

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: 7

Text: By Design Level 7, Explore God's World,

First Marking Period

September

Gummy DNA, cell membrane p 146 BFEK

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 1

Bacteria, Protists and Fungi

What are Bacteria?

What are Protists?

What are Fungi?

MAP Tests of Basic Skills

Objectives

1.1c: Bacteria are single-celled microorganisms that lack a nucleus and other organelles. They are classified as prokaryotes.

1.1d: Bacteria can be found in a variety of environments and play essential roles in processes such as decomposition, nitrogen fixation, and digestion.

1.1e: Protists are a diverse group of mostly single-celled organisms that have a nucleus and other organelles. They are classified as eukaryotes.

1.1f: Protists can be autotrophic (producing their own food through photosynthesis) or heterotrophic (obtaining food from other organisms), and they can be found in various environments, particularly in water.

1.1g: Fungi are a group of organisms that include yeasts, molds, and mushrooms. They are eukaryotic, meaning they have a nucleus, and they obtain nutrients by decomposing organic matter.

1.1h: Fungi play a critical role in ecosystems as decomposers, breaking down dead organisms and recycling nutrients back into the environment.

October

Chapter 2

Characteristics of invertebrates

How are invertebrates classified?

What are Sponges, Cnidarians and Worms?

What are Mollusks and Echinoderms?

What are Arthropods?

How do invertebrates use their senses?

Objectives

Key Idea 1: Living things are both similar to and different from each other and from nonliving things.

1.1a: Invertebrates are animals without a backbone. They exhibit a wide range of body structures and adaptations that enable them to survive in diverse environments.

1.1b: Invertebrates are classified into various groups based on their body structure, symmetry, and other characteristics. Major groups include sponges, cnidarians, worms, mollusks, echinoderms, and arthropods.

1.1c: Sponges are simple invertebrates with porous bodies and a lack of true tissues and organs.

1.1d: Cnidarians, such as jellyfish and corals, have a simple body structure with radial symmetry and specialized cells called cnidocytes for capturing prey.

1.1e: Worms, including flatworms, roundworms, and segmented worms, have more complex body structures with bilateral symmetry and a variety of adaptations for movement and feeding.

1.1f: Mollusks, such as snails, clams, and octopuses, have a soft body and, in many cases, a hard shell. They have a body plan that includes a head, a muscular foot, and a mantle.

1.1g: Echinoderms, such as starfish and sea urchins, have radial symmetry and a water vascular system used for movement and feeding. They have a hard, calcareous exoskeleton.

1.1h: Arthropods, including insects, spiders, and crustaceans, are characterized by their segmented bodies, exoskeletons, and jointed appendages. They are the largest and most diverse group of invertebrates.

1.1i: Invertebrates have various sensory structures adapted to their environments, including simple eyes, antennae, and specialized cells that detect light, sound, chemicals, and touch. These adaptations help them find food, avoid predators, and communicate with others.

Second Marking Period

November

Chapter 3 Characteristics of Vertebrates

What are Fish?

What are Amphibians and Reptiles?

What are Birds and Mammals?

How do vertebrates behave and communicate?

Objectives

Key Idea 1: Living things are both similar to and different from each other and from nonliving things.

1.1a: Vertebrates are animals with a backbone or spinal column. They belong to the subphylum Vertebrata within the phylum Chordata.

1.1b: Vertebrates have an internal skeleton, a brain encased in a skull, and a well-developed nervous system.

1.1c: Fish are aquatic vertebrates with gills for respiration, scales covering their bodies, and fins for movement.

1.1d: Fish are classified into three main groups: jawless fish (e.g., lampreys), cartilaginous fish (e.g., sharks and rays), and bony fish (e.g., salmon and trout).

1.1e: Amphibians are vertebrates that live part of their lives in water and part on land. They have moist skin and undergo metamorphosis (e.g., frogs and salamanders).

1.1f: Reptiles are vertebrates with dry, scaly skin and lay eggs on land. They are adapted to life on land and include snakes, lizards, turtles, and crocodiles.

1.1g: Birds are warm-blooded vertebrates with feathers, beaks, and hollow bones. They lay hard-shelled eggs and have adapted to flight (e.g., eagles and sparrows).

1.1h: Mammals are vertebrates with hair or fur and mammary glands that produce milk to feed their young. They are warm-blooded and include various species such as humans, dogs, and whales.

1.1i: Vertebrates use a range of behaviors and communication methods to interact with their environment and other organisms. These methods include vocalizations, visual signals, body language, and chemical signals.

1.1j: Vertebrate behaviors can be instinctive or learned, and they play crucial roles in finding food, mating, avoiding predators, and establishing social structures.

December **Lab:** air pressure w/ soda p.128 ESFEK, heads/tails BFEK p.118

Chapter 6

Infectious Disease

How does the immune system protect the body?

What are infectious diseases?

How are STD's prevented?

How does the world combat disease

Objectives

Key Idea 1: Living things are both similar to and different from each other and from nonliving things.

Major Understanding 1.1a: The immune system is a complex network of cells, tissues, and organs that work together to defend the body against pathogens (e.g., bacteria, viruses, fungi, and parasites).

Major Understanding 1.1b: The immune system includes components such as white blood cells, antibodies, and lymph nodes, which recognize and respond to foreign invaders, helping to prevent infections and diseases.

Major Understanding 1.1c: Infectious diseases are caused by pathogens that enter the body and multiply, potentially leading to illness. Common types of pathogens include bacteria, viruses, fungi, and parasites.

Major Understanding 1.1d: Infectious diseases can be transmitted from person to person through various means, including direct contact, contaminated food or water, and airborne particles.

Major Understanding 1.1e: Sexually transmitted diseases (STDs) are infections transmitted through sexual contact. Preventive measures include practicing safe sex, using condoms, and undergoing regular testing for STDs.

Major Understanding 1.1f: Education and awareness about STDs and their prevention are crucial for reducing the spread and impact of these diseases.

Major Understanding 1.1g: The world combats disease through various strategies, including vaccination programs, public health initiatives, and sanitation improvements.

Major Understanding 1.1h: International organizations, such as the World Health Organization (WHO), and national health agencies work to monitor, prevent, and respond to disease outbreaks and pandemics.

January

Chapter 6 contd.

Review for Midterms

Third Marking Period

February

How Organisms Inherit Traits ch 4

How are DNA, Genes and Cell Division Connected?

What is simple inheritance?

What is genetic engineering?

Objectives

Key Idea 1: Living things are both similar to and different from each other and from nonliving things.

Major Understanding 1.1a: DNA (deoxyribonucleic acid) is the molecule that carries genetic information in cells. It consists of two strands that form a double helix.

Major Understanding 1.1b: Genes are segments of DNA that contain instructions for building proteins and determine specific traits in an organism. They are the basic units of heredity.

Major Understanding 1.1c: Cell division, including mitosis and meiosis, is the process by which cells replicate and divide. Mitosis produces identical cells for growth and repair, while meiosis produces sex cells (gametes) for reproduction.

Major Understanding 1.1d: Simple inheritance, or Mendelian inheritance, involves the transmission of traits from parents to offspring through dominant and recessive alleles.

Major Understanding 1.1e: Traits are controlled by pairs of alleles, one inherited from each parent. Dominant alleles mask the expression of recessive alleles, affecting the phenotype of the organism.

Major Understanding 1.1f: Genetic engineering involves manipulating an organism's DNA to alter its traits or produce new traits. This can be done through techniques such as gene cloning, gene therapy, and recombinant DNA technology.

Major Understanding 1.1g: Genetic engineering has applications in medicine, agriculture, and research, but it also raises ethical and safety considerations regarding its use and impact on living organisms and ecosystems.

March

Chapter 5

Human Development and Sexuality

How do organisms reproduce?

What are the challenges of sexual maturity?

Why is sexual abstinence important?

Objectives

Key Idea 1: Living things are both similar to and different from each other and from nonliving things.

1.1a: Reproduction is the process by which organisms produce offspring to ensure the continuation of their species. There are two main types of reproduction: asexual and sexual.

1.1b: In sexual reproduction, male and female reproductive cells (gametes) combine to form a zygote, which develops into a new organism. In asexual reproduction, a single organism produces offspring without the involvement of gametes.

1.1c: Sexual maturity is the stage at which an organism becomes capable of reproduction. In humans, this period is known as puberty and involves physical, emotional, and hormonal changes.

1.1d: Challenges associated with sexual maturity include dealing with physical changes, managing emotions, understanding relationships, and making informed decisions about sexual health.

1.1e: Sexual abstinence, or refraining from sexual activity, can be important for various reasons, including avoiding sexually transmitted diseases (STDs), preventing unintended pregnancies, and making informed decisions about sexual health and relationships.

1.1f: Abstinence is one of several strategies for managing sexual health and is often emphasized in education as part of a comprehensive approach to understanding human sexuality and health.

April

Chapter

What are the planets in our solar system?

What other objects are in our solar system?

Why do we study space?

Objectives

Key Idea 1: The universe is a vast and dynamic system that is constantly changing.

1.1a: The solar system consists of the Sun and the objects that orbit it, including eight planets, their moons, dwarf planets, and other celestial bodies.

1.1b: The eight planets in our solar system are, in order from the Sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Each planet has distinct characteristics, such as size, composition, and atmosphere.

1.1c: In addition to planets, the solar system contains other objects such as asteroids, comets, meteoroids, and dwarf planets (e.g., Pluto).

1.1d: Asteroids are rocky objects that mainly orbit the Sun between Mars and Jupiter. Comets are icy bodies that have highly elliptical orbits and develop tails when they approach the Sun. Meteoroids are smaller objects that can become meteors or meteorites if they enter Earth's atmosphere and land on its surface.

1.1e: Studying space helps us understand the origins and evolution of the universe, the formation of celestial bodies, and the potential for life beyond Earth.

1.1f: Space exploration leads to advancements in technology and knowledge that can benefit other areas of science and society. It also helps us learn more about Earth's environment and how to protect it.

Fourth Marking Period

May

Chapter 13

Work, Power and Machines

How are work and power related?

What are inclined planes, wedges, and screws?

What are levers, wheels, and axles and pulleys?

Chapter 14

Energy Transferred and Transformed

What are the forms of energy?

How is energy transformed?

What is thermal energy?

How is thermal energy transferred?

Objectives

Key Idea 1: The interactions of matter and energy are fundamental to understanding how the universe operates.

1.1a: Work is done when a force causes an object to move in the direction of the force. It is calculated as the product of force and distance ($\text{Work} = \text{Force} \times \text{Distance}$).

1.1b: Power is the rate at which work is done or energy is transferred over time. It is calculated as work divided by time ($\text{Power} = \text{Work} / \text{Time}$). Power measures how quickly work is done or energy is used.

Key Idea 1: Machines make work easier by changing the magnitude or direction of the force applied.

1.1c: An inclined plane is a flat surface set at an angle to help lift objects with less force. Examples include ramps and slides.

1.1d: A wedge is a tool that converts a force applied to its blunt end into a splitting force. Examples include knives and chisels.

1.1e: A screw is an inclined plane wrapped around a cylinder. It converts rotational force into linear motion. Examples include screws and bolts.

1.1f: A lever is a rigid bar that pivots around a fixed point called a fulcrum. It is used to amplify force or change direction. Examples include seesaws and crowbars.

1.1g: A wheel and axle is a simple machine consisting of a large wheel attached to a smaller axle. It helps to reduce friction and make it easier to move or lift objects. Examples include doorknobs and bicycles.

1.1h: A pulley is a wheel with a groove around its edge that holds a rope or cable. It is used to change the direction of a force and can also be used to lift heavy objects. Examples include flagpoles and cranes.

Key Idea 1: Energy exists in different forms and can be transferred or transformed from one form to another.

1.1i: Energy can exist in several forms, including kinetic energy (energy of motion), potential energy (stored energy), thermal energy (heat), chemical energy (stored in bonds), electrical energy, and radiant energy (light).

1.1j: Energy transformation is the process of changing energy from one form to another. For example, electrical energy can be transformed into light energy in a light bulb or into kinetic energy in a fan.

1.1k: Thermal energy, or heat energy, is the energy that comes from the movement of atoms and molecules in a substance. It is related to the temperature of the substance and the total kinetic energy of its particles.

1.1l: Thermal energy is transferred through conduction (direct contact), convection (movement of fluids), and radiation (electromagnetic waves). Each method involves different processes for transferring heat between objects or substances.

June

Final Exam Review