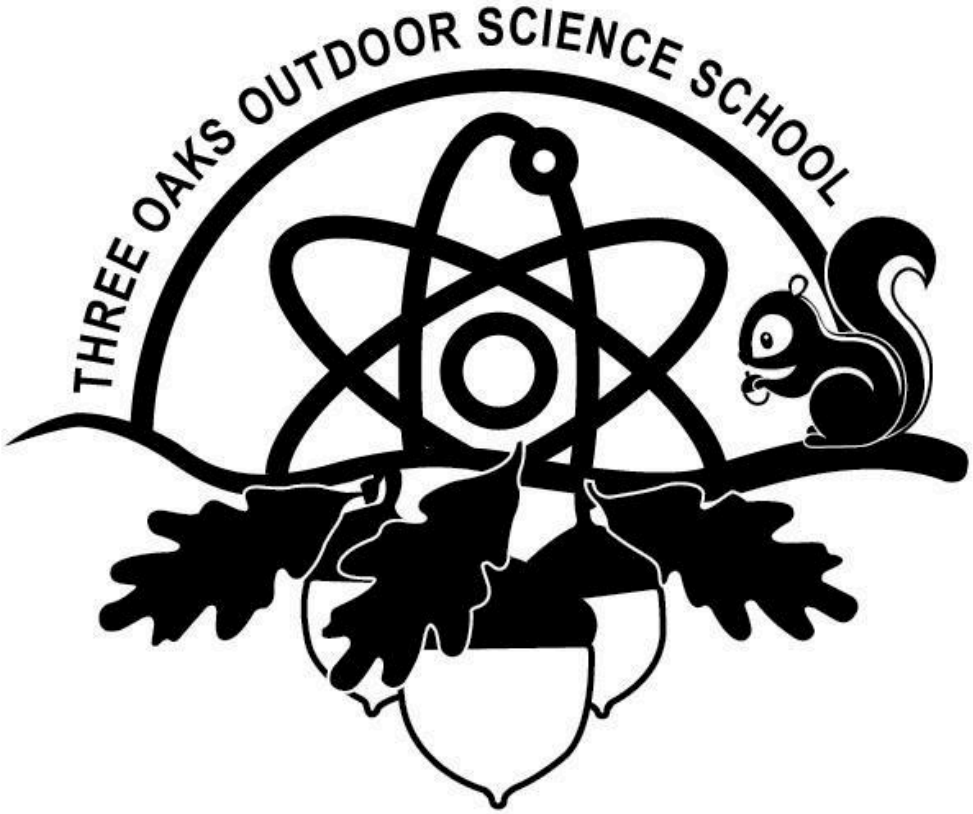


NAME: _____

SCHOOL: _____

TEACHER: _____

CABIN LEADER: _____

NATURALIST: _____

Table of Contents

Camp Life – First Day

Welcome to Camp! This is your Three Oaks OSS Field Guide! Please bring this on all the hikes so you can make observations, record data, and practice thinking like a scientist.

My cabin name is:

What are you most excited about this week?

What are you most fearful about this week? How might you overcome that fear?

What are three personal goals you would like to accomplish this week?

1.

2.

3.

Anyone can be a scientist, but there are two skills you have to master. Making an **observation** and **asking questions**. If you can make observations and ask questions all week, you will be a scientist in no time!

Use the space below to draw one thing you observed on your first hike this week.

What did it remind you of from back home?

What is one question you have about what you observed on your first hike of the week?

Biotic and Abiotic Factors

Ecosystems are made of biotic (living) and abiotic (non-living) factors. Label each item below with either A for "abiotic" or B for "biotic".

Rock _____ Squirrel _____

Coulter Pinecone _____ Water _____

Wind _____ Mushroom _____

Bobcat _____ Canyon Live Oak _____

Sunlight _____ Cotton T-Shirt _____

What is something **biotic** you can find at home/school?

What is something **abiotic** you can find at home/school?

Renewable and Non-renewable Resources

Resources can be either renewable or non-renewable. Label each resource below with either R for "renewable" or N for "non-renewable".

Solar Energy _____ Steel _____

Wind _____ Water _____

Oil _____ Natural Gas _____

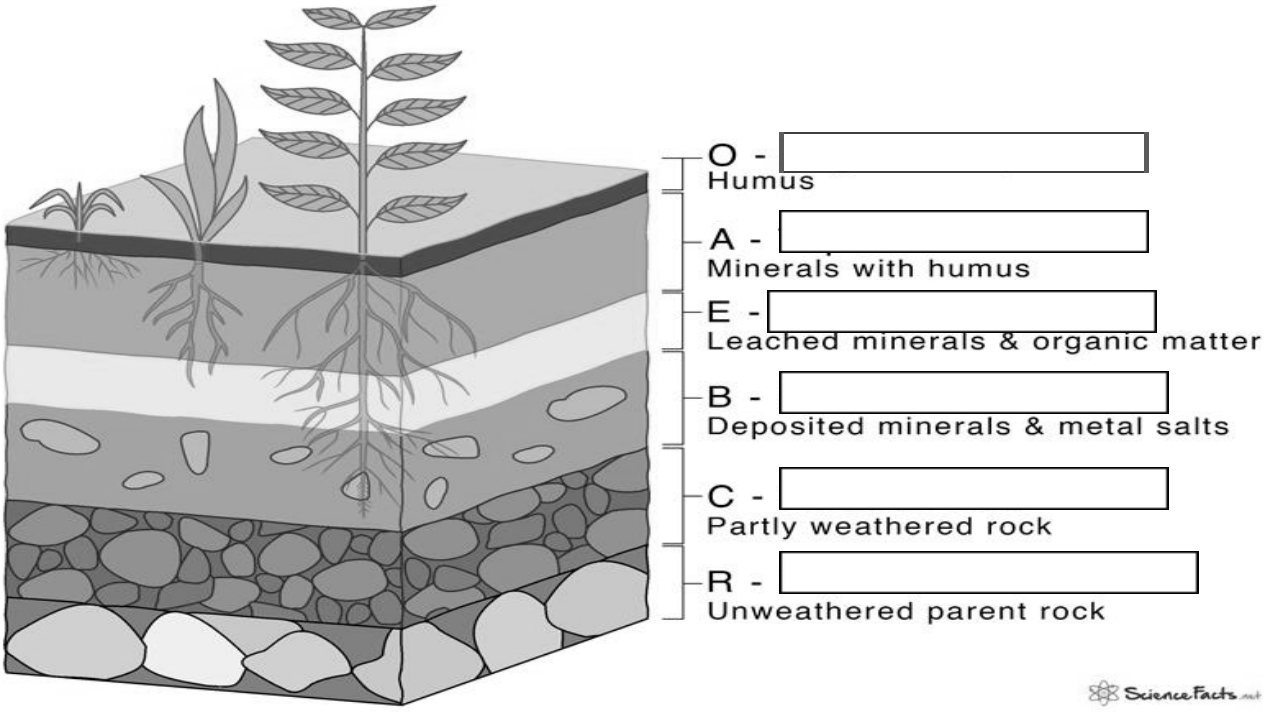
Trees _____ Coal _____

The management of resources that provide for the future is known as:

A. Conservation B. Reservation C. Moderation

Got Dirt?

Organic Layer	Topsoil	Eluviation Layer
Subsoil	Parent Rock	Bedrock



Based on the chart above, is soil **Biotic** or **Abiotic** or **Both**? Why?

If you found a fossil in the Topsoil Layer and a fossil in the Subsoil Layer, which would be older? Why?

What are some ways that we conserve our resources at camp?

What are some ways you can conserve resources at school?

What are some ways you can conserve resources at home?

Biosphere

The regions of Earth occupied by living organisms is known as the _____.

There are 4 basic survival needs that all plants and animals (including humans) require to live. List them below.

1. _____ 2. _____ 3. _____ 4. _____

The environment in which an animal can exist, providing all things needed, is known as a(n):

A. Habitat B. Campsite C. Ecosystem D. Biosphere

If an animal does not have the resources it needs, it must _____, _____, OR _____. (HINT: M.A.D.)

Draw a picture of each resource you saw while hiking:

Adaptations

Circle the correct scientific term for each definition below.

An area in which plants, animals, and microbes interact with each other and their environment.

A. Adaptation B. Ecosystem C. Niche

A specialized physical or behavioral characteristic of an organism that helps it to survive more easily in its environment.

A. Adaptation B. Ecosystem C. Niche

In ecology, the specific environmental conditions to which an organism has adapted.

A. Adaptation B. Ecosystem C. Niche

What is <u>one</u> PLANT you observed on your hike? What is an adaptation that PLANT has? What is its function? Draw and write below.

What is <u>one</u> ANIMAL or BUG you saw on your hike? What is an adaptation that an animal has? What is its function? Draw and write below.

What other questions do you have about the plants and animals on your hike?

An organism that makes its own energy from non-living substances in its environment is called a(n):

AUTOTROPH HETEROTROPH

An organism that obtains energy by consuming other organisms (such as plants and animals) is called a(n):

AUTOTROPH HETEROTROPH

Plant Life

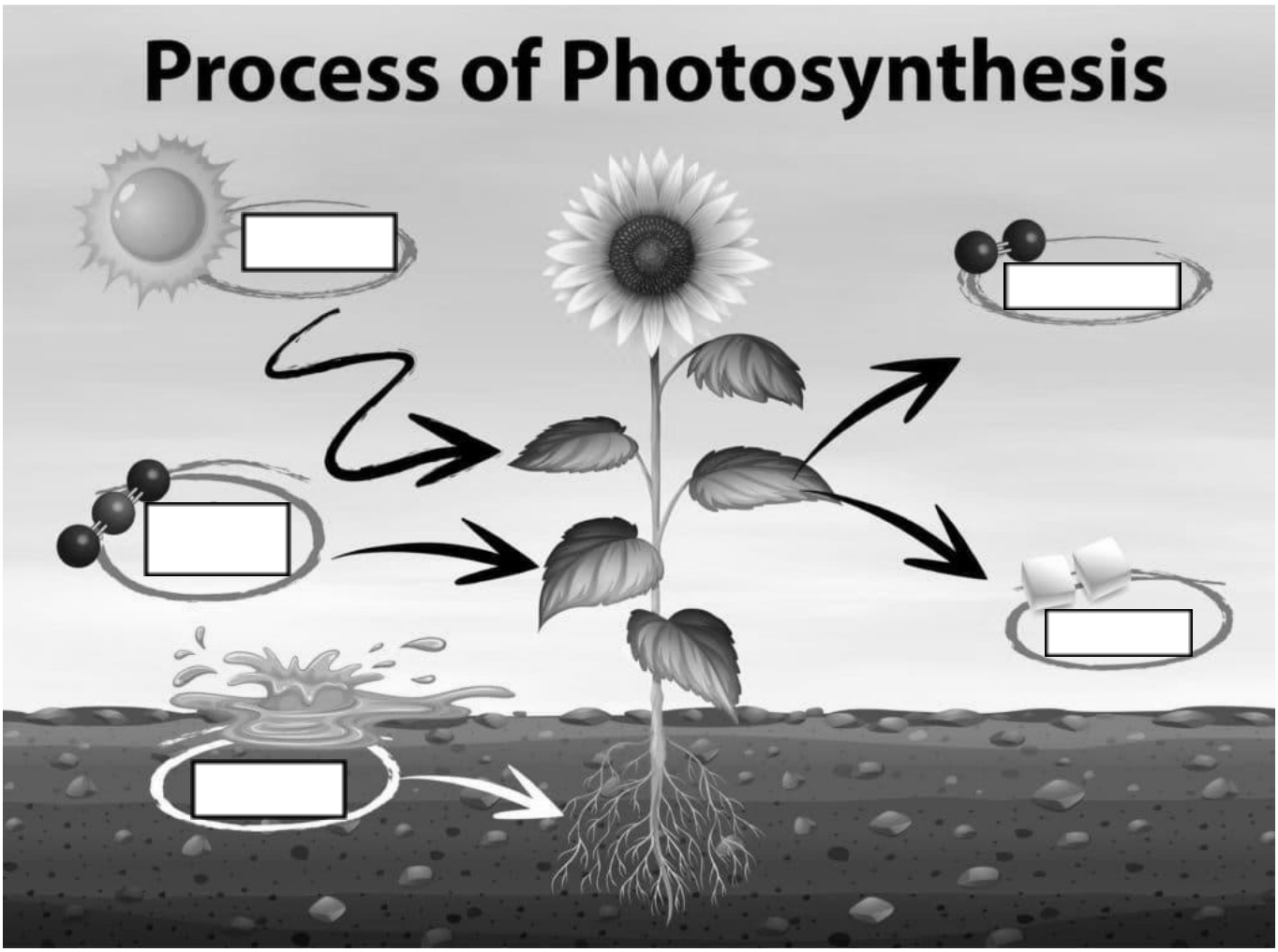
The process by which green plants produce food is known as _____.

The green pigment in plants used in absorbing light energy required for photosynthesis is called:

A. Chlorine B. Clorox C. Chlorophyll

Use the word bank below to fill in the inputs and outputs of photosynthesis.

Oxygen (O_2)	Water (H_2O)	Carbon Dioxide (CO_2)
Sunlight	Glucose ($C_6H_{12}O_6$)	

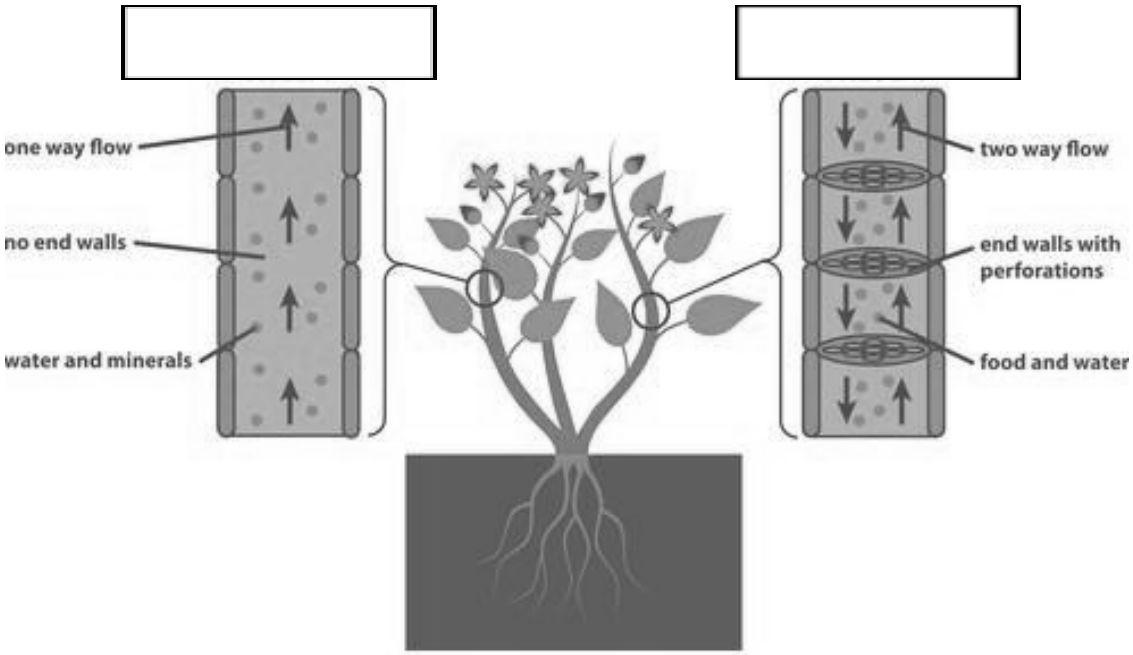


Plant Life

Xylem is the strong tissue in plant roots and stems made of tiny tubes that carry _____ and nutrients from the roots to the stems and leaves.

Phloem is a special tissue made of tubes and fibers in the stems and roots of plants. It carries _____ substances (PICK ONE: up/down) from the stem from the leaves to the other parts of the plant.

Correctly label each structure as either XYLEM or PHLOEM.



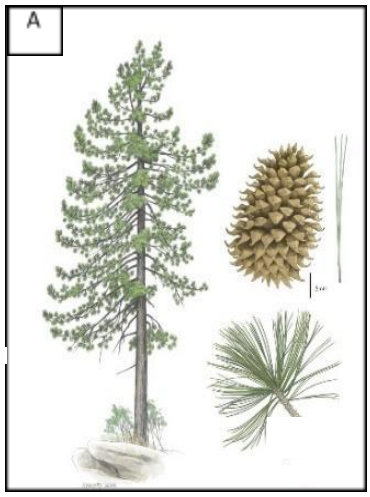
_____ is the process of evaporation or loss of water in plants.

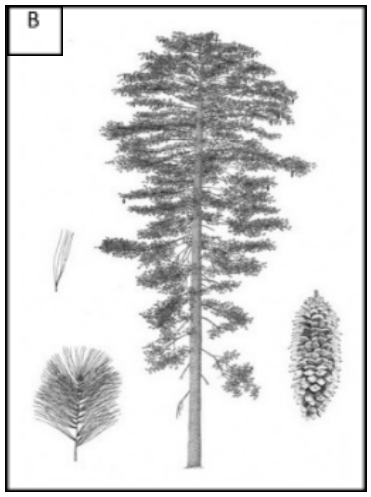
Plants that have broad leaves that shed seasonally (usually in autumn) and use flowers to reproduce are called _____.

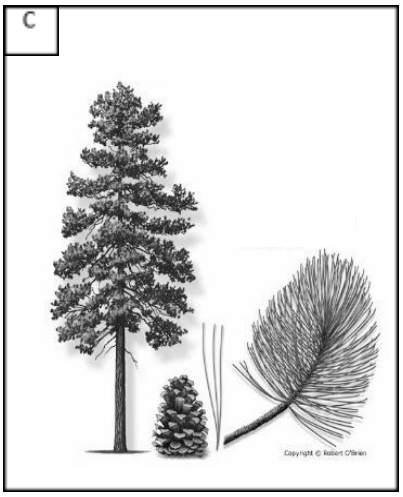
Plants that have needles or scales, stay green all year round, and use cones to reproduce are called _____.

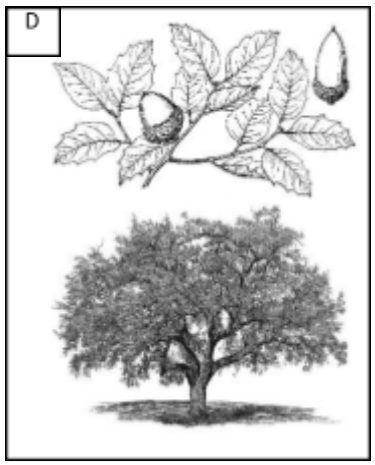
TREE IDENTIFICATION

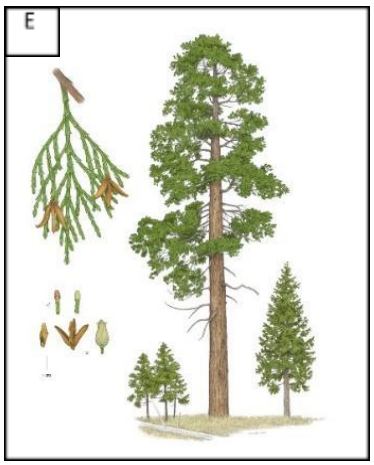
Correctly identify each tree you might find at Three Oaks OSS.











____ Sugar Pine ____ Incense Cedar ____ Ponderosa Pine

____ Canyon Live Oak ____ Coulter Pine

Which plant (found in the San Bernardino Mountains) is fire-resistant and will commonly begin to grow after a wildfire?

Symbiotic Relationships

Match each scientific term to the correct definition below.

A. Parasitism	_____	A symbiotic relationship in which one species lives off of another species and benefits from causing it harm.
B. Mutualism	_____	A symbiotic relationship in which one species benefits while the other is neither helped nor harmed by the association.
C. Commensalism	_____	A symbiotic relationship in which both species benefit from the association.

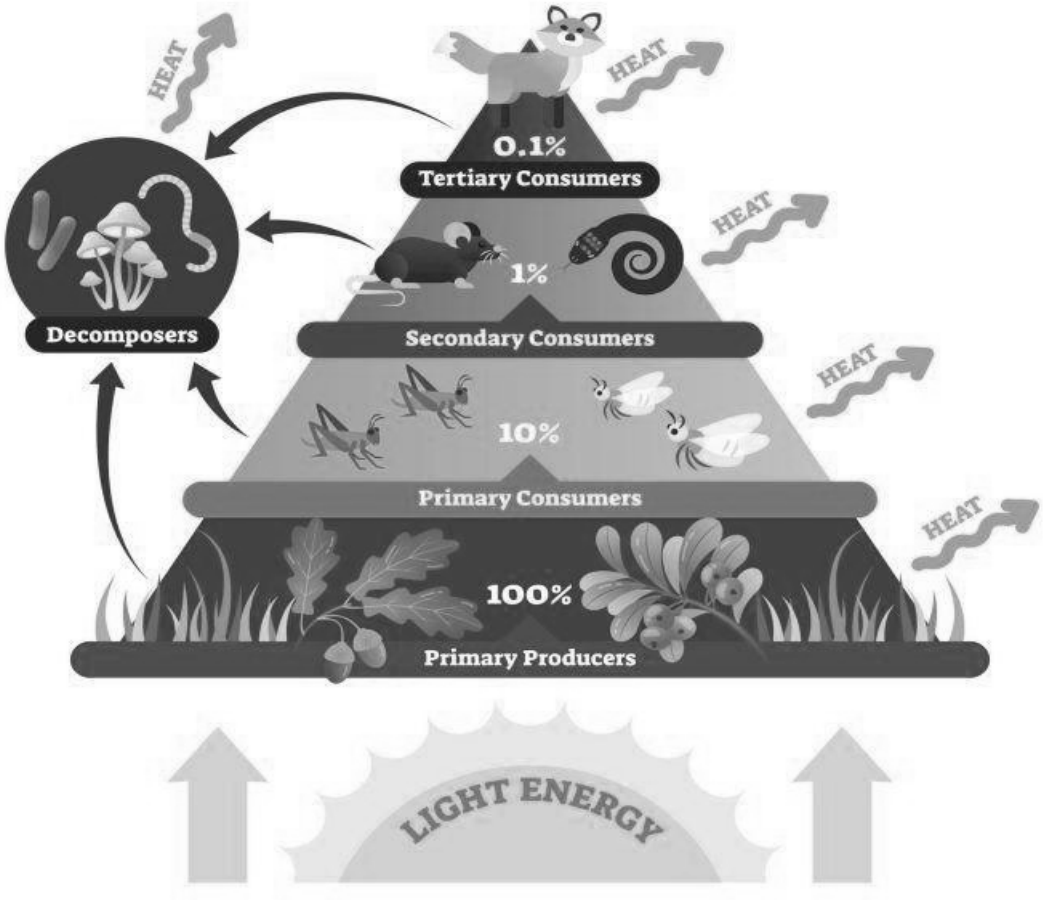
Write or draw an example of **parasitism** found at camp.

Write or draw an example of **mutualism** found at camp.

Write or draw an example of **commensalism** found at camp.

Energy Pyramid

Using the image on this page, answer the following questions.



1. Where does all the energy on our planet originally come from?

2. What types of organisms convert the Sun's energy into a usable form?

3. What would happen to consumers if there were no producers?

4. What percent of energy is lost at each **trophic level of the food pyramid**? Where does that energy go?

5. What would happen if there were no decomposers?

A factor which limits the growth or reproduction of an organism or population is called a(n) _____.

Draw your favorite animal you saw this week. Where would it fit into the food pyramid?

Geosphere

The portion of Earth's systems that relates to the structure and formation of the planet's landforms, interior, rocks, and minerals is known as the _____.

What is the scientific study of the Earth, its structure, history, and the forces that affect it called?

Circle the correct scientific term for each definition below.

A type of rock that forms when molten rock (such as magma or lava) cools and solidifies.

A. Igneous B. Sedimentary C. Metamorphic

A type of rock that forms when particles settle out of water or air and accumulate in layers.

A. Igneous B. Sedimentary C. Metamorphic

A type of rock that forms when existing rocks are changed by environmental factors, such as heat, pressure, or reactive liquids.

A. Igneous B. Sedimentary C. Metamorphic

_____ is molten rock that is trapped beneath Earth's crust.

_____ is molten rock that reaches the surface and breaks free of Earth's crust, usually through a volcano.

Geosphere

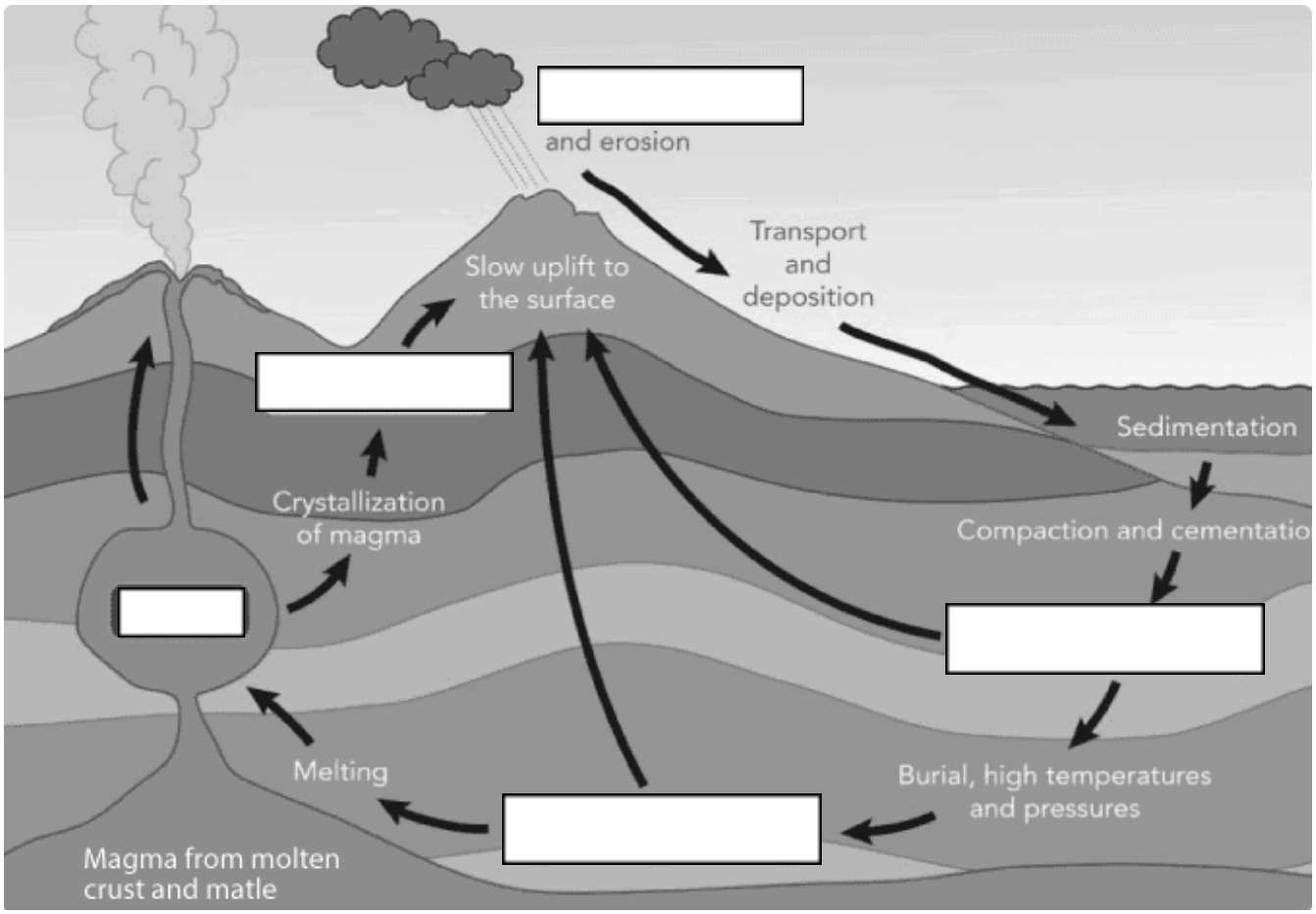
_____ is the natural process that slowly breaks apart or changes rock. It can be caused by heat, water, wind, living things, or other natural forces.

_____ is the movement of sediment from one place to another. This can be caused by wind, water, temperature, etc.

_____ are inorganic chemical compounds that occur naturally. They are the building blocks of rocks.

Use the word bank below to fill in the correct terms.

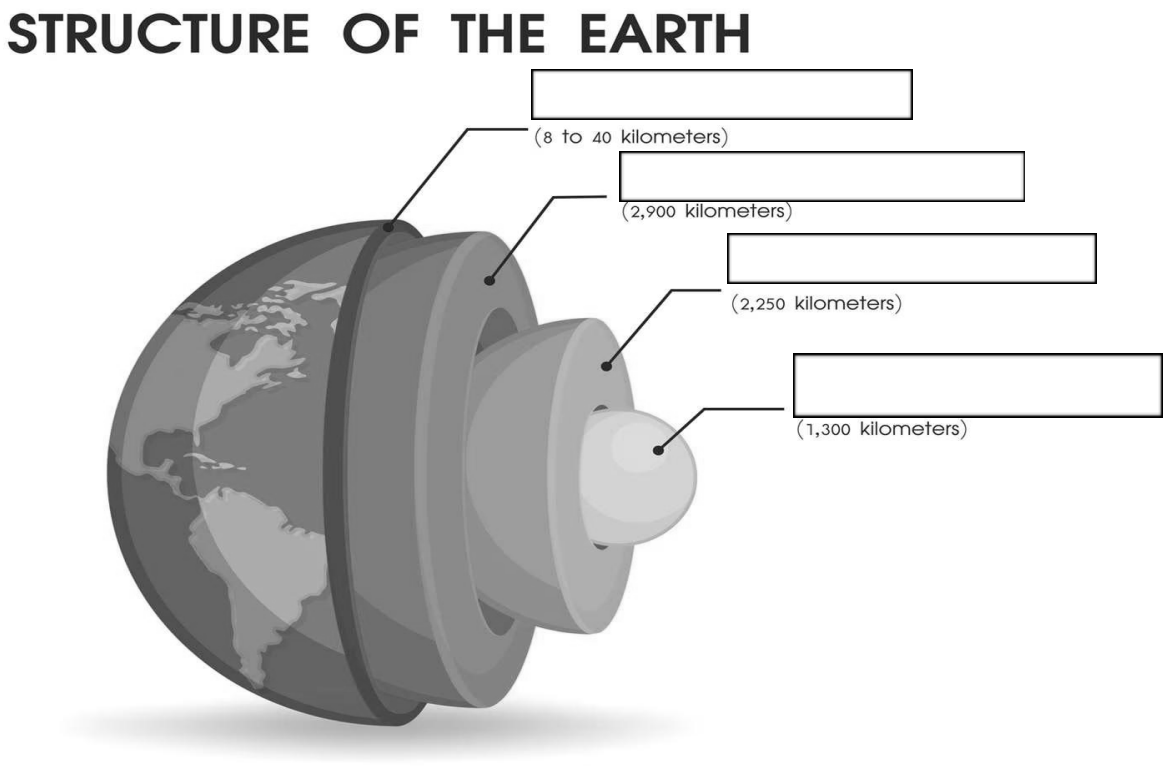
Magma		Weathering
Igneous Rock	Sedimentary Rock	Metamorphic Rock



Layers of the Earth's Crust

Use the word bank below to identify the layers of the Earth's Crust.

Crust	Mantle	Outer Core	Inner Core



Which layer of the Earth's Crust is hot molten liquid?

A. Outer Core B. Inner Core C. Pizza Crust

How many layers of the Earth's core are solid?

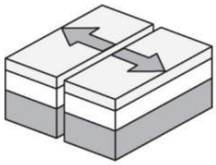
A. 1 B. 2 C. 3 D. 4

Tectonic Plates

Tectonic plates are massive, irregularly shaped slabs of solid rock that move or shift because of the intense heat in the Earth's interior.

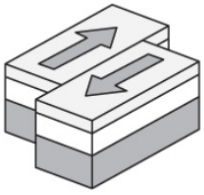
TRUE FALSE

Match each image to its correct term and definition.



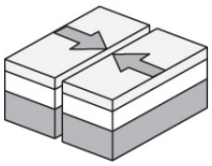
CONVERGENT

When crust is neither formed nor destroyed as two tectonic plates SLIDE PAST one another.



DIVERGENT

When crust is destroyed as two tectonic plates move TOWARD one another (creating mountains).



TRANSFORM

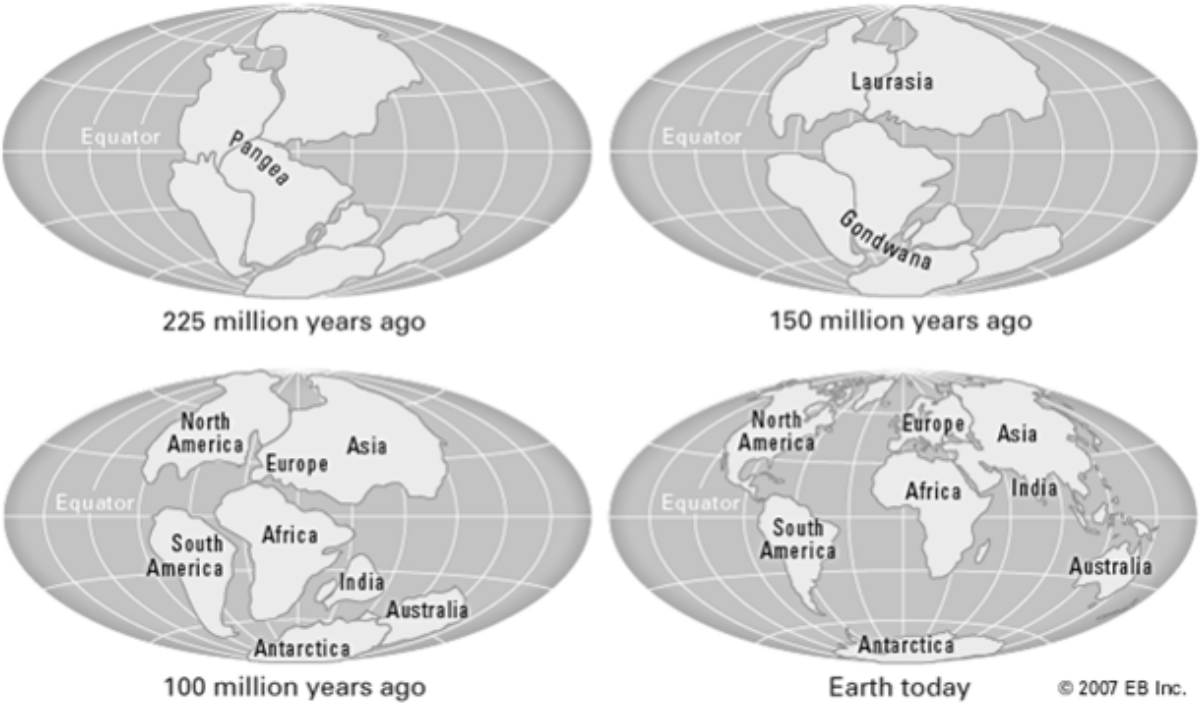
When new crust is formed as two tectonic plates move AWAY from one another (creating valleys).

What is it called when one convergent plate moves beneath another?

Tectonic Plates

The edges of tectonic plates are called **fault lines**. As tectonic plates move, sometimes the fault lines can get stuck and build pressure. When the plates suddenly break free, a(n) _____ occurs.

In Southern California, we live near the _____ Fault.



Based on the trends in the diagram above, sketch your prediction of what our planet will look like in 150 million years.

Hydrosphere

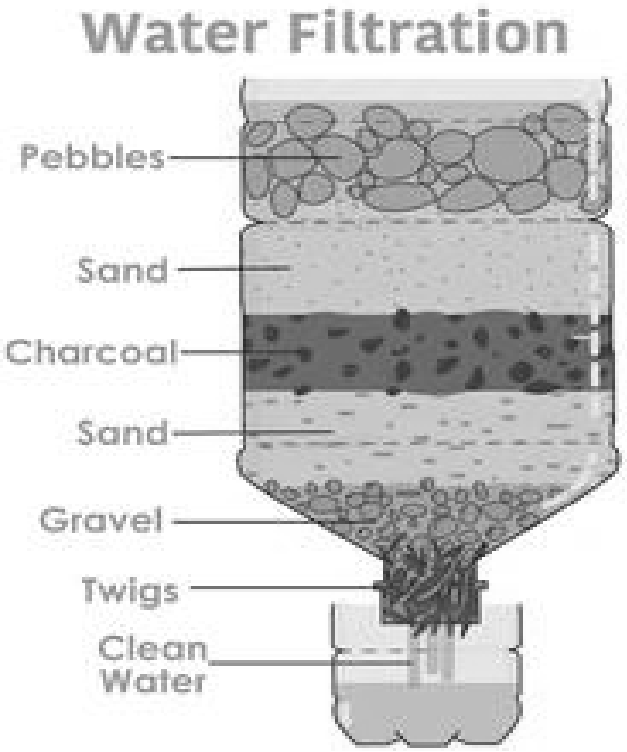
All the water on and/or surrounding the surface of the globe, including the oceans and the water in the atmosphere is known as the _____.

A majority of Earth's available water is found in the _____.

A majority of Earth's FRESH WATER is found in _____ and _____. Very little is found in lakes, streams, rivers, etc.

The filtration or passing of water through the soil and rocks to become underground water is known as:

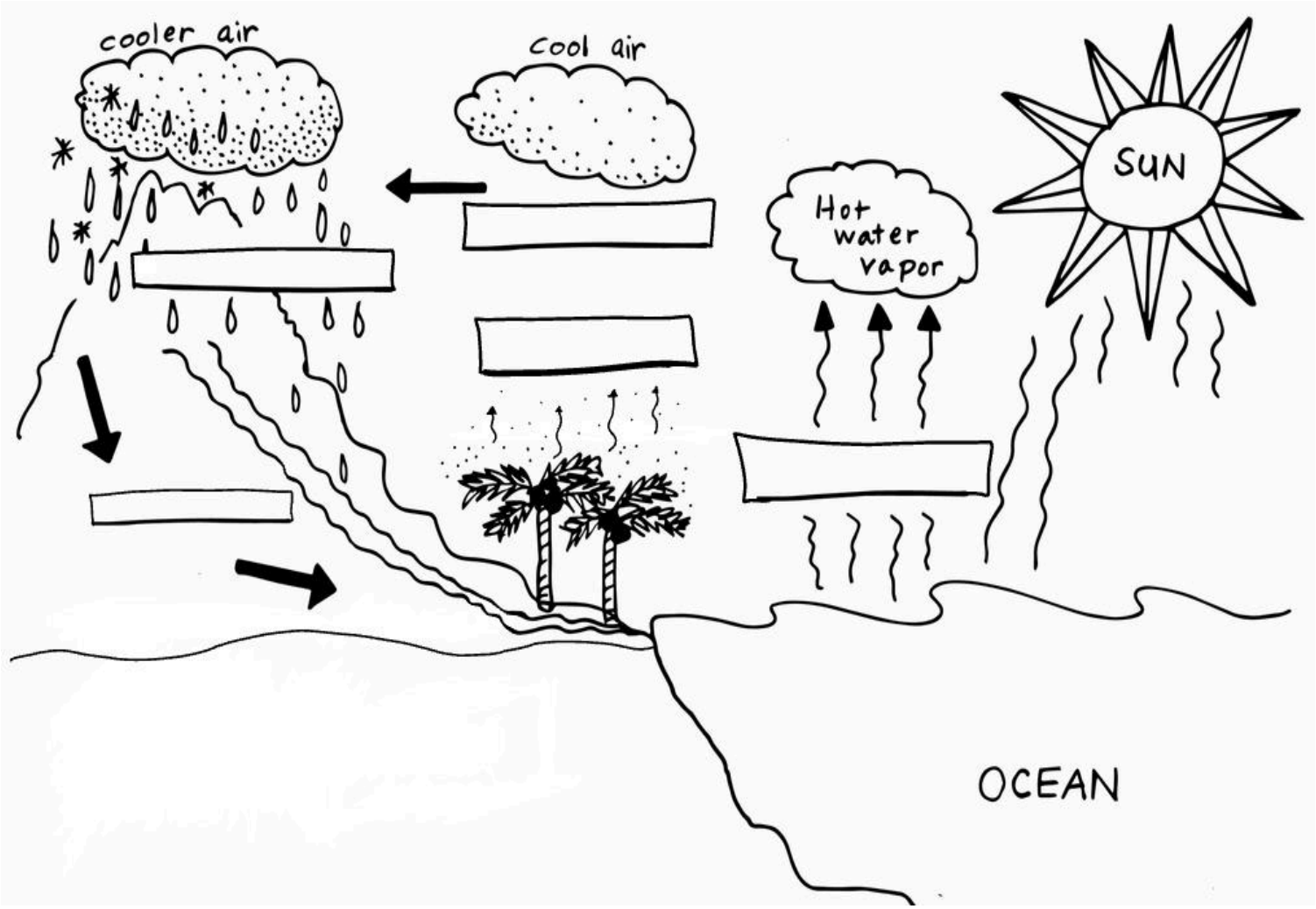
A. Percolation B. Phasing C. Preparation



How do humans affect the process of percolation? Think about the pollution of lands and waters. Be specific.

Use the word bank below to fill in the correct terms.

Condensation	Evaporation
Precipitation	
Surface Runoff	Transpiration (from plants)



Using the image above, fill in where you think Percolation and Ground Water fit into the Water Cycle.

What part of the Water Cycle did you observe on your hike?

Hydrosphere

What are the ways we conserve our limited access to water at camp?

What are ways you can continue to conserve water at school?

What are ways you can continue to conserve water at home?

Three Oaks OSS Daily Weather Tracker

During hopping at Breakfast or Dinner, record the weather conditions at Three Oaks Outdoor Science School.

Day	Tuesday	Wednesday	Thursday	Weekly Average
Temperature				
Air Pressure				
Humidity				
Precipitation				
Wind Speed and Direction				
Clouds				

How is this weather similar to the weather at home?

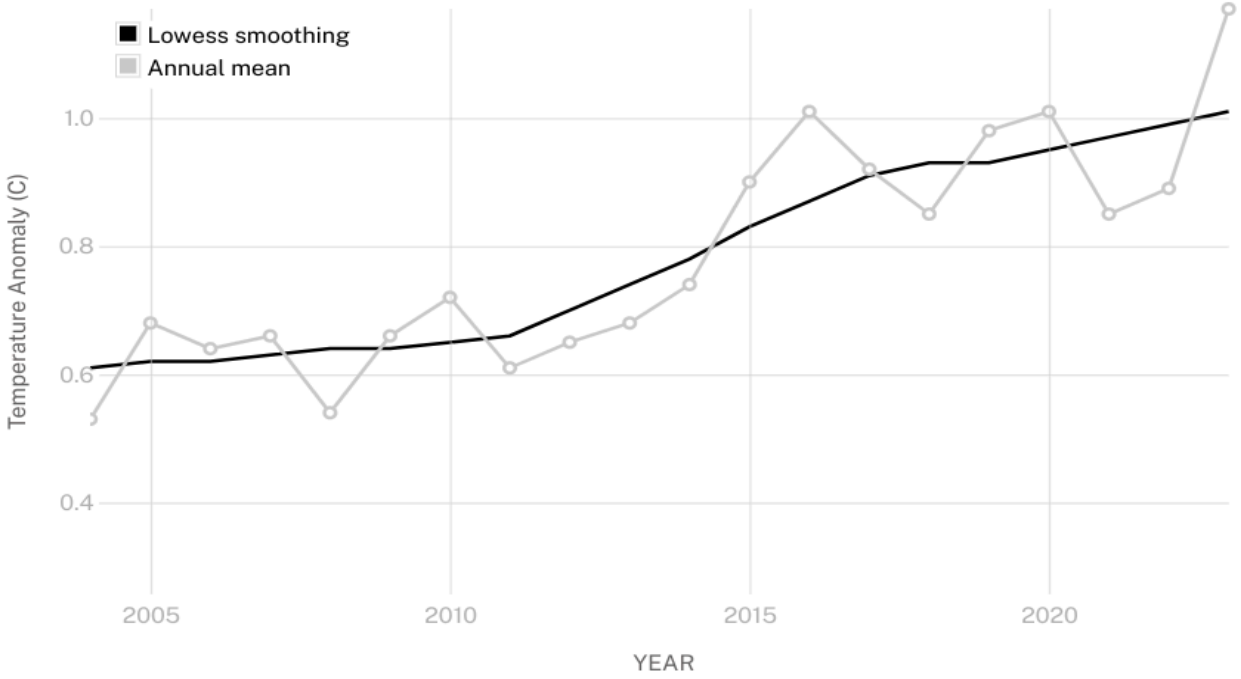
Weather is the _____-_____ atmosphere conditions and patterns.

_____ is the long-term atmosphere conditions and patterns.

Atmosphere

The layer of gases that surrounds Earth is known as the _____.

_____ are certain gases in the atmosphere that trap energy from the Sun, which warms the planet.



Based on the graph above, what predictions can you make for the future if no changes are made?

How does this affect you?

_____ _____ is a noticeable change in the long-term weather patterns of an area. It can be regional or global.

What is something YOU can do to help prevent climate change?

Astronomy

Astronomy is the scientific study of _____.

Our solar system is made up of the Sun, dozens of moons, millions of asteroids/comets/meteoroids, and how many planets?

A. 7 B. 8 C. 9 D. 10

Our solar system is located in an outer spiral arm of which galaxy?

A. Snickers B. Twix C. Milky Way

All planets in the solar system move in two different ways:

1. _____ is a planet's movement around its own axis.
2. _____ is a planet's orbital motion around the Sun.

How long does it take the Earth to make one complete rotation?

How long does it take the Earth to make one full revolution?

The _____ of the Earth, which is about 23.5 degrees, is what causes the seasons (spring, summer, autumn, and winter).

The _____ and its gravitational pull is what causes high and low tides.

Astronomy

What did the moon look like tonight? Do you think we had a low tide or a high tide?

Apparent Magnitude is a measure of the _____ of a celestial object (like a star or planet) as observed from _____.

Put the stars in order from hottest to coldest (Red, White, Blue, Yellow)

1. _____ 2. _____ 3. _____ 4. _____

What planets (if any) did you see at camp? Why were they visible?

Astronomy

The length and direction of shadows (as well as day and night) are determined by the rotation of the Earth.

TRUE FALSE

In California, we can see the same stars and constellations all year round.

TRUE FALSE

A(n) _____ is a group of stars that form a recognizable pattern that is traditionally named after its appearance or a mythological figure.

What is your favorite constellation story from camp? Draw a picture of the constellation.

Night Sensory Hike

_____ is a biological sonar that allows some animals to determine the distance, size, and location of objects without seeing them.

Identify each organism below and describe its Nocturnal Adaptation:

Circle the correct scientific term for each definition below.

Animals that are most active at dusk and dawn are:

A. Nocturnal B. Diurnal C. Crepuscular

Animals that are active during the day and sleep at night are:

A. Nocturnal B. Diurnal C. Crepuscular

Animals that are active at night and rest during the day are:

A. Nocturnal B. Diurnal C. Crepuscular

Does the night sky at camp look the same as where you live? Why do you think that is?

Rhodopsin is a light-sensitive protein that enables vision in extremely bright conditions.

TRUE FALSE

The emission of light caused by breaking chemical bonds through friction is known as:

A. Bioluminescence B. Triboluminescence C. Expecto Patronum

Draw or write a picture from a native story you heard this week. What lesson did you learned from it?

Engineering

_____ is the process of creating and building something by using math and science.

Answer the following questions based on the Engineering Station you attended with your group.

Phase 1: Make a sketch of your initial design. Label the parts and describe their functions.

Phase 2: What happened after initial testing? Was your design successful? Describe what happened to your design during testing

Engineering

Phase 3: Sketch your revised design, label the places where you made changes, and explain why you made those changes.

Phase 4: How did your revised design do in the testing process? Would you make any additional changes? Why or why not?

Camp Life – LAST Day

My skit name was:

My role in the skit was:

My favorite camp song was:

My favorite memory at camp is:

Did you accomplish the three personal goals that you listed on Day 1?

Final Thoughts

What is an Environmental Issue you learned at camp this week?

What can you do back at home to help solve this issue?

When did you feel the bravest this week?

How can you continue practicing conservation when you leave camp?

Glossary

Abiotic: The non-living components of an ecosystem.

Adaptation: A specialized physical or behavioral characteristic of an organism that helps it to survive more easily in its environment.

Apparent Magnitude: The measure of the brightness of a celestial object (like a star or planet) as observed from Earth.

Astronomy: The scientific study of outer space.

Atmosphere: The layer(s) of gas (es) surrounding a planet.

Autotroph: An organism that makes its own energy from non-living substances in its environment.

Bedrock: Solid rock underlying loose soil deposits

Biosphere: The regions of Earth occupied by living organisms.

Biotic: Living components of an ecosystem.

Biology: The study of living organisms

Chlorophyll: The green pigment in plants is used in absorbing light energy required for photosynthesis.

Climate Change: A change in the long-term weather patterns of an area. It can be regional or global.

Climate: The long-term weather patterns of an area.

Commensalism: A symbiotic relationship in which one species benefits while the other is neither helped nor harmed by the association.

Condensation: The process in which gas changes into a liquid.

Coniferous: Plants that have needles or scales, stay green all year round, and use cones to reproduce.

Conservation: The management of resources that provide for the future.

Constellation: A group of stars that form a recognizable pattern that is traditionally named after its appearance or a mythological figure.

Consumer: A living organism that cannot make its own food and feeds on living material.

Convergent: A plate boundary that occurs when the crust is destroyed as two tectonic plates move toward one another.

Crepuscular: Animals that are most active at dusk and dawn.

Crust: The outermost layer of Earth made of solid rock

Deciduous: Plants that have broad leaves that shed seasonally (usually in autumn) and use flowers to reproduce.

Decomposer: A living organism that gets energy by breaking down dead plants and animals.

Deposition: The process in which a gas changes into a solid.

Diurnal: Animals that are active during the day and sleep at night.

Divergent: A plate boundary that occurs when new crust is formed as two tectonic plates move away from one another.

Echolocation: A biological sonar that allows some animals to determine the distance, size, and location of objects without seeing them.

Ecology: The scientific study of relationships between living organisms, non-living organisms, and their environment.

Ecosystem: An area in which plants, animals, and microbes interact with each other and their environment.

Eluviation Layer: Layer where materials can be extracted by water

Engineering: The process of creating and building something by using math and science.

Erosion: The movement of sediment from one place to another.

Evaporation: The process in which liquid changes into a gas.

Fault Lines: The edges of tectonic plates.

Geology: The scientific study of the Earth, its structure, history, and the forces that affect it.

Geosphere: The portion of Earth's systems that relates to the structure and formation of the planet's landforms, interior, rocks, and minerals.

Greenhouse Gases: Certain gases in the atmosphere that trap energy from the Sun, which warms the planet.

Groundwater: The water that is found beneath the surface of the Earth between soil particles and in cracks of rocks.

Habitat: The environment in which an animal can exist, providing all things needed.

Heterotroph: An organism that obtains energy by consuming other organisms (such as plants and animals).

Humus: the organic component of soil, formed by the decomposition of leaves and other plant material by soil microorganisms.

Hydrosphere: All the water on and/or surrounding the surface of the globe, including the oceans and the water in the atmosphere.

Igneous: A type of rock that forms when molten rock (such as magma or lava) cools and solidifies.

Inner Core: the Earth's innermost layer, made up of iron and nickel, and located about 1,500 miles (2,414 km) below the surface

Lava: Molten rock that reaches the surface and breaks free of Earth's crust, usually through a volcano.

Limiting Factor: A factor that limits the growth or reproduction of an organism or population.

Magma: Molten rock that is trapped beneath Earth's crust.

Mantle: Largest and thickest layer of the Earth between the Crust and the Outer Core

Metamorphic: A type of rock that forms when existing rocks are changed by environmental factors, such as heat, pressure, or reactive liquids.

Minerals: Inorganic chemical compounds that occur naturally. They are the building blocks of rocks.

Mutualism: The symbiotic relationship in which both species benefit from the association.

Natural Resource: Something that can be found in nature that can be used by living things.

Niche: In ecology, the specific environmental conditions to which an organism has adapted.

Nocturnal: Animals that are active at night and rest during the day.

Non-renewable Resource: A resource that cannot be replaced within a human life span.

Omnivore: An animal that eats both meat and plants.

Outer core: the liquid layer of Earth's core that's located between the mantle and the inner core

Parasitism: A symbiotic relationship in which one species lives off of another species and benefits from causing it harm.

Parent Rock: The original rock from which soil forms through weathering and erosion

Percolation: The filtration or passing of water through the soil and rocks to become underground water.

Phloem: A special tissue made of tubes and fibers in the stems and roots of plants. It carries food substances down the stem from the leaves to the other parts to the plant.

Photosynthesis: The process by which green plants produce food.

Plate Tectonics: The theory outlining the structure and process of the Earth's crust and how it moves.

Precipitation: Water that falls to Earth as rain, snow, sleet, hail, or mist.

Producer: A living organism that makes its own energy through the process of photosynthesis.

Renewable Resource: A resource that cycles or can be replaced within a human life span.

Revolution: A planet's orbital motion around the Sun.

Rhodopsin: A light-sensitive protein that enables vision in low-light conditions.

Rotation: A planet's movement around its own axis.

Sedimentary: A type of rock that forms when particles settle out of water or air and accumulate in layers.

Subduction: The term for when one convergent plate is pushed beneath another.

Subsoil: Layer of soil under the Topsoil

Surface Runoff: The flow of water that occurs when excess rainwater or snowmelt can no longer penetrate saturated soil.

Symbiotic Relationship: A close physical association between two different species.

Tapetum Lucidum: A layer of tissue in the eye of many animals that reflects light causing the eyes to appear shiny.

Tectonic Plates: Massive, irregularly shaped slabs of solid rock that move or shift because of the intense heat in the Earth's interior.

Transform: A plate boundary that occurs when the crust is neither formed nor destroyed as two tectonic plates slide past one another.

Transpiration: The process of evaporation or loss of water in plants.

Triboluminescence: The emission of light caused by breaking chemical bonds through friction.

Trophic Level: Any class of organisms that occupy the same position in a food chain.

Topsoil: The rich upper layer of soil in which plants have most of their roots

Watershed: An area of land, sectioned off by changes in elevation, where all water flows to the same spot.

Weather: The short-term weather patterns of an area.

Weathering: The natural process that slowly breaks apart or changes rock.

Xylem: The strong tissue in plant roots and stems made of tiny tubes that carry water and nutrients from the roots up to the stems and leaves.