

Grade 7

Heredity and Evolution I

Initial Understanding

- Demonstrate that Evolution is one theory on the origin of life on Earth
- Describe the four stages of Charles Darwin's theory of evolution by natural selection
- Recall the parts of the cell theory
- Describe the structure and function of cellular organelles
- Identify similarities and differences that characterized different types of cells (i.e. plant, animal, muscle, nerve, bone, etc.)
- Give examples for each level of organization beginning at the micro level
- Identify the five major organic compounds
- List the types of transport: passive transport and active transport

Develop an Interpretation

- Compare evidence for each step of natural selection
- Explain the difference between animal and plant cells
- Describe each organic compound as it relates to its chemical structure
- Illustrate the major differences between active and passive transport

Making Connections

- Use comparative anatomy as evidence of natural selection
- Respond to why there are some additional organelles in plant cells when compared to animal cells
- Analyze food labels for organic compound content

Critical Stance

- Defend the theory of evolution based on scientific evidence
- Check the nutritional value for a given food label

Heredity and Evolution II

Initial Understanding

- Describe the basic structure of the DNA molecule and RNA
- Describe a gene
- Describe a trait
- Describe how DNA replicates
- Demonstrate a Punnett Square

Develop an Interpretation

- Create a model of the DNA molecule and the RNA molecule

Create a Punnett Square for a monohybrid cross and a dihybrid cross
Explain the process of DNA replication
Explain the relationship between DNA, RNA, a gene, a trait, and the Punnett square

Making Connections

Discuss the correlation between ethnicity and genetic predispositions. i.e.
Blond hair, blue eyes, curly hair, and straight hair
Discuss genetically inherited sickness such as Tay Sachs, Muscular Dystrophy, sickle cell anemia, etc.

Structure and Function I

Initial Understanding

List the characteristics and the basic needs of all living things
Describe a prokaryotic cell and a eukaryotic cell
Describe why viruses are similar to and different from living things
List the four major types of viruses
Define mitosis and meiosis

Develop an Interpretation

Classify objects as either living or nonliving
Draw and label a prokaryotic cell and a eukaryotic cell
Construct a visual to describe major differences in the six kingdoms (concept map, diagram)
Draw and label the four major types of viruses
Draw, label, and describe each stage of mitosis
Draw, label, and describe each stage of meiosis

Making Connections

Discuss the characteristics of a living organisms focusing in on their survival needs
Design a cell model
Discuss the stages of mitosis and meiosis
Design your own classification system based on Linnaeus'

Critical Stance

Articulate the reasons doctors do not give antibiotics for a viral infection
Judge whether or not a designated creation is living
Given an example of an unknown cell, evaluate whether the cell is eukaryotic or prokaryotic, virus or prion and defend your stand
Recognize and judge the impact of viruses, prions, and bacteria in our world
Defend and or refute the statement: Viruses are Living

Structure and Function II

The Reproductive System

Initial Understanding

Describe the characteristics and functions of the male and female reproductive system

Recall that in human's sexual reproduction and internal fertilization occurs

Identify irregularities and disorders of the human reproductive system

Recall the menstrual cycle

Recall the stages of human development from fertilization to birth

Recall the stages of human development from birth to death

Develop an Interpretation

Explain an irregularity or disorder in the human reproductive system

Given a description of a human stage, predict at what time frame in the human's life it would occur

Compare the male and female reproductive systems

Making Connections

Design a model of the stages of human development

Critical Stance

Defend the need for genetic counseling

The Skeletal System

Initial Understanding

Describe the function of the skeletal system

Label major bones of the skeletal system

Describe the internal structure of bones

Describe the major joint types

Describe the major types of connective tissue

Develop an Interpretation

Compare the relationship between the structure and function of bones

Describe the internal structure of bones

Give an example of connective tissue

Making Connections

Describe the importance of a healthy skeletal system while playing sports

Critical Stance

Justify the need to maintain a healthy skeletal system

The Muscular System

Initial Understanding

Describe the functions of the muscular system

Label the major types of muscular tissue

Recall the major types of connective tissue

Develop an Interpretation

Predict a given major muscles types as voluntary or involuntary

Compare and contrast the major muscle types

Explain how skeletal muscle move bones

Making Connections

Discuss the advantages and disadvantages of aerobic exercise and resistance exercise

Critical Stance

Take a stance on the use of nutritional supplements and their effects on the muscular system

Enumerate the dangers of anabolic steroids

The Integumentary System

Initial Understanding

Describe the major parts and functions of the integumentary system

List the major parts of the skin

Develop an Interpretation

Explain skin color as it relates to melanin

Compare the structure of the two major layers of the skin

Making Connections

Discuss the importance of proper skin care in general health

Guess why you feel pain when you pull on your hair or nails but not when you cut them

Critical Stance

Advocate for the use of sun block

Make a judgment on the use of tanning beds

The Nervous System

Initial Understanding

- Name the parts of the nervous system and describe their functions
- Name the two subdivisions of the nervous system
- Describe the structure of the neuron
- Describe a nerve impulse
- Describe the three parts of the brain along with their function
- Describe the importance of the major components of the spinal cord

Develop an Interpretation

- Compare the central nervous system with the peripheral nervous system
- Explain how neurons in the nervous system work together
- Explain the major components of a reflex

Making Connections

- Discuss the five senses and how they relate to the nervous system
- Model an involuntary response (i.e. pain in the toe, touching something hot, and knee jerk)

Critical Stance

- Advocate for the use of protective head and body gear used during sporting activities

The Immune System

Initial Understanding

- Describe the meaning of disease and pathogen
- Name some common human pathogens
- Define the meaning of antigen and antibody

Develop an Interpretation

- Compare and contrast infectious and noninfectious diseases
- Develop a concept map showing all major types and functions of immune system cells

Making Connections

- Discuss methods to protect yourself from pathogens
- Discuss the immune response path to a given infectious disease

Critical Stance

- Support why there is no known cure for immune system diseases that are caused by viruses
- Evaluate the role a vaccine plays in fighting disease

The Endocrine System

Initial Understanding

- Define what an endocrine gland is
- Describe the function of the endocrine system
- Name the major glands of the endocrine system
- Define feedback control mechanism

Develop an Interpretation

- Compare the functions of the major endocrine system glands
- Explain how the flight/fight response in the endocrine system works

Making a Connection

- Construct a diagram or a concept map explaining how this feedback control mechanism works to start and stop an action
- Discuss the connection between the endocrine system and homeostasis
- Discuss how a disease is related to a dysfunction in the Endocrine System

Critical Stance

- Defend why the fight/flight response in the endocrine system exists

The Urinary System

Initial Understanding

- Describe the functions of the urinary system
- Name the major organs of the urinary system
- Describe the major components of the kidney
- Describe the excretory role of the kidney

Develop an Interpretation

- Explain how the kidney filters the blood
- Explain some disorders of the urinary system

Making Connections

- Discuss the similarities of a water filtering system in a swimming pool and the kidneys filtering system
- Discuss the role of a diuretic

Critical Stance

- Rank the use of sports drinks vs. water during exercise

The Circulatory System

Initial Understanding

- Describe the function of the cardiovascular system

Name the major organs of the cardiovascular system (i.e. heart, arteries, veins, capillaries and blood)

Name the major components of blood (i.e. red blood cells, white blood cells, platelets, and plasma)

Name the major blood types

Name the parts of the heart

Describe the major components of the lymphatic system

Describe the path blood travels as it circulates through the body

Develop an Interpretation

Compare blood types

Describe the role of the organs of the lymphatic system

Making Connections

Design and label a model of a heart on a diagram

Discuss the lymphatic system being considered a part of the circulatory system

Design an illustration for the three types of blood vessels (arteries, veins, capillaries)

Discuss the relationship between blood vessels and blood pressure

Discuss the relationship between the lymph and blood

Critical Stance

Articulate what you need to maintain a healthy cardiovascular system

Judge the role of the lymphatic system as part of the immune system

The Respiratory System

Initial Understanding

Describe the structure and function of the organs of the respiratory system

Label the parts of the lung on a diagram or model

Demonstrate the process of breathing and respiration

Describe how the respiratory system excretes waste products

Develop an Interpretation

Explain how why the lung is classified as an excretory organ

Compare cellular respiration and respiration

Making Connections

Design a model of the flow of air through the respiratory system

Discuss the relationship between lung capacity and breathing rate

Summarize how the lungs, the kidneys, and the blood work together

Critical Stance

Advocate for a smoke free environment

Judge the environmental factors that play a role in the increase of asthma

The Digestive System

Initial Understanding

Describe the structure and functions of the digestive system

Describe the process of mechanical digestion

Describe the process of chemical digestion

Describe how enzymes and organ secretions aid in digestion

Define absorption

Develop an Interpretation

Compare mechanical and chemical digestion

Explain how absorption relates to the intestines, liver, and pancreas

Explain the process of chemical digestion of carbohydrates, proteins, and fats and discuss where these are digested i.e. mouth, stomach, or intestines

Making Connections

Illustrate or construct a model of the major components of the digestive system

Model the path traveled by a mouthful of food through the digestive system

Critical Stance

Debate about food advertising during children's television viewing hours

Judge the impact of eating disorders on the digestive system