.4a: Angiosperms are characterized by their production of flowers and seeds enclosed within fruits. They are the largest group of plants and include a wide variety of species.

1.4b: Angiosperms are divided into two main groups: monocots (plants with one cotyledon, such as grasses and lilies) and dicots (plants with two cotyledons, such as roses and sunflowers).

March

Chapter 3

How Plants Survive

How do plants capture energy?

What are plant adaptations?

How do humans effect the survival of plants?

Objectives

Key Idea 1: Plants capture and use energy to grow and reproduce through photosynthesis.

1.1a: Plants capture energy from sunlight through a process called photosynthesis, which occurs in the chloroplasts of plant cells. During this process, plants convert sunlight, carbon dioxide, and water into glucose and oxygen.

1.1b: Photosynthesis is crucial for plant growth and development, as it provides the energy and organic compounds needed for the plant's functions and reproduction.

Key Idea 1: Plants have adaptations that help them survive in various environments.

1.2a: Plant adaptations are specialized features or behaviors that enhance a plant's ability to survive and reproduce in its specific environment. These adaptations can be structural (physical traits), physiological (internal processes), or behavioral (growth patterns).

1.2b: Examples of plant adaptations include xerophyte adaptations (such as thick cuticles and deep roots in cacti), adaptations for water conservation (e.g., needle-like leaves in pine trees), and adaptations for reproduction (e.g., colorful flowers to attract pollinators).

Key Idea 1: Human activities can impact plant survival and ecosystems.

1.3a: Human activities such as deforestation, urbanization, pollution, and agriculture can have significant effects on plant survival and ecosystems. These activities can lead to habitat loss, changes in soil quality, and alterations in water availability.

1.3b: Efforts to mitigate negative impacts on plants include conservation practices, sustainable agriculture, and restoration projects aimed at preserving natural habitats and biodiversity.

Fourth Maring period

April

Chapter 9

Resources and their uses

How can we use resources wisely?

How have people affected earth's water resources?

How have people affected earth's atmosphere

Objectives

Key Idea 1: Efficient and sustainable use of resources is important for environmental conservation.

1.1a: Resources, including natural resources like water, minerals, and energy, should be used in ways that minimize waste and environmental impact. This includes practices such as recycling, reducing consumption, and conserving resources.

1.1b: Sustainable resource management involves making decisions that ensure resources are available for future generations while maintaining ecological balance.

Key Idea 1: Human activities can significantly impact water resources and quality.

1.2a: Activities such as industrial discharge, agriculture runoff, and urban development can lead to pollution and contamination of water resources, affecting both freshwater and marine environments.

1.2b: Overuse and mismanagement of water resources can lead to issues such as depletion of aquifers, reduced availability of clean water, adverse effects on aquatic ecosystems.

Key Idea 1: Human activities can influence the composition and quality of the atmosphere.

1.3a: Emissions from vehicles, industries, and power plants contribute to air pollution, which can lead to problems such as smog, acid rain, and respiratory issues in humans.

1.3b: Greenhouse gases, such as carbon dioxide and methane, released by human activities contribute to climate change by trapping heat in the atmosphere, leading to global warming and related environmental impacts.

May Chapter 6

Your Lifestyle Effects Your Body

How do drugs affect your body?

How do alcohol and tobacco affect your body?

A plan for your body

Objectives

Key Idea 1: Drugs can have various effects on the body and mind, depending on their type and use.

1.1a: Drugs can alter the body's normal functioning by interacting with the nervous system and other physiological processes. They can have both short-term and long-term effects on health.

1.1b: The effects of drugs can vary based on factors such as dosage, method of use, and individual health conditions. Misuse or abuse of drugs can lead to serious health issues, including addiction, physical and mental health problems.

Key Idea 1: Alcohol and tobacco use can have significant negative impacts on health.

1.2a: Alcohol consumption can impair judgment, coordination, and reaction time, and can lead to long-term health issues such as liver disease, heart problems, and addiction.

1.2b: Tobacco use is associated with a range of serious health problems, including respiratory issues, cardiovascular disease, and cancer. Both smoking and smokeless tobacco products can have harmful effects on the body.

Key Idea 1: Developing a healthy lifestyle plan can contribute to overall well-being.

1.3a: A healthy lifestyle plan includes balanced nutrition, regular physical activity, adequate rest, and avoiding harmful substances. Making informed choices can help maintain and improve health.

1.3b: Educating oneself about the effects of lifestyle choices and making proactive decisions to support physical and mental health is important for long-term well-being.

June Review for finals

Final Exams