

-Science-
(4th Grade)

Physical Science – Force and Motion

What makes objects move the way they do?

- **Recognize that the position and motion of objects can be changed by pushing or pulling**

Initial Understanding

Understand the relationship between push and pull on an object

Observe that the size of the change in an object's motion is related to the strength of the push or pull

Developing an Interpretation

Explain that the more massive an object is, the less effect a given force will have on its motion

Making Connections

Illustrate the effect of the mass on an object on its motion

Critical Stance

Demonstrate the ramification of push and pull on objects in space

Life Science – Matter and Energy in Ecosystems

How do matter and energy flow through ecosystems?

- **All organisms depend on the living and non-living features of the environment for survival**

Initial Understanding

Understand that when the environment changes, some organisms survive and reproduce, while others die (become extinct) or move to new locations (emigrate)

Developing an Interpretation

Use the terms biotic and abiotic, emigration and immigration as it pertains to ecosystems

Describe the interdependence that exists between plants and animals

Making Connections

Create and use simulation models of an ecosystem whose parameters are biotic, abiotic, emigration and immigration

Identify how animals, directly, or indirectly, depend on plants to provide the food and energy they need in order to grow and survive

Critical Stance

Demonstrate with words and/or pictures that show how natural phenomena and some human activities may cause changes to habitats and their inhabitants

Earth Science – Energy's in the Earth's systems

How do external and internal sources of energy affect the Earth's systems?

- **Water has a major role in shaping the Earth's surface**

Initial Understanding

Identify and understand the water cycle

Understand that water is an integral force on Earth

Developing an Interpretation

Explain that water circulates through the Earth's crust, oceans and atmosphere

Explain how the sun's energy impacts the water cycle

Making Connections

Examine the role of water in erosion and river formation

Critical Stance

Explain that water in various forms and amounts plus the interaction of the underlying bedrock determine the type and kind of erosion that results

Explore alternative water interactions

Energy Transfer and Transformation

What is the role of energy in our world?

- **Electrical and magnetic energy can be transferred and transformed**

Initial Understanding

Give examples of electrical circuits

Define the properties of magnetism

Developing an Interpretation

Describe how batteries and wires can transfer energy to light a light bulb

Explain how magnets can make objects move

Making Connections

Explain how simple electrical circuits can be used to determine which materials conduct electricity

Describe how electricity in circuits can be transformed into light, heat, sound and magnetic effects

Understand how magnets can make objects move without direct contact between the object and the magnet

Critical Stance

Explore the properties of electrical circuits that produce light, heat, sound and magnetic effects

Explain the properties of magnets, and how they can be used to identify and separate mixtures of solid materials