Science 9

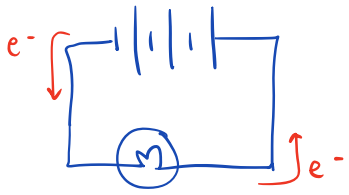
Final Exam Review: PHYSICS & EARTH SCIENCE (3 of 3)

Name: Key
Date:
Block:

Station 1: Building Circuits

Draw a **circuit diagram** for the following circuits. Be sure to identify the **direction** that current is travelling for each scenario. Once you have drawn your diagram, build the circuit using the materials provided and use the voltmeter to measure voltage. Show your teacher once each question is complete

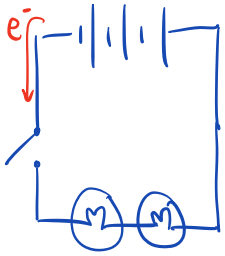
1. A circuit with a battery that turns on one lightbulb



Voltage across the lightbulb: _____

Teacher Check: _____

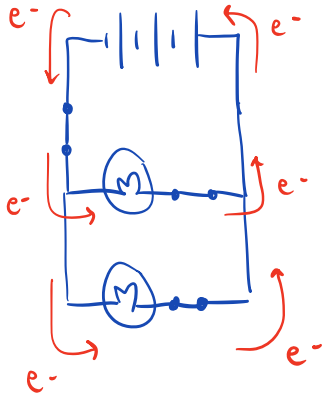
2. A circuit with a battery where an open switch has turned off two lights placed in series



Voltage across the battery: _____

Teacher Check: _____

3. A circuit with an electrochemical cell, a closed master switch, and two light bulbs all in parallel with each other. Each light bulb has its own switch that turns it on and off.

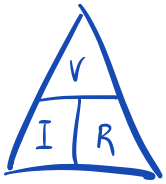


Voltage across the battery: _____

Teacher Check: _____

Station 2: Ohm's Law

	Symbol	Unit
Current	I	Amperes (A)
Voltage	V	Volts (V)
Resistance	R	Ohms (Ω)



1. What is the resistance of a toaster if a current of 12.5 A flows through it when it is connected to 120 V?

V= 120V

I= 12.5A

R= ?

$R = \frac{V}{I}$

$= \frac{120V}{12.5A}$ = **9.6Ω**

2. A light bulb has a resistance of 90 Ω. What current flows through the bulb when it is connected to 120 V?

V= 120V

I= ?

R= 90Ω

$I = \frac{V}{R}$

$= \frac{120V}{90\Omega}$ = **1.33A**

3. The current through a load in a circuit is 2.5 A. If the voltage is 75 V, what is the resistance of the load?

V= 75V

I= 2.5A

R= ?

$R = \frac{V}{I}$

$= \frac{75V}{2.5A}$ = **30Ω**

4. How much electrical (voltage) potential difference is necessary to generate 9.5 A in a circuit with 2.0 Ω?

V= ?

I= 9.5A

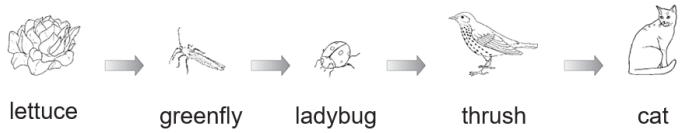
R= 20Ω

$V = I \times R$

$= 9.5A \times 20\Omega$ = **19V**

Station 3: Food Chains, Webs, and Pyramids

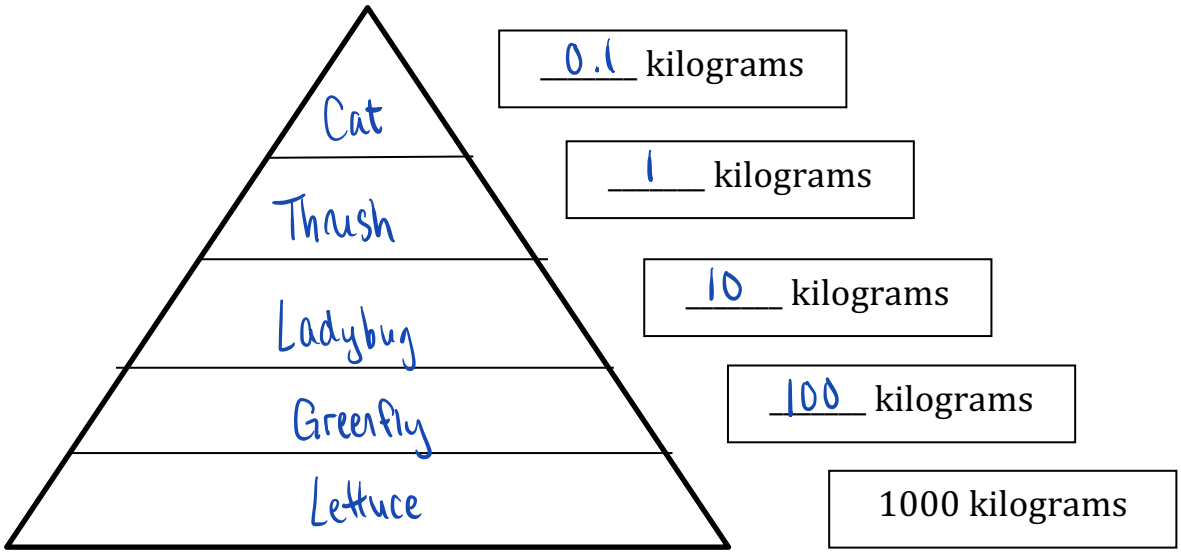
Use the following food chain:



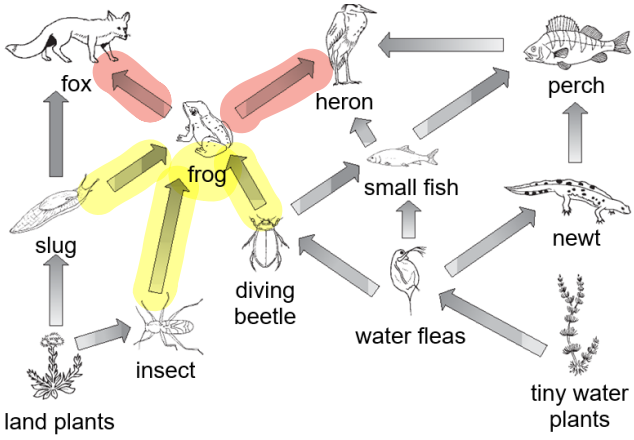
1. What does the arrow mean in a food chain?

   Flow of energy from one organism to another

2. Name the producer in the food chain: Lettuce
3. Name the 3rd trophic level in the food chain: Ladybug
4. Name the apex consumer in the food chain: Cat
5. Using the organisms in the food chain above, construct an accurate energy pyramid. Fill in the amount of energy transferred for each level



Use the following food web:



1. Name two producers in the food web.

   Land plants , Tiny water plants

2. Name the primary consumers in this community.

   Slugs, Insects, Water fleas

3. What would happen to this community if all of the frogs died suddenly?

   The population of slugs, insects, and diving beetles would increase because they now have one fewer predator. However, foxes & herons would decrease because they have one less food source.

Station 4: Summary Questions

Physics: Energy Sources and Transformations

Identify the type of energy associated with each of the following sources:

a. The Sun Solar, thermal

b. River flow Mechanical

c. A battery Chemical

d. Uranium Nuclear

e. Food Chemical

	ORIGINAL ENERGY FORM	FINAL ENERGY FORM
Photosynthesis	Solar	Chemical
Nuclear power plant	Nuclear	electrical
An oven	electrical	thermal

What is the difference between a renewable and non-renewable energy source? Provide at least 2 examples for each.

Renewable energy is energy from renewable sources (can be replaced)
ex. Sunlight (solar panels), wind (windmills), water (hydro dams)

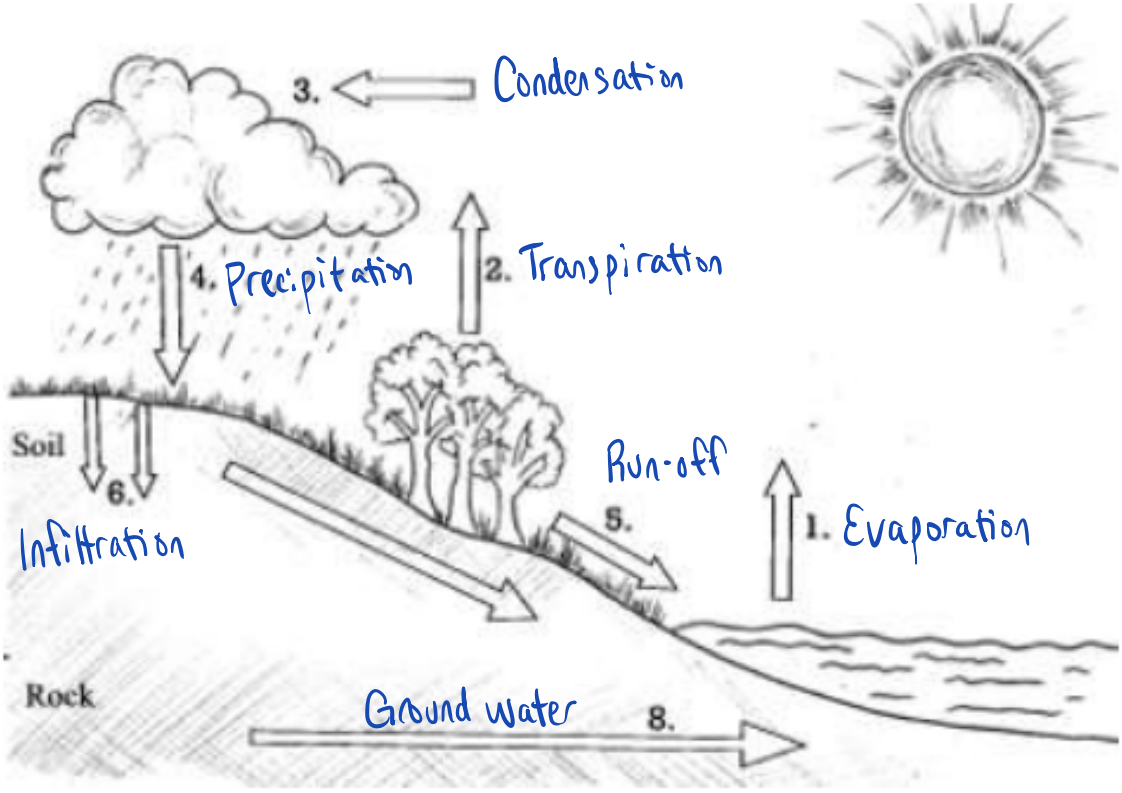
Non-renewable energy is energy from sources that will run out
ex. Fossil fuels (coal, oil, gasoline), Nuclear (nuclear fission reactions in nuclear power plants)

Earth Science

Matching: Match the descriptor with the BEST term

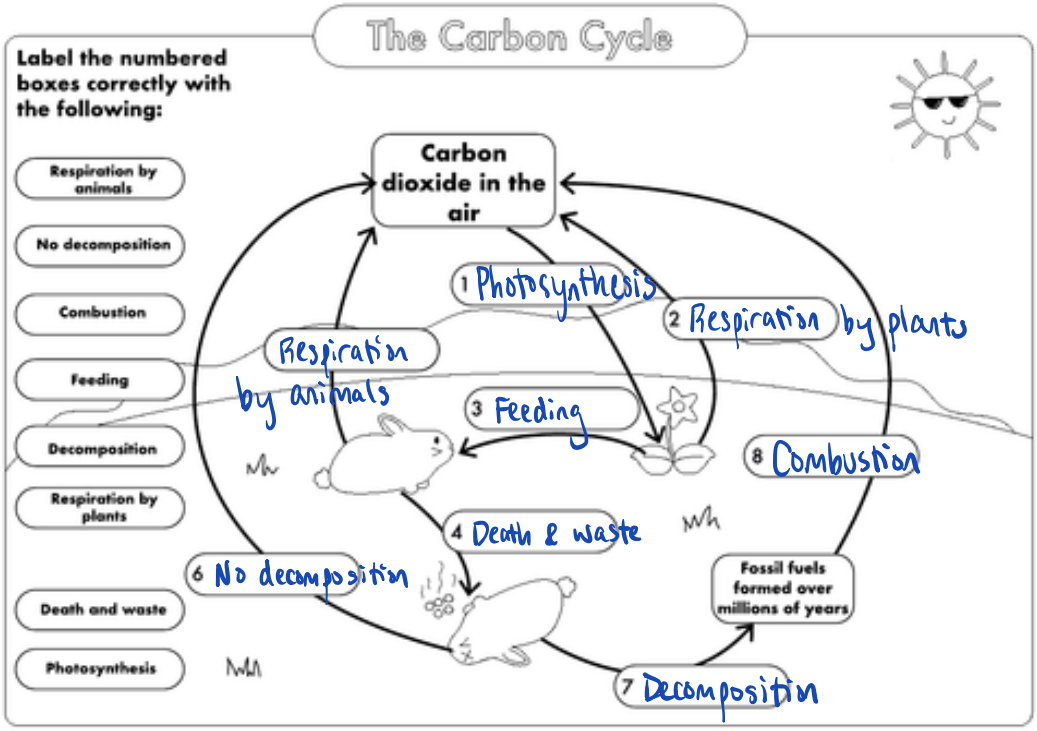
Definition	Term
H 1. Living things that break down dead organic material to get their energy G 2. A model that describes how food energy is passed from one living thing to another in an ecosystem. D 3. A model that shows the amount of energy available in each level of a food chain. A 4. Process that absorbs the outgoing solar energy in Earth's atmosphere E 5. Gases that absorb solar energy in Earth's atmosphere C 6. Factors that control how large a population can be in an environment F 7. The phenomenon that causes winds when warm air near the Earth's surface rises and eventually cools down while cool air sinks B 8. The phenomenon that makes things (like air) travelling around the Earth to appear to move in a curved fashion	a. Greenhouse Effect b. Coriolis effect c. Limiting Factors d. Energy pyramid e. Greenhouse gas f. Convection currents g. Food web h. Decomposer

Label the following **water cycle**:



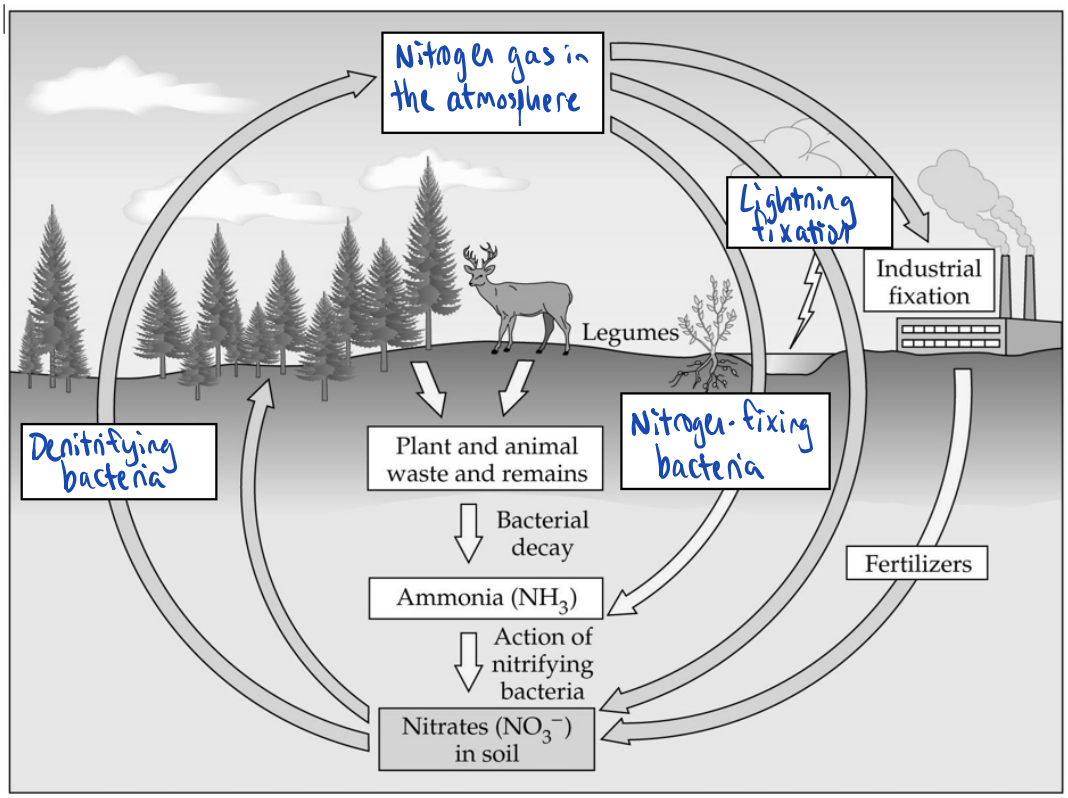
Word Bank
- Infiltration
- Run-off
- Transpiration
- Condensation
- Ground water
- Evaporation
- Precipitation

Label the following **carbon cycle**:



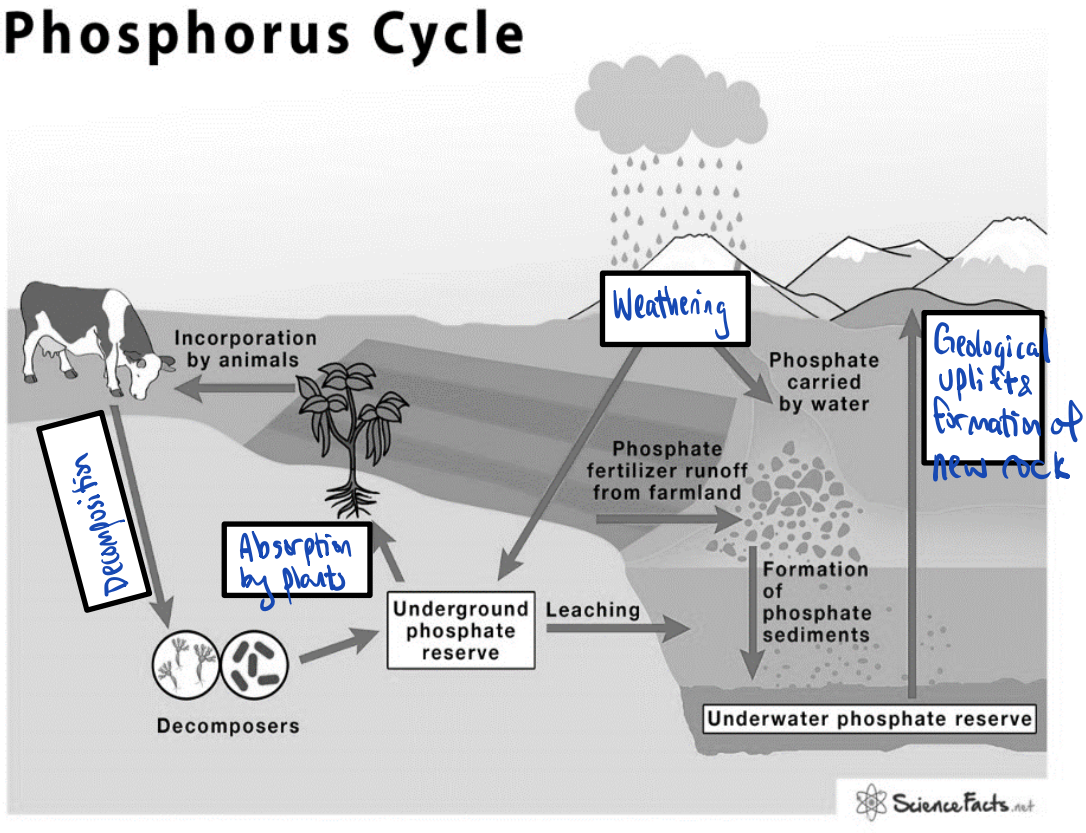
Word Bank
- Combustion
- Feeding
- Respiration by animals
- Photosynthesis
- Death & waste
- No decomposition
- Decomposition
- Respiration by plants

Label the following **nitrogen cycle**:



Word Bank
- Denitrifying bacteria - Nitrogen-fixing bacteria - Lightning fixation - Nitrogen gas in the atmosphere

Label the following **phosphorus cycle**:



Word Bank
- Decomposition - Absorption by plants - Geological uplift & formation of new rock - Weathering