

# General Cycle Questions

Directions: Answer each of the following questions by either filling in the blank or answering the short answer questions with COMPLETE SENTENCES.

1. A cycle shows the **AMOUNT** of certain elements and compounds (e.g. water, carbon, oxygen, nitrogen, phosphorus) in different forms in ecosystems.
2. Cycling maintains homeostasis (**BALANCE**) in the environment.
3. The **SUN** provides the heat energy required for the water cycle to continue.
4. **CARBON** and **OXYGEN** occurs in all living organisms in the forms of CO<sub>2</sub>, carbohydrates (sugars and starches), proteins and fats/lipids.
5. Molecules are passed around again and again within the biosphere in **NUTRIENT** cycles.
6. Water, **CARBON**, and Nitrogen also cycle between the atmosphere, environment, and organisms.  
**PHOSPHORUS** does not cycle through the atmosphere.
7. Ecologists discovered that trout were dying in a stream that ran through some farmland where nitrogen fertilizer was used on the crops. How might you explain what happened? Formulate a hypothesis in order to test your idea. **RUNOFF FROM FERTILIZERS INCREASED PLANT GROWTH IN WATER (ALGAL BLOOMS), WHICH SUFFICATED THE AQUATIC ENVIRONMENT.**

MY

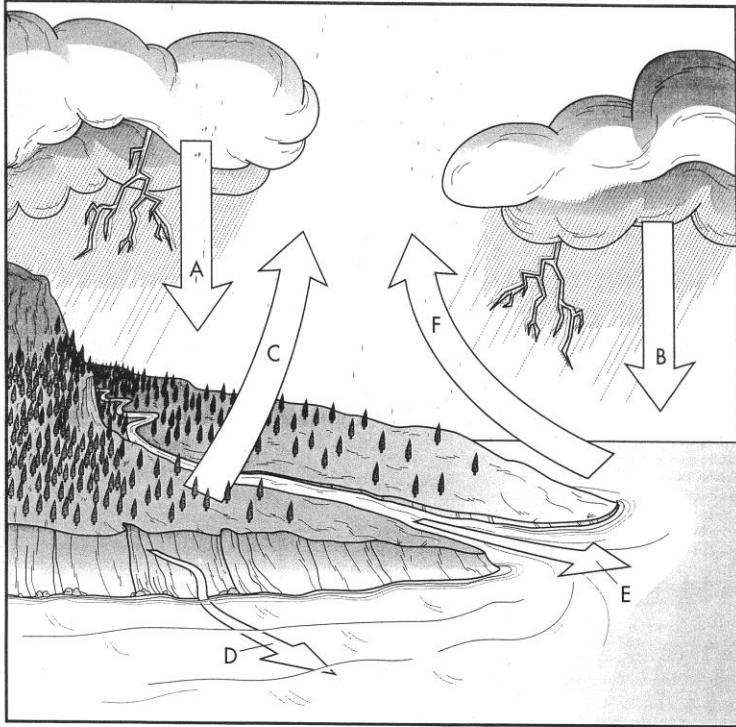
CYCLING

BOOK

Name:

Period:

# Water Cycle



Directions: Match each arrow with its description. Then color the arrow and the box next to the description the same color.

E  Run off from the Surface

B  Precipitation over the Ocean

F  Evaporation of the Ocean

D  Seepage from Ground

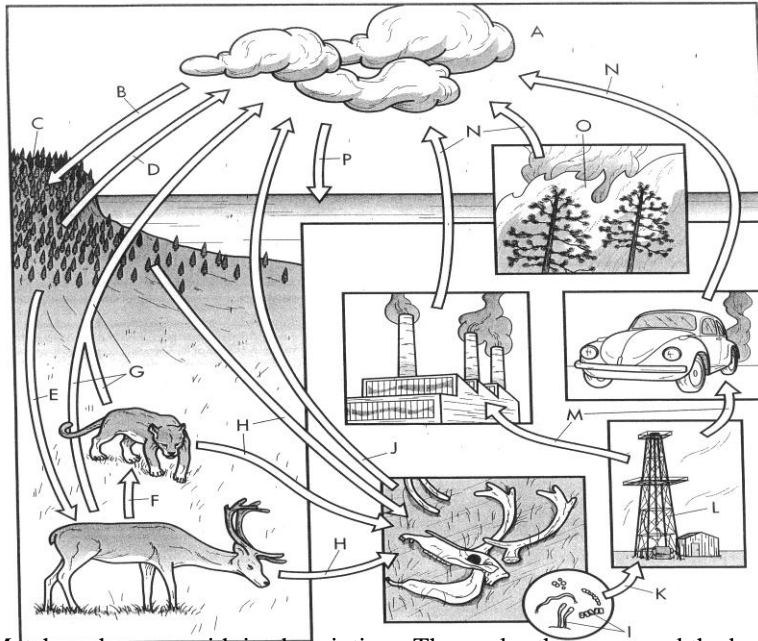
A  Precipitation over Land

C  Transpiration

Directions: Answer each of the following questions by either filling in the blank or answering the short answer questions with COMPLETE SENTENCES.

- Water molecules enter the atmosphere when they EVAPORATE from bodies of water.
- Water in the atmosphere cools and CONDENSES.
- When droplets become large enough they fall to the earth as PRECIPITATION.
- Much of the water on land runs into STREAMS and RIVERS, PONDS, ETC.
- Water on land surfaces ultimately enters the OCEAN.
- The process by which water changes from liquid form to an atmospheric gas is called EVAPORATION.
- During TRANSPIRATION, water enters the atmosphere by evaporating from the leaves of plants.
- Give examples of precipitation in the following forms: solid, liquid and gas. HAIL – SOILD, RAIN = LIQUID, FOG = GAS
- Why is water so important to life? ESSENTIAL FOR LIFE – NEED WATER TO HYDRATE.
- Explain as best you can what the following quote means: “We all live upstream”. EVERYTHING WE DO EFFECTS OTHERS – IF OUR WATER IS POLLUTED, THEN IT WILL DAMAGE ECOSYSTEM FURTHER DOWNSTREAM

# Carbon Cycle



Directions: Match each arrow with its description. Then color the arrow and the box next to the description the same color.

- |                          |                                 |                          |                                      |
|--------------------------|---------------------------------|--------------------------|--------------------------------------|
| <input type="checkbox"/> | <b>H</b> Decay                  | <input type="checkbox"/> | <b>M</b> Uses for Fossil Fuels       |
| <input type="checkbox"/> | <b>B</b> Photosynthesis         | <input type="checkbox"/> | <b>A</b> Atmosphere                  |
| <input type="checkbox"/> | <b>O</b> Forest Fire            | <input type="checkbox"/> | <b>I</b> Detritus Feeders            |
| <input type="checkbox"/> | <b>D</b> Respiration in Plants  | <input type="checkbox"/> | <b>J</b> Detritus Feeder Respiration |
| <input type="checkbox"/> | <b>N</b> Products of Combustion | <input type="checkbox"/> | <b>K</b> Conversion to Fossil Fuels  |
| <input type="checkbox"/> | <b>F</b> Animal Consumption     | <input type="checkbox"/> | <b>L</b> Fossil Fuel Processing      |
| <input type="checkbox"/> | <b>P</b> Exchange with Oceans   | <input type="checkbox"/> | <b>G</b> Animal Respiration          |
| <input type="checkbox"/> | <b>E</b> Plant Consumption      | <input type="checkbox"/> | <b>C</b> Forest                      |

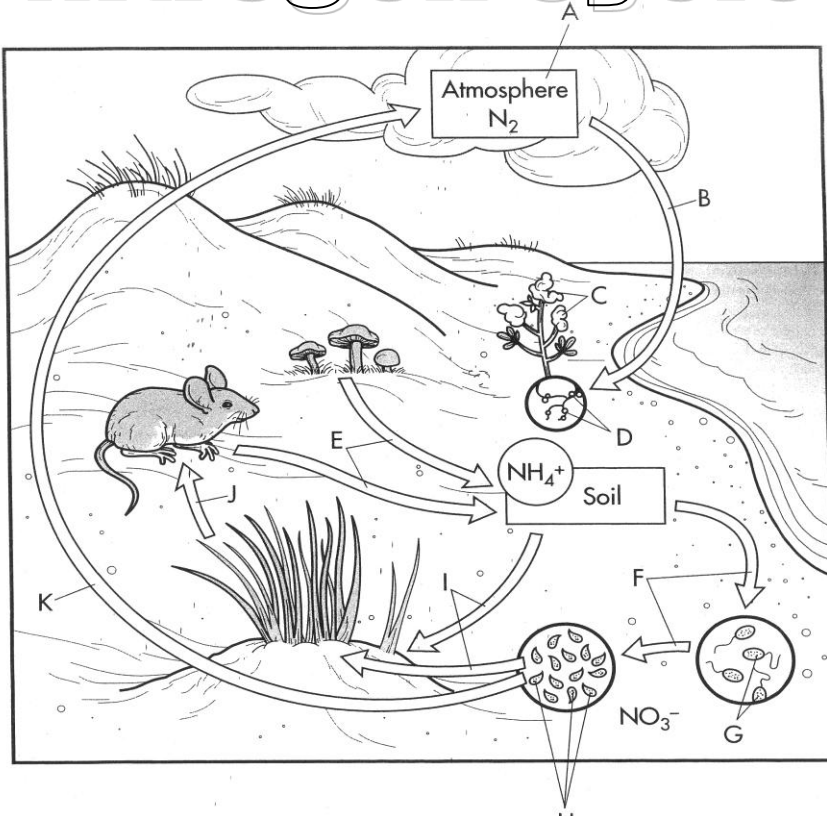
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Directions: Answer each of the following questions by either filling in the blank or answering the short answer questions with COMPLETE SENTENCES.

- Human activities such as **BURNING FOSSIL FUELS, RESPIRATION** cycle carbon through the carbon cycle.
- Biological processes such as **RESPIRATION & PHOTOSYNTHESIS** cycle carbon through the carbon cycle.
- Geochemical processes such as **VOLCANOES, CONVERSION TO FOSSIL FUELS** release carbon into the atmosphere.
- Through **BIOLOGICAL RESPIRATION** carbon dioxide is returned back to the atmosphere.
- Plant use **CARBON** to build organic molecules during **PHOTOSYNTHESIS**
- What are the main sources of carbon dioxide in the atmosphere? **RESPIRATION OF ANIMALS, BURNING OF FOSSIL FUELS**
- Every **ORGANISM** on Earth needs carbon either for structure, energy, or, as in the case of humans, for both.
- Carbon is found in forms as diverse as the gas carbon dioxide (CO<sub>2</sub>), and in solids like **LIMESTONE** (CaCO<sub>3</sub>), wood, plastic, diamonds, plants, and graphite.
- What are the sources of carbon in the ocean? **SHELLS, LIMESTONE, AQUATIC ORGANISMS**
- Describe the role of producers in the carbon cycle. **TAKE CARBON OUT OF ATMOSPHERE (photosynthesis)**

# Nitrogen Cycle

Directions: Answer each of the following questions by either filling in the blank or answering the short answer questions with COMPLETE SENTENCES.



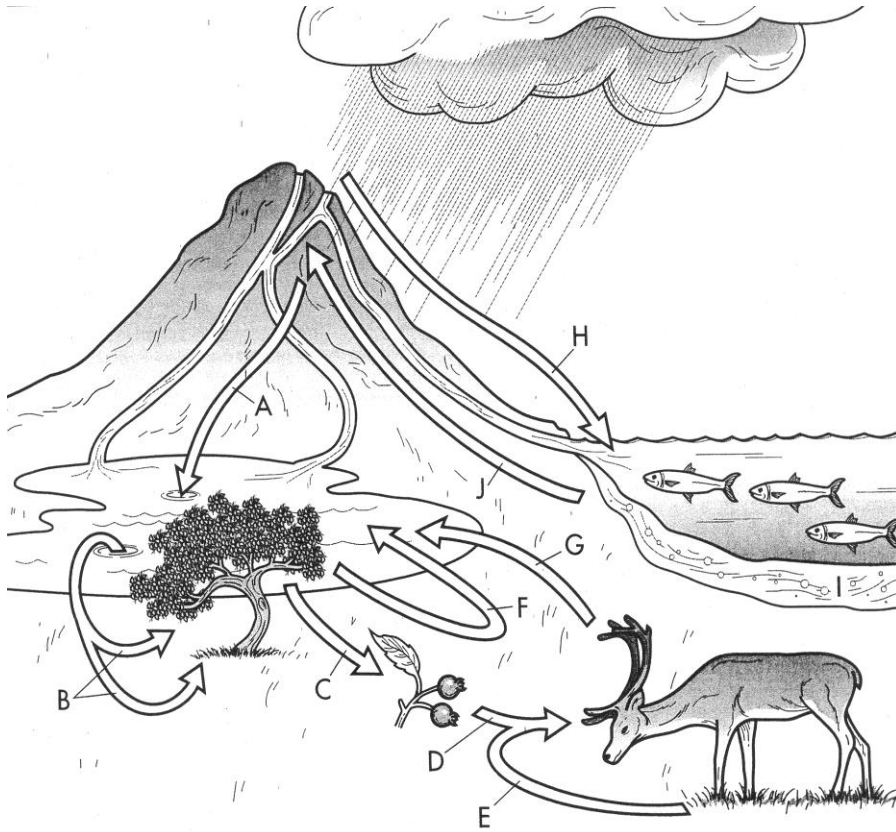
1. A chemical substance that an organisms requires to live is called a **NUTRIENT**.
2. The conversion of atmospheric nitrogen into a form used by plants is a process called **NITROGEN FIXATION**.
3. The conversion of nitrogen from the soil into nitrogen gas is called **DNITRIFICATION**.
4. In the nitrogen cycle, the bacteria that live on the roots of plants change **ATMOSPHERIC N (N<sup>2</sup>)** into **AMMONIUM (NH<sub>4</sub><sup>+</sup>)**.
5. The atmosphere is **78-80**% nitrogen gas.
6. Nitrogen fixing **BACTERIA** live in the **SOIL** or within **THE ROOTS** of plants.
7. Organisms must have Nitrogen to make **PROTEINS** and **AMINO ACIDS**.
8. What is the importance of nitrogen fixation in an ecosystem?  
**CHANGES ATMOSPHEREIC NITROGEN (N<sub>2</sub>) INTO A FORM WE CAN USE = AMMONIUM (NH<sub>4</sub><sup>+</sup>)**
9. How are bacteria important in the nitrogen cycle?  
**THEY DO THE CONVERTING INTO A USABLE FORM & BREAK DOWN DEAD ORGANISMS RELEASING N TO BE USED AGAIN.**

Directions: Match each arrow with its description. Then color the arrow and the box next to the description the same color.

- |                          |                                   |                          |                              |
|--------------------------|-----------------------------------|--------------------------|------------------------------|
| <input type="checkbox"/> | <b>K</b> Denitrification          | <input type="checkbox"/> | <b>E</b> Ammonification      |
| <input type="checkbox"/> | <b>B</b> Nitrogen Fixation        | <input type="checkbox"/> | <b>A</b> Atmosphere          |
| <input type="checkbox"/> | <b>J</b> Consumption by Animals   | <input type="checkbox"/> | <b>H</b> <i>Nitrobacter</i>  |
| <input type="checkbox"/> | <b>C</b> Legume Plant             | <input type="checkbox"/> | <b>G</b> <i>Nitrosomonas</i> |
| <input type="checkbox"/> | <b>I</b> Consumption by Plants    | <input type="checkbox"/> | <b>F</b> Nitrification       |
| <input type="checkbox"/> | <b>D</b> Nitrogen-fixing Bacteria |                          |                              |



# Phosphorus Cycle



Directions: Answer each of the following questions by either filling in the blank or answering the short answer questions with COMPLETE SENTENCES.

- Most of the phosphorus in the biosphere is stored in the **BONES AND TEETH OF ORGANISMS OR PLANTS, ROCKS & SOIL IN GEOSPHERE**
- Phosphate **INCREASES** the growth of plankton and plants.
- How does organic phosphate move through a food web? **FROM ORGANISM TO ENVIRONMENT AND BACK AGAIN. BREAKS OFF OF ROCKS (WEATHERING), PLANTS ABSORB IT & DECOMPOSERS PUT IT BACK INTO THE SOIL, THEN PLANTS USE IT (ABSORB THROUGH ROOTS) AND ANIMALS EAT PLANTS.**
- What is one way that the phosphorus cycle differs from the carbon and nitrogen cycles? **DOES NOT CYCLE UP INTO THE ATMOSPHERE**
- How is phosphorus important to living organisms? **BONES IN TEETH IN ANIMALS, INCREASES PLANT GROWTH**
- How do humans affect the nitrogen and phosphorus cycles? **USE FERTILIZERS ON CROPS, WHICH RUN OFF INTO THE RIVERS & PRODUCES ALGAL BLOOMS, WHICH THEN SUFFICATE THE AQUATIC ENVIRONMENT.**

Directions: Match each arrow with its description. Then color the arrow and the box next to the description the same color.

- |                          |                               |                          |  |
|--------------------------|-------------------------------|--------------------------|--|
| <input type="checkbox"/> | <b>E</b> Grazing              | <input type="checkbox"/> | <b>H</b> Runoff to Ocean               |
| <input type="checkbox"/> | <b>B</b> Absorption by Plants | <input type="checkbox"/> | <b>G</b> Animal Wastes                 |
| <input type="checkbox"/> | <b>D</b> Plant Consumption    | <input type="checkbox"/> | <b>A</b> Erosion from Rock             |
| <input type="checkbox"/> | <b>F</b> Plant Waste          | <input type="checkbox"/> | <b>I</b> Marine Sediment               |
| <input type="checkbox"/> | <b>J</b> Geologic Up thrust   | <input type="checkbox"/> | <b>C</b> Concentration in Plant Tissue |