

Grade Six

Matter and Energy in Ecosystems I

Initial Understanding

- Define abiotic and biotic
- Define producers, consumers and decomposers
- Define food chains and food web
- Define community, population, habitat, ecosystems, and niches

Develop an Interpretation

- Identify abiotic and biotic factors in the environment
- Explain each level of the environmental organizational chart
- Compare the flow of energy through an ecosystem
- Define the major characteristics that define the various biomes

Making Connections

- Describe how producers, consumers (herbivores, carnivores, and scavengers), and decomposers are linked in a food web
- Describe the relationships between organisms' adaptations and their particular biome
- Construct a food chain and a food web

Critical Stance

- Defend how the elimination of one organism could affect the food chain/web

Matter and Energy in Ecosystems II

Initial Understanding

- Define the term "Plant" and list the plant parts
- Define the process of photosynthesis

Developing and Interpretation

- Illustrate the parts of a plant cell
- Construct a model of a flowering plant
- Illustrate the life cycle of a flowering plant
- Explain the role of photosynthesis as it relates to the oxygen and carbon dioxide cycle

Making Connections

- Explain the symbiotic relationship between insects and flowering plants

Critical Stance

- Defend the need to protect and conserve groundwater.
- Defend the need to protect and conserve tropical rainforests and other unique biomes.

Energy Transfer and Transformations

Initial Understanding

- Define 'matter' and then list the states of matter
- Define and label the parts of an atom
- Define the term 'element'
- Define the Periodic Table

Develop an Interpretation

- Illustrate the states of matter
- Construct a model of an atom

Making Connections

- Illustrate the use of common elements from the Periodic Table in everyday life

Critical Stance

- Advocate for or against the use of renewable energy

Properties of Matter

Initial Understanding

- Describe the properties of an atom.
- Describe the properties of common elements such as oxygen, hydrogen, carbon, iron and aluminum.
- Describe how the properties of simple compounds, such as water and table salt, are different from the properties of the elements of which they are made.

Develop an Interpretation

- Explain how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility and boiling point.

Making Connections

- Design a model of an atom
- Design a model of a molecule
- Discuss the difference between a molecule and an atom

Critical Stance

Evaluate how the structure of matter affects the properties and uses of materials of a Styrofoam cup.

Forces and Motion I

Initial Understanding

Define force, distance, and work

Demonstrate how simple machines such as inclined planes, pulleys and levers are used to create mechanical advantage.

Define potential energy

Define kinetic energy

Develop an Interpretation

Explain the relationship between force, distance and work, and use the relationship ($W = F \times D$) to calculate work done in lifting heavy objects.

Compare how different types of stored (potential) energy can be used to make objects move.

Making Connections

Design simple machines such as inclined planes, pulleys and levers

Design a roller coaster to demonstrate potential and kinetic energy

Critical Stance

Judge the best design for a ramp for handicap access.

Forces and Motion II

Initial Understanding

Define average speed

Define force

Define mass

Define inertia

Define Newton's 3 laws of motion

Develop an Interpretation

Compare mass and weight

Compare distance over time as it applies to rate

Predict, based on Newton's laws, the outcome of a

Making Connections

Design a catapult to show Newton's laws of motion

Discuss the amount of force needed for a car, a human, and a cheetah to move one mile.

Discuss inertia as it applies to a moving car as hitting a stationary wall.

Critical Stance

Advocate for or against the mandatory use of seatbelts in cars.