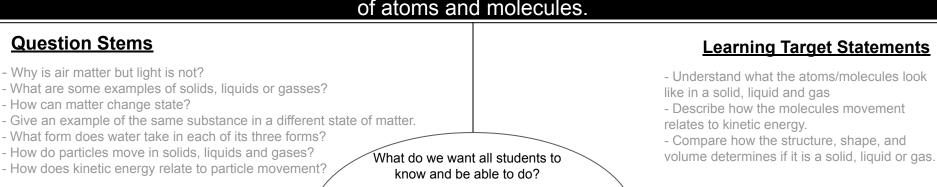
(6.6A) Compare solids, liquids, and gases in terms of structure, shape, volume, and kinetic energy of atoms and molecules.



- Compare solids liquids and gasses

based on their properties

Specific Skills

- Identify states of matter using particle diagrams.
- Students should be given multiple opportunities to differentiate between solids. liquids, and gasses based on structure, kinetic energy, mass, and volume.

Academic Vocabulary

- liquid → state of matter with definite volume but not a definite shape

- solid → state of matter with definite shape and volume

- gas → state of matter with definite volume or shape
- kinetic energy → moving particles
- atom → smallest building blocks of matter
- **molecule** → two or more atoms chemically combined
- volume → the amount of space matter takes up - mass → takes up space and has volume

(6.6B) Investigate the properties of matter to distinguish between pure substances, homogeneous mixtures (solutions), and heterogeneous mixtures.

Question Stems

- What is a homogeneous and heterogeneous mixture?
- What is a pure substance?
- How can you tell the difference between the two types of mixtures?
- How can you tell the difference between a pure substance and a homogeneous mixture?

What do we want all students to know and be able to do?

- Distinguish between pure substances, and both types of mixtures — homogeneous and heterogeneous

<u>Learning Target Statements</u>

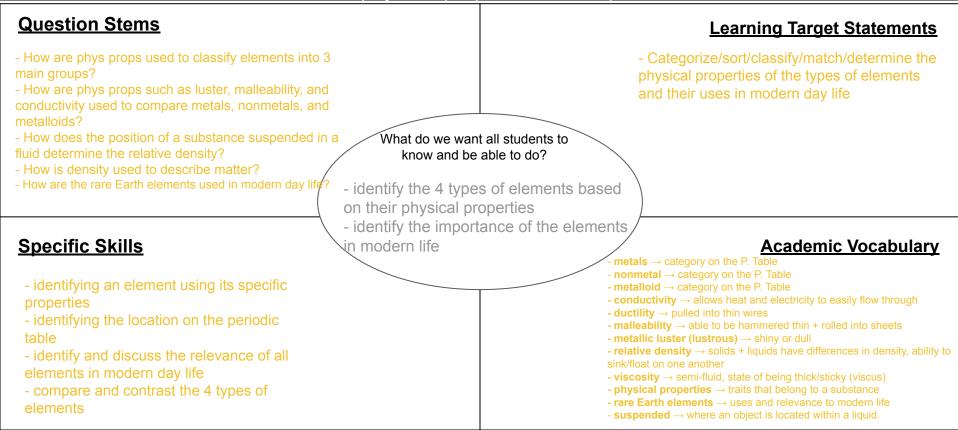
- understand the difference between a pure substance and a mixture
- further understand the classification of mixtures into homogeneous and heterogeneous.
- Describe/draw/identify the particles that represent a homogeneous and heterogeneous mixture.

Specific Skills

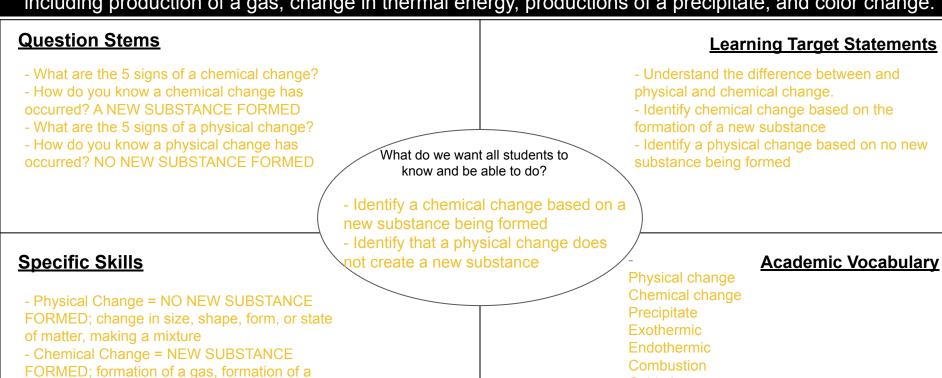
- Identify the differences between a pure substance and mixture
- Distinguish between the two types of mixtures (homogeneous and heterogeneous.
- Students will be given opportunities to identity pure substances, and the two types of mixtures.

- homogeneous → "same"; particles evenly spread out (i.e. cheese slice, milk, lemonade, soda)
- heterogeneous → "different"; particles NOT evenly spread out (i.e. cereal + milk, oil +
- vinegar, salad dressing
- pure substance \rightarrow sme atoms joined in the same combination
- mixture \rightarrow blend of two or more substances

(6.6C) Identify elements on the periodic table as metals, nonmetals, metalloids, and rare Earth elements based on their physical properties and importance to modern life.



(6.6E) Identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, productions of a precipitate, and color change.



precipitate, color change, temperature change, or

release of light energy

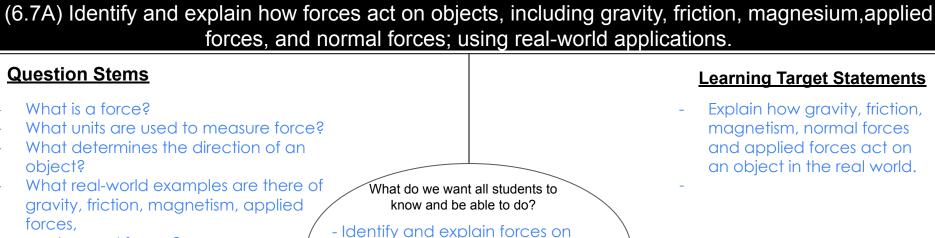
Oxidation

Sublimation

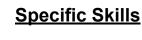
Tarnishing ripening

FORCE, MOTION, and ENERGY

forces, and normal forces; using real-world applications.



objects (push/pull)



Identify each type of force

and normal forces?

- Explain the movement of the force
 - Describe real world examples of each force

- **Academic Vocabulary**
- Position

Force

Motion

- Gravity Friction
- Magnetism
- **Applied Force**
- **Normal Force**
- Movement
- **Newtons**

(6.7B) Calculate the net force on an object in a horizontal or vertical direction using diagrams and determine if the forces are balanced or unbalanced.

Question Stems

- How is net force calculated?
- What changes occur to position as a result of an unbalanced force applied to a motionless object?
- What changes occur to direction as a result of an unbalanced force applied to an object in motion?

Specific Skills

- Calculate net force
- Determine if forces are balanced or unbalanced
- Distinguish between horizontal and vertical

What do we want all students to know and be able to do?

- -Calculate horizontal and vertical net force using diagrams
- Identify forces as balanced or \unbalanced

Learning Target Statements

- Identify balanced and unbalanced forces based on diagrams
- Calculate net force
- Distinguish between horizontal and vertical force pairs

- Balanced
- Unbalanced
 - Net Force
- Magnitude
- Horizontal
- Vertical

(6.7C) Identify simultaneous force pairs that are equal in magnitude and opposite in direction that result from the interactions between objects using Newton's Third Law of Motion.

Question Stems

- What is an action reaction pair and give an example.
- Who discovered action reaction pairs?

Learning Target Statements

Identify action and reaction examples and who discovered them

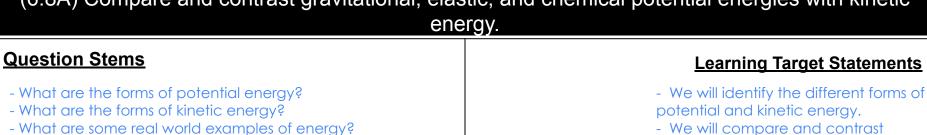
- What do we want all students to know and be able to do?
- Identify action/reaction force pairsCompare and contrast
- applied and normal forces

Specific Skills

- Identify that every action has a reaction
- Understand who Sir Isaac Newton is

- Action / Reaction
- Newton's 3rd Law

(6.8A) Compare and contrast gravitational, elastic, and chemical potential energies with kinetic energy.



kinetic energy forms

What do we want all students to know and be able to do? Identify, compare and contrast potential and

Academic Vocabulary

Specific Skills

- -Identify forms of Kinetic energy (mechanical, electrical,
- thermal, radiant, sound)
- Identify forms of Potential energy (gravitational, elastic, chemical)
- **Recognize** the factors that affect the types of energies (height, compression, matter) - **Recognize** the forms present in energy systems in the real world.

Potential energy - stored energy

potential and kinetic energy forms.

- **Gravitational** = height **Elastic** = tension or compression
- **Chemical** = inside matter (in the chemical bonds)
- **Kinetic energy** = energy of motion
- Mechanical = movement
- **Electrical** = electricity
- **Light/Radiant** = light Thermal = heat
- Sound = noise

(6.8B) Describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or photosynthesis.

What do we want all students

to know and be able to do?

photosynthesis.

through examples such as circuits, food webs, amusement parks and

Question Stems

- How do energy transformations demonstrate the law of conservation of energy?
- If energy increases in one part of a transformation, what happens to the energy at the other end of the transformation?
- How can energy transformations be demonstrated. in photosynthesis, an ecosystem, an amusement park, or an electrical circuit? -Identify energy transformations

Specific Skills

- -Identify forms of potential and kinetic energy in different transformations such as photosynthesis and food webs.
- Describe how energy is conserved through the law of conservation of energy

Learning Target Statements

- We describe how energy is conserved through transformations.
- We will describe how the total amount of energy remains the same through all energy transformations.
- We will identify different types of energy as it transfers from one form to another.

- Photosynthesis
- Food Webs
- Electrical Circuits
- Law of Conservation of Energy
- Energy Transformation

(6.8C) Explain how energy is transferred through transverse and longitudinal waves.

Question Stems

- What is the difference between the movement of a transverse wave and a longitudinal wave?
- How is energy transferred through longitudinal waves?
- How is energy transferred through transverse waves?
- What are some real world examples of transverse and longitudinal waves?

Specific Skills

- Compare and contrast transverse and longitudinal waves.
- Identify the way energy is transferred through each type of wave.

What do we want all students to know and be able to do?

 Identify the two types of waves & the movement of energy through those waves.

Learning Target Statements

- We will explain how energy is transferred through transverse waves.
- We will explain how energy is transferred through longitudinal waves.
- We will identify transverse and longitudinal waves in the real world.

- Transverse Waves
- Longitudinal Waves
- Crest & trough (optional vocab for support)
- Perpendicular
- Parallel

(6.9A) Model and illustrate how the tilted Earth revolves around the Sun, causing changes in seasons.

Question Stems

- What is a rotation?
- What is a revolution?
- What 4 seasons do we experience on Farth and in what order?
- How do rotations and revolutions cause day and night on Earth?

Learning Target Statements

- We will explain how the rotation of the Earth gives us day/night.
- We will explain how the revolution of the Earth and the tilt on the axis gives us seasons.

Specific Skills

Compare and contrast a rotation and a revolution.

correct order

- Identify what causes the Earth
- to have day and night? Understand the daylight hours
- (most/least/equal) Identify the Earth's hemispheres
- Understand the 4 seasons in the

Identify how the the Earth's tilt on the axis and revolution creates seasons.

What do we want all students

to know and be able to do?

- Rotation
- Revolution
- Axis
- Tilt Eauator
- Hemisphere Seasons (Spring, Summer, Fall/Autumn,
- Winter)
- Solstice
- Equinox

(6.9B) Describe and predict how the positions of the Earth, Sun and Moon cause daily, Spring, and Neap cycles of ocean tides due to gravitational forces.

Question Stems

- What are tides?
- What causes the Earth's ocean tides?
- What are the two different types of tides?
- What type has the strongest aravitational pull?
 - What type of tide has the weakest gravitational pull?

Specific Skills

- Explain what an ocean tide is.
- Identify the 4 main moon phases that determine tides (new/first quarter/full/third quarter)
- Identify the greatest difference between high and low tides

What do we want all students

to know and be able to do?

Describe and predict how the Earth, Sun, and moon's position causes daily Spring and Neap tides.

Learning Target Statements

- We will describe how the Earth's position causes daily tides.
- We will compare and contrast spring and neap tides.
- We will predict how the Moon will cause a daily tide.

- Tides
- Neap
- Spring Gravity
- Full Moon
- New Moon
- First Quarter
- Third/Last Quarter

(6.10A) Differentiate between the biosphere, hydrosphere, atmosphere, and geosphere and identify components of each system.

What do we want all students

to know and be able to do?

Identify the 4 spheres of the Earth.

Question Stems

- What are the identifying characteristics of the biosphere, hydrosphere, atmosphere, and geosphere?
- What are the greek roots of each prefix?
- What are some examples within each sphere?
- How do the spheres interact with each other?

Specific Skills

- Give multiple examples of things that belong to each sphere.
- Give examples of two spheres interacting with one another.
- Identify the different spheres of Earth within a picture.

Learning Target Statements

- We will identify the 4 spheres of the Earth.
- We will describe the relationships and interactions between the different Earths spheres.

- Biosphere
- Hydrosphere
- Atmosphere
- Geosphere
- "Hydro"
- "Atmo"
- "Geo"
- "Bio"

(6.10B) Model and describe the layers of Earth, including the inner core, outer core, mantle, and crust.

What do we want all students

to know and be able to do?

Model and describe the layers of the Earth.

Question Stems

- What are the 4 main layers of the Earth from the outermost to innermost?Which layer of the Earth contains
- convection currents?
- Which layer of Earth has the greatest pressure, density, and temperature?
- What state of matter is the inner core?
 Outer core?

<u>Learning Target Statements</u>

- We will **identify** the different layers of the Earth.

 We will **describe** the
- composition of each Earth Layer.
- We will **sort** the Earth Layers based on their densities.

Specific Skills

- Identify the layers of the Earth.
- Compare and contrast the thickness, density, temperature, and pressure of each Earth layer.
- Sort the Earth layers based on density.
- Model the layers of the Earth using lab materials.
- Build a model to represent the different layers.
- Identify the layer of Earth that contains convection currents.

- Inner Core
- Outer Core
- Mantle
- Crust
- Lithamhara
- Lithosphere Mesosphere (Upper Mantle + Lower
- Mantle)
- Convection Current
- Density
- Semi-Solid
- State of Matter

(6.10C) Describe how metamorphic, igneous, and sedimentary rocks form and change through the geological process in the rock cycle.

Question Stems

- What are the 5 processes and 5 products of the rock cycle?
 - the 3 main types of rocks?
 - What location would each type of rock be found in?
 - Can you describe how a rock can move forwards and backwards through the rock cycle?

What criteria/characteristics classifies

Specific Skills

- Classify by certain criteria such as process of formation and location found.
 - Know the specific characteristics that belong to each rock type.
 - Understand all parts of the rock cycle.

Learning Target Statements

- We will investigate/describe/analyze the physical characteristics of each type of rock. We will group/classify/categorize rock
- samples and descriptions.
- We will **construct** the rock cycle including processes and products.

Ianeous

-Cooling

-Glassy

rocks including their processes and products within the rock cycle.

What do we want all students

to know and be able to do?

Classify and describe the 3 types of

- Sedimentary -Compaction

Academic Vocabulary

Sediments

-Frosion

Product

-Weathering

-Deposition

-Cementation - layers - fossils

layers/bands

- Striations

- Metamorphic
- -Heat
- -Intrusive - Large crystals Magma -Pressure -Air holes - Folded

 - -Extrusive

-Solidification

-meltina Process

(6.13A) Describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function.

Question Stems

- What is the basic unit of life?
- What is the definition of an organism?
- What are the 3 parts of the cell theory?

What do we want all students to know and be able to do? Understand and describe the history

of the cell theory.

Specific Skills

- Recognize that cells are the basic unit of life.
- Describe the history of the cell theory.
- Identify the 3 parts of the cell theory.

Learning Target Statements

- I can describe the history of the cell theory.
- I can explain how organisms are composed of one or more cells which are the basic unit of life.
- I can understand that all living things come from pre-existing cells.

- Cell
- Cell Theory
- Oraanism Atom
- - Robert Hooke
 - Matthies Schleiden
 - Anton Van Leeuwenhoek
- Microscope

(6.13B) Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic.

> What do we want all students to know and be able to do?

Question Stems

- What is the difference between unicellular and multicellular?
- What are the basic characteristics of organisms?

Identify and compare the differences between basic characteristics of life.

Specific Skills

- Identify the basic characteristics of organisms.
 - Compare and contrast the different characteristics of life.

Learning Target Statements

I can identify, compare, and contrast the characteristics of life.

Academic Vocabulary

- Organization of Life (tissue.
- Omnivore
- Prokaryote

Carnivore

Herbivore

- Eukarvote Prokaryotic cells
- Eukaryotic cells
- Heterotroph (consumer) Cell Tissue
- Organ
- - Organ System Organism

Unicellular

organism)

Multicellular

organ, organ system,

Autotroph (producer)

(6.12C) Describe the hierarchical organization of organism, population, and community within an ecosystem.

Question Stems

- What is the difference between biotic and abiotic factors in an ecosystem?
- What are the 4 parts of an ecosystem?
- How can biotic and abiotic factors interact with each other?
- What is the difference between a population, community, and ecosystem?

What do we want all students to know and be able to do?

Describe the levels of organization within an ecosystem.

Learning Target Statements

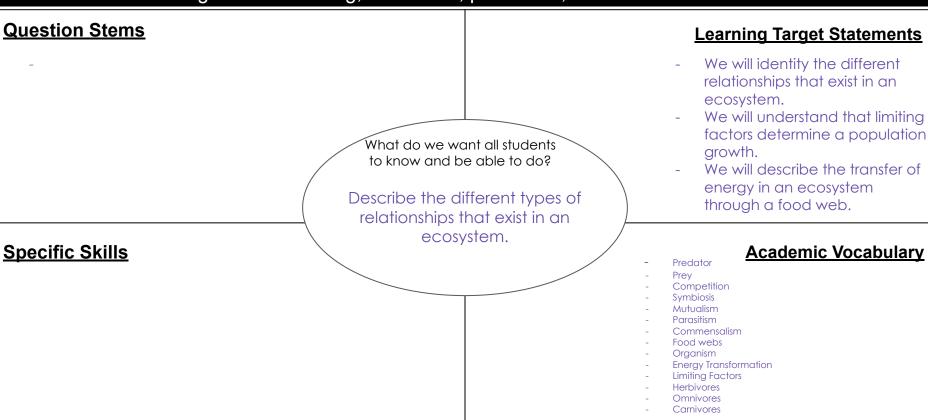
- We will identify the 4 sections of an ecosystem
- We will identify biotic and abiotic components of an ecosystem.
- We will describe the differences between an organism, population, community, and ecosystem.

Specific Skills

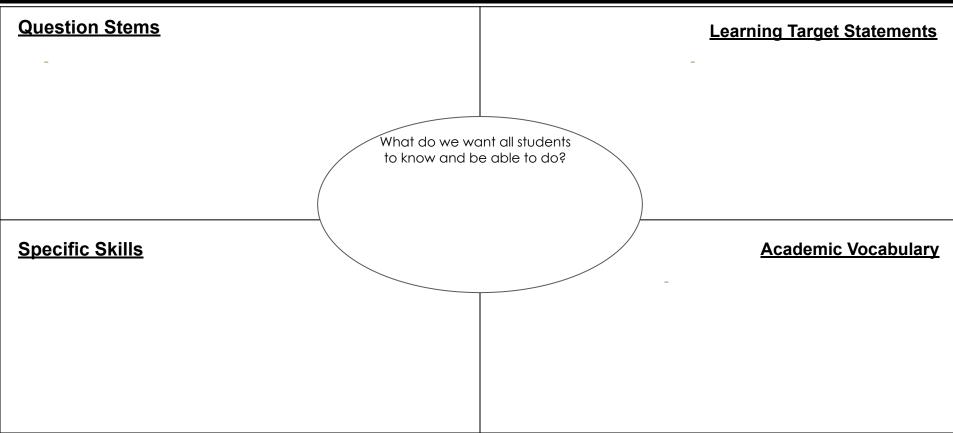
- Describe an organism.
- Describe a community.
- Describe a population.
- Identify the interactions between the abiotic and biotic factors of an ecosystem.

- Hierarchical
- Organism
- Population
- Community
- EcosystemOrganism
- Biotic
- Abiotic

(6.12B) Describe and give examples of predatory, competitive, and symbiotic relationships between organisms including, mutualism, parasitism, and commensalism.

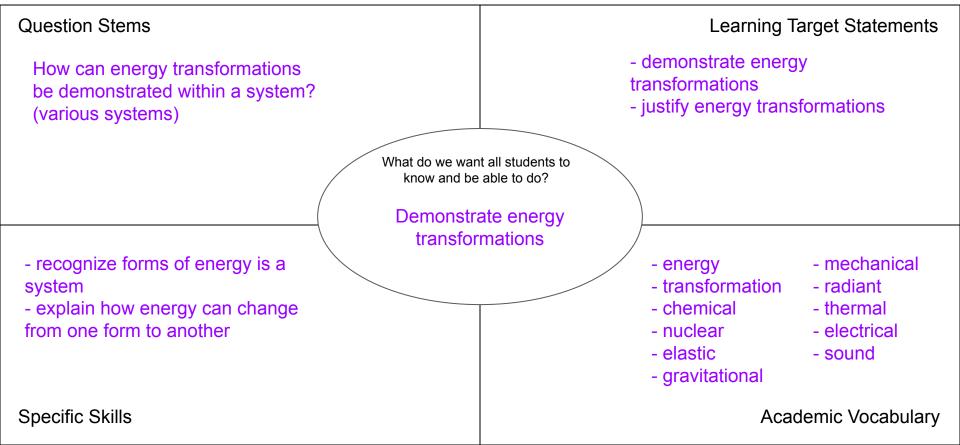


(6.12A) Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food, and abiotic factors such as availability of light and water, range and temperatures, or soil composition.



ENERGY TRANSFORMATIONS

(6.9C) Demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy.



CHARACTERISTICS OF LIVING THINGS

(6.12D) Identify the basic characteristics of organisms including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode or reproduction that further classify them into currently recognized kingdoms.

