Biology Summer Assignments

Welcome Mustangs!

The following summer assignments are to assist you in obtaining background information for topics we will be learning during 1st quarter, in Biology. Please have your **summer assignments completed by Wednesday, August 15th**. Your **1st Quiz will be on Friday, August 17th.**

Please follow the directions carefully, we expect that **each summer assignment will take approximately 1 hour** to complete.

Sincerely,

Your Biology Teachers

Setting Up Your Science Binder

- Obtain a 1” or larger 3-ring binder.
- Obtain 10 section dividers and label them as follows:
  - Bio Basics
  - Ecology
  - Cell Structure
  - Cell Transport
  - Cellular Energy
  - Cell Division
  - DNA
  - RNA
  - Genetics
  - Evolution

Ecology:
Biogeochemical Cycles & Energy Pyramids

Ecology Section Checklist:

- ❑ Please print the standards & learning scale for the Ecology Section to be used as the 1st page(s) in the Ecology Section of your notebook.

- ❑ Complete Assignment #1 on the 4 Biogeochemical Cycles. Please use the following link as a resource to better understand the cycles.

  Biogeochemical Cycling

  http://www.bozemanscience.com/biogeochemical-cycling

- ❑ Complete Assignment #2 on the Cycling of Energy. Please use the following link as a resource to better understand energy transfer in an ecosystem.

  Food Chains vs Food Webs

  https://www.youtube.com/watch?v=VfhgthqiGgY

Ecology Standards: Print this page!

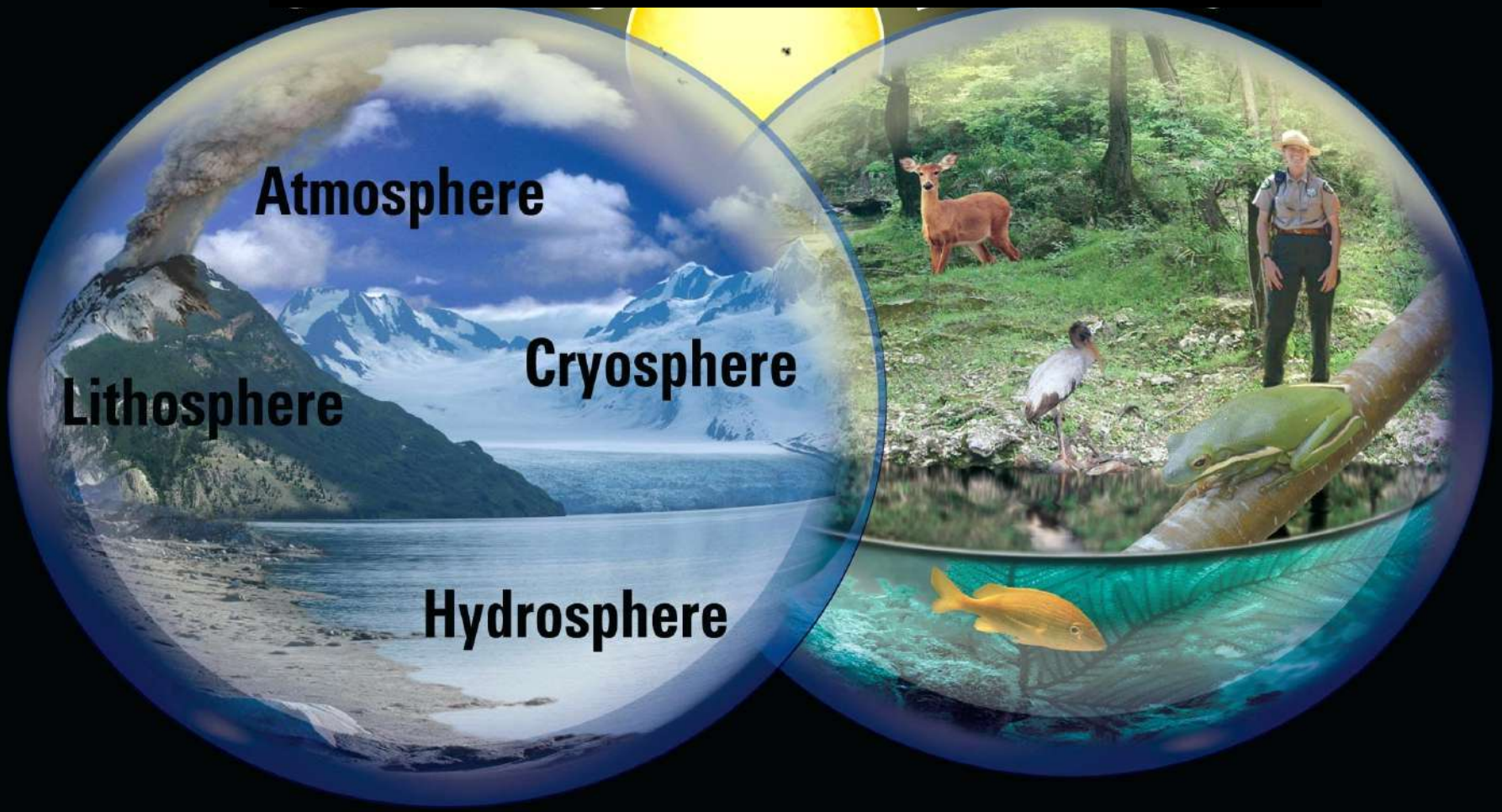
- SC.912.E.7.1 Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon (2)
- SC.912.L.17.2 Explain the distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity and temperature (3)
- SC.912.L.17.4 Describe changes in ecosystems resulting from seasonal variations, climate change & succession (2)
- SC.912.L.17.5 Analyze how population size is determined by births, deaths, immigration, emigration and limiting factors (biotic and abiotic) that determine carrying capacity (3)
- SC.912.L.17.8 Recognize the consequences of the losses of biodiversity due to catastrophic events, climate, changes, human activity, and the introduction of invasive, non-native species (3)
- SC.912.L.17.9 Use a food web to identify & distinguish producers, consumers and decomposers. Explain the pathway of energy transfer through trophic levels & the reduction of available energy at successive trophic levels (2)
- SC.912.L.17.11 Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife and forests (3)
- SC.912.L.17.13 Discuss the need for adequate monitoring of environmental parameters when making policy decisions. (3)
- SC.912.L.17.16 Discuss large-scale environmental impacts of human activity i.e. run-off, greenhouse gases, oil & waste spills, ozone depletion and surface & groundwater pollution (3)
- SC.912.L.17.20 Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability (3)

Ecology Learning Scale: Print this page!

Score	Learning Progression
4	I am able to: ○ Apply concepts from previous levels in a laboratory setting, using the scientific process. ○ Expand on the ideas presented in the previous level by relating the concepts to real world events and situations.
3 (Target)	I am able to: A. Explain the flow of matter through the water, carbon, nitrogen, and phosphorus cycles. B. Formulate hypotheses as to how chemistry, geography, light, depth, salinity, and temperature affect the distribution of aquatic life. C. Analyze and discuss the impact that seasonal changes and succession may have on an ecosystem. D. Predict the effect of limiting factors on carrying capacity, and the future birth rate, death rate, emigration, immigration patterns within a population. E. Explain the consequences of loss of biodiversity resulting from natural as well as manmade activities. F. Explain how energy is transferred through trophic levels in an ecosystem, and why available energy is reduced at every level. G. Explain the costs and benefits of renewable and nonrenewable resources, and the costs and benefits to properly monitor and sustain these resources. H. Explain how human activities can impact an environmental system. Explain the relationship between global warming and global climate change.
2	I am able to: A. Trace the movement of matter through the water, carbon, nitrogen, and phosphorus cycles. B. Identify the effects of depth, salinity, and temperature on life within aquatic ecosystems. C. Compare and contrast primary and secondary succession. D. Trace the relationship between birth and death rates, and emigration and immigration on a population size over time. E. Identify the loss of biodiversity in an ecosystem resulting from the introduction of invasive, non-native species. F. Trace the transfer of energy through the feeding interactions in a food web. G. Differentiate between renewable and nonrenewable resources. H. Identify adequate monitoring parameters for environmental systems. Identify potential effects of global warming and global climate change.
1	I am able to: A. Identify the water, carbon, nitrogen, and phosphorus cycles and their components. B. Define depth, photic, aphotic, salinity, benthic, pelagic, and temperature in the context of aquatic ecosystems. C. Identify conditions that lead to primary and secondary succession. D. Define birth rate, death rate, immigration, emigration, limiting factor, and carrying capacity. E. Define biodiversity, invasive species, extinction, and pollution. F. Trace the transfer of energy through a food chain. G. Define renewable and nonrenewable resource. H. Define sustainability, global warming, and global climate change.

BioGeoChemical Cycles

Assignment #1

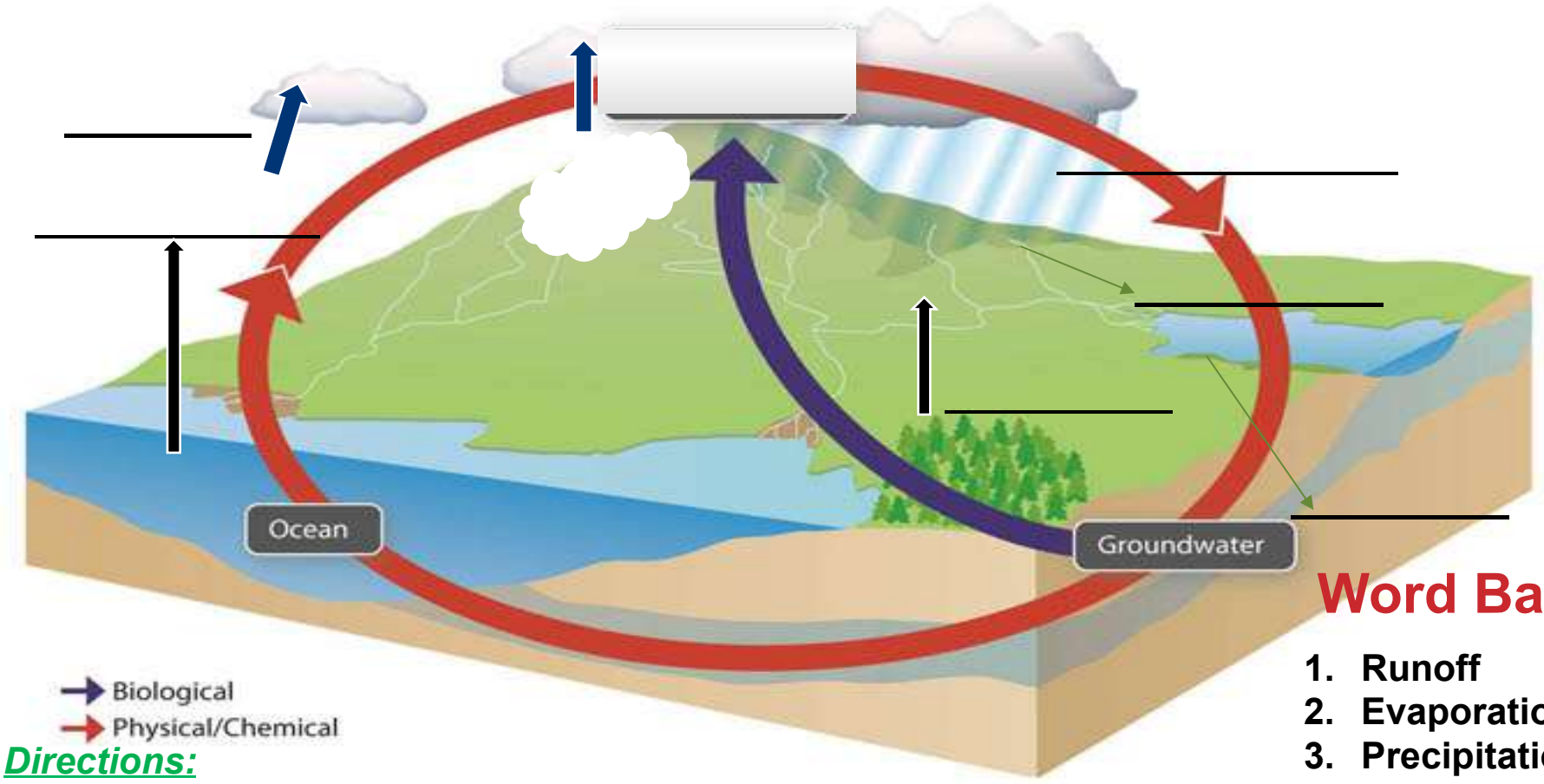


SC.912.E.7.1 Analyze the movement of matter and energy through the different biogeochemical cycles, including water, carbon, nitrogen & phosphorus (2)

The Water Cycle

Assignment #1 - put in Ecology section of notebook

Water cycles between the oceans, the atmosphere and land called the hydrologic cycle. Sometimes it cycles outside living organisms and sometimes inside them.



Word Bank

1. Runoff
2. Evaporation
3. Precipitation
4. Transpiration
5. Condensation
6. Sublimation
7. Percolation

Directions:

1. **Draw the water cycle in your notebook.**
2. **Define each term in your notebook.**
3. **Label the parts of the water cycle using the word bank provided.**

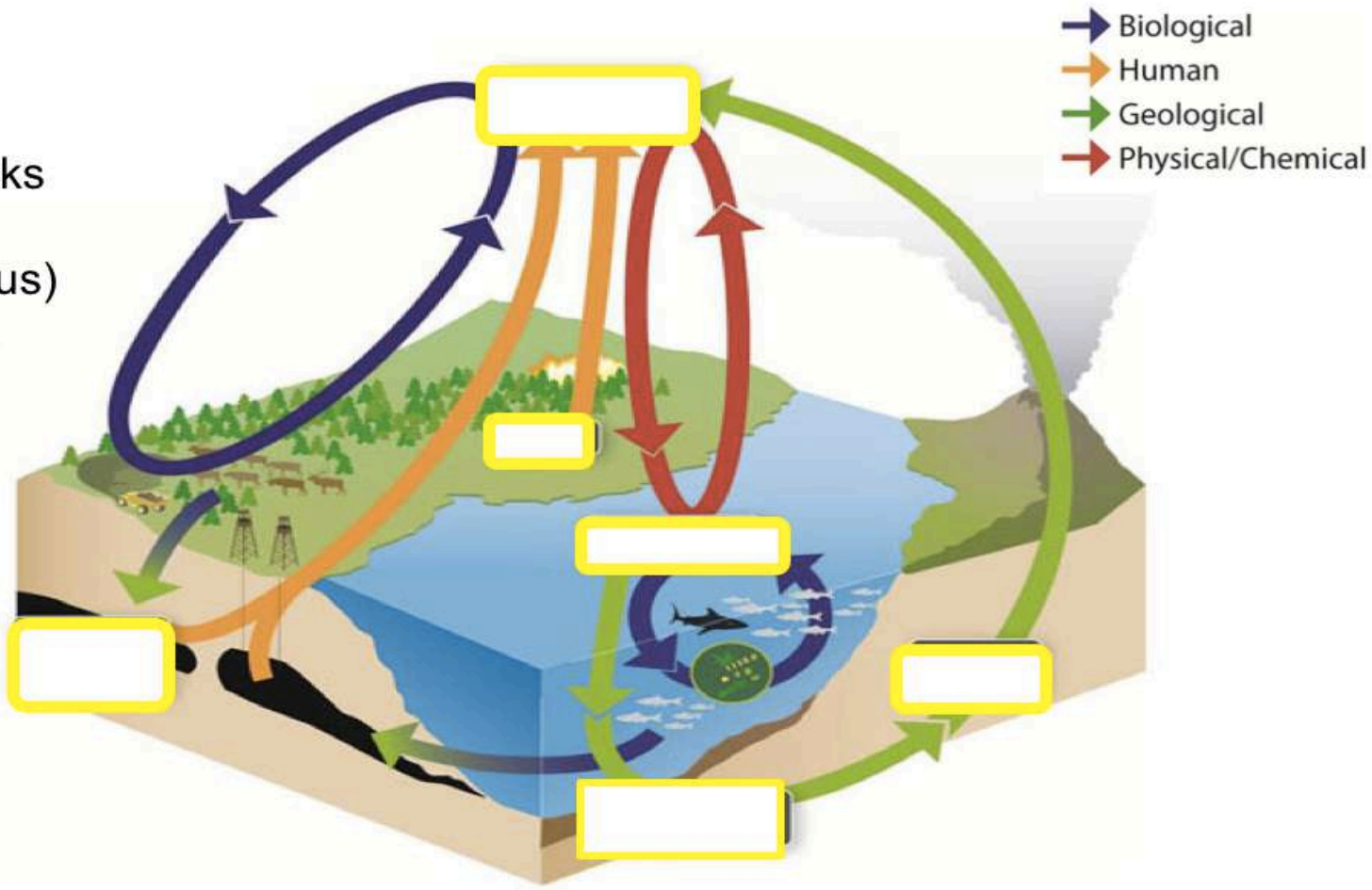
Assignment #1 - put in Ecology section of notebook

Carbon Cycle

Carbon is a major component of all organic compounds, including carbohydrates, lipids, proteins, and nucleic acids. In fact, carbon is such a key ingredient of living tissue and ecosystems that life on Earth is often described as carbon-based life or organic.

Word Bank

1. Atmospheric Carbon
2. Carbonate Rocks
3. Carbon Marine Sediments(Detritus)
4. Dissolved CO_2
5. Forests
6. Fossil Fuels



Directions:

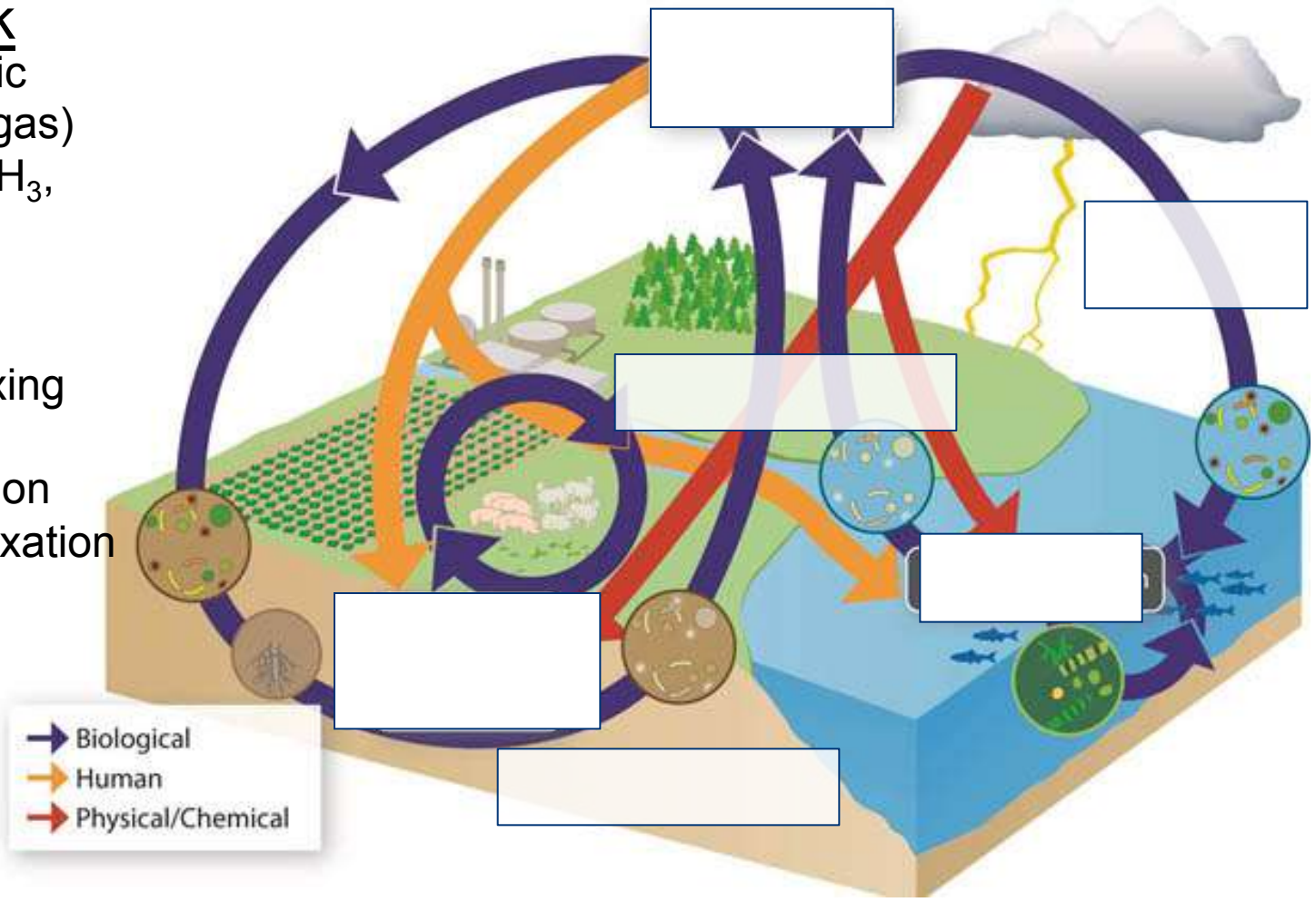
1. Draw and color code the Carbon Cycle in your Notebook.
2. Define the terms in the word bank in your Notebook.
3. Label the terms on your diagram in your Notebbok.

Nitrogen Cycle

All organisms require nitrogen to make amino acids, which combine to form proteins. They also need nitrogen to make nucleotides, which combine to form DNA and RNA.

Word Bank

1. Atmospheric Nitrogen (N_2 gas)
2. Nitrates (NH_3, NO_2, NO_3)
3. Dissolved Nitrogen
4. Nitrogen fixing bacteria
5. Denitrification
6. Nitrogen Fixation



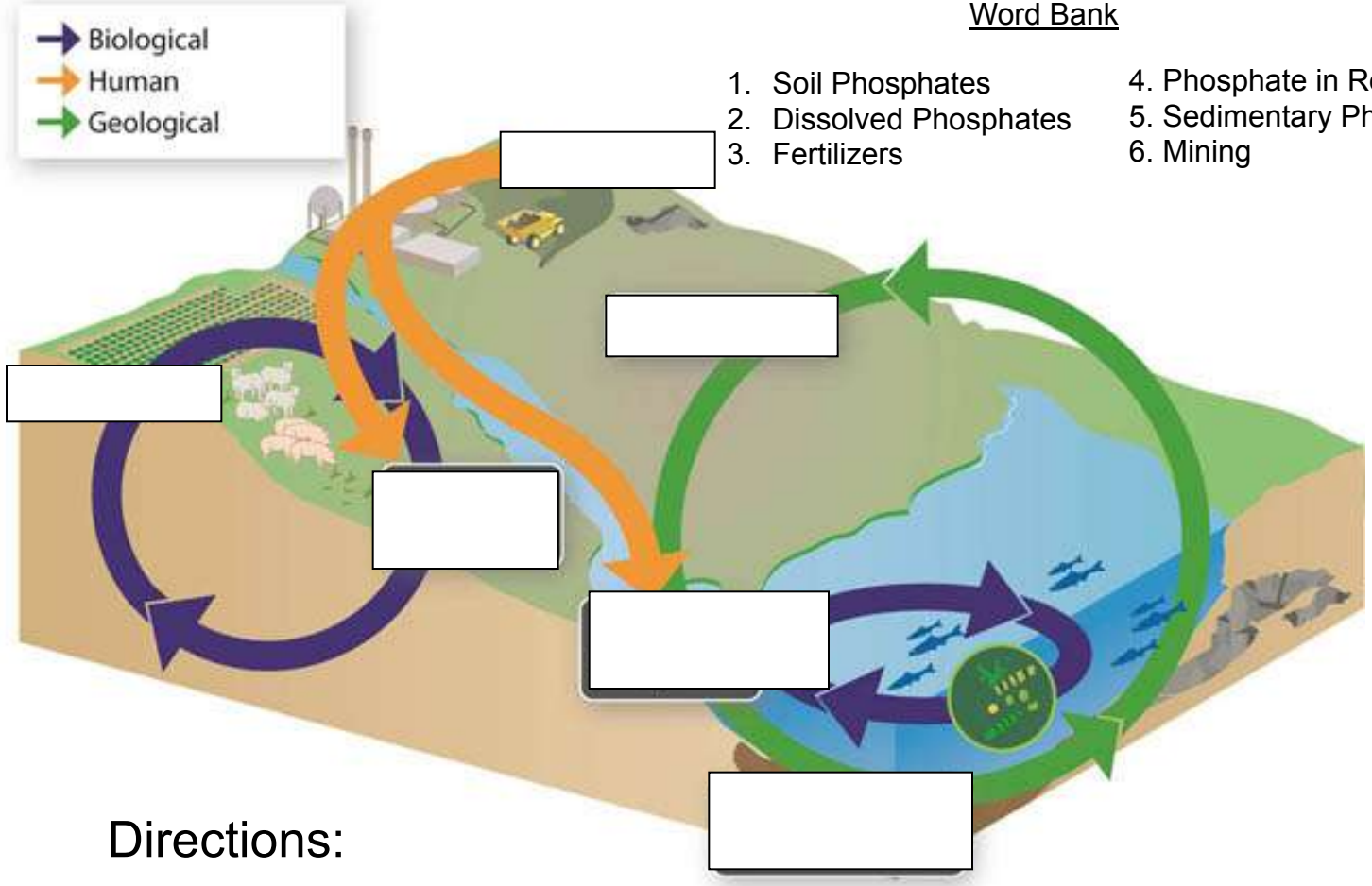
Directions:

1. Draw & Color Code the Nitrogen Cycle in your notebook.
2. Define the terms in the word bank in your notebook.
3. Use the terms in the word bank to label the cycle properly.

Nitro

Phosphorus Cycle

Phosphorus is essential to life because it is part of molecules such as DNA and RNA. Unlike carbon, oxygen, and nitrogen, phosphorus does not cycle through the atmosphere. In nature, inorganic (non-living) phosphate is released as rocks and sediments wear down remaining on land in the form of phosphate rock and soil minerals, and some is found in fresh and salt water as dissolved phosphate in sediments.



Word Bank

1. Soil Phosphates
2. Dissolved Phosphates
3. Fertilizers
4. Phosphate in Rocks
5. Sedimentary Phosphates (Detritus)
6. Mining

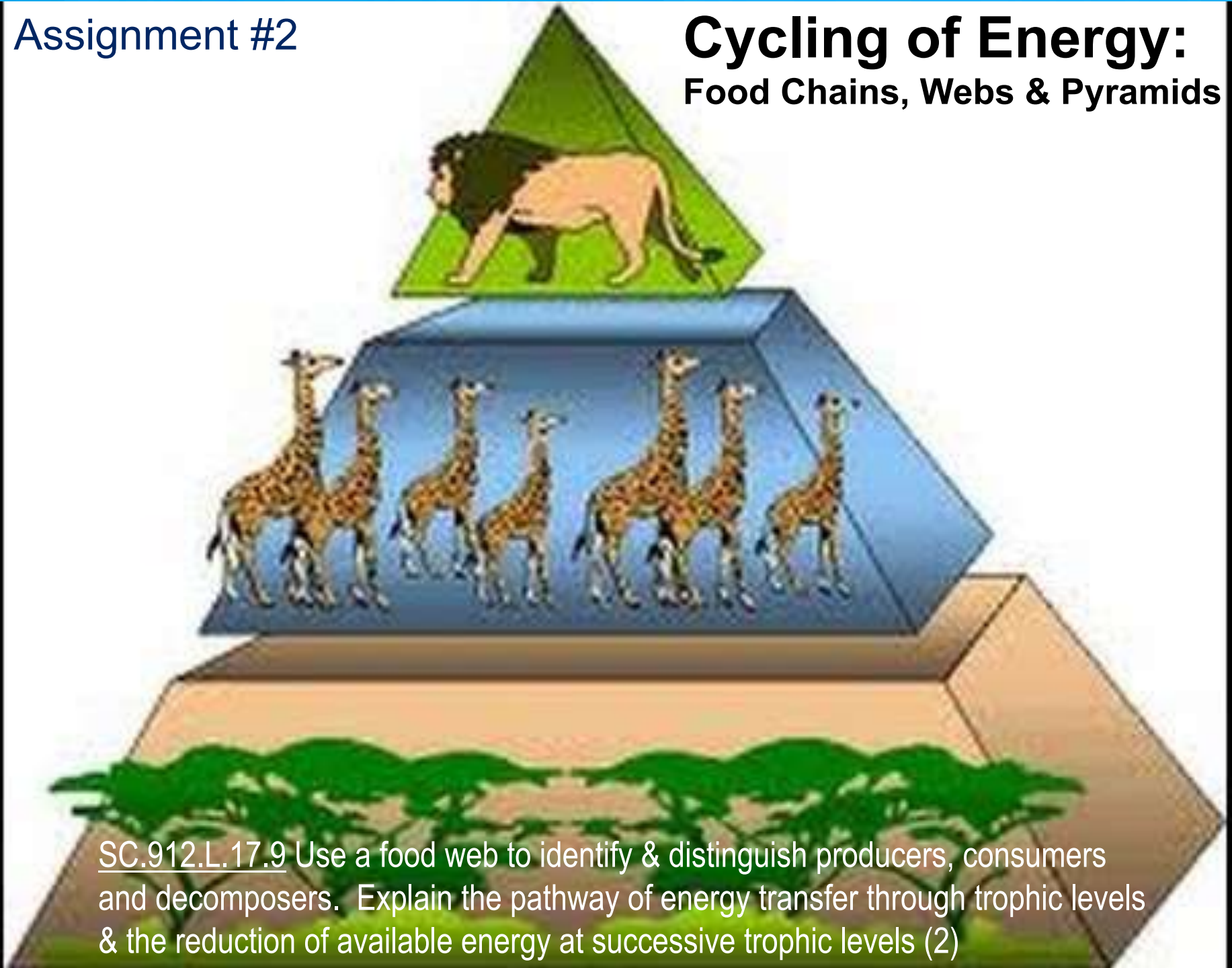
Directions:

1. Draw and color the phosphorous cycle in your notebook.
2. Define the terms in the word bank in your notebook.
3. Use the terms in the word bank and label the cycle properly.

Assignment #2

Cycling of Energy:

Food Chains, Webs & Pyramids



SC.912.L.17.9 Use a food web to identify & distinguish producers, consumers and decomposers. Explain the pathway of energy transfer through trophic levels & the reduction of available energy at successive trophic levels (2)

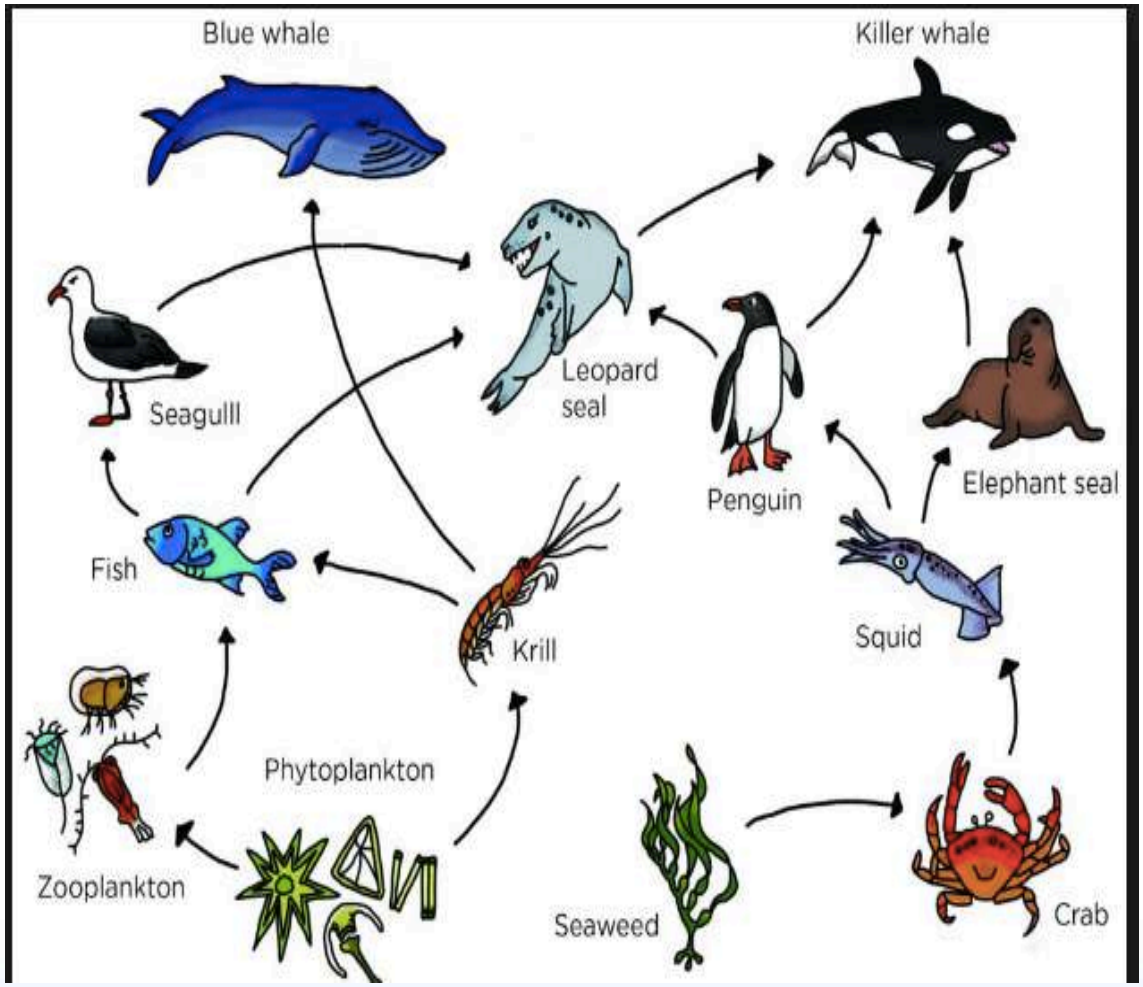
Food Chains, Webs & Pyramids Vocab

Write & define the following terms in your notebook:

- Food Chain
- Food Web
- Food Pyramid
- Primary Producers
- Primary Consumers
- Secondary Consumers
- Tertiary Consumers
- Quaternary Consumers

- Detritivore
- Decomposer
- Scavenger
- Producer
- Consumer
- Herbivore
- Carnivore
- Omnivore
- Apex Predator

Marine Food Web



- Look at the Marine Food Web provided.
- Cut and paste all the organisms into a Trophic Level Pyramid on notebook paper.
- Label each tropic level properly.
- Label each organism with any terms, from the previous slide, that apply.
- What trends do you notice within the pyramid?

Make your own food pyramid

- In your notebook, build a food pyramid for your biome.
- Choose one biome (ex. Grasslands, Savannah, Desert, Tundra, Deciduous Forest, Tropical Rain Forest or Tiaga)
- Identify and include at least 10 organisms from a variety of trophic levels within your biome.
- Label each trophic level within your pyramid.
- Label each organism with any terms you defined in your notebook (ex. Human = omnivore, apex predator &
- Identify any trends you notice within your pyramid.