APES/Cycles Assignment/Ch. 5

Once you are in your assigned group and have been given a cycle to tackle, do the following:

1. Choose a reference that adequately represents your cycle.
2. List the reservoirs (storage compartments) and pathways (transportation routes) for your cycle. Make sure everyone in the group agrees and all bases have been covered. Use both the pictures and the text information to guide you. (cite your reference(s) on your presentation)
3. Sketch a rough draft of the cycle’s pictoral representation.
4. Transfer the sketch to the giant post-it note. Color it in and make it pretty. Make sure to label all significant items and title with the cycle name.
5. Using two blank sheets of paper, list the primary reservoirs and pathways and affix to the bottom of the poster. Put a \*by the primary reservoir.
6. Prepare a short, sweet, accurate verbal presentation of your cycle (write it out so it won’t sound like ramble) and have one of your group members present to class. Another member can trace the cycle as the presentation is being given. (The other class will be doing the same thing, so make yours better than theirs!) Be sure to mention if your cycle is generally short or long.
7. All group members should participate.

Cycles:

The Hydrologic (Water) Cycle

The Carbon Cycle

The Nitrogen Cycle

The Phosphorous Cycle

The Sulfur Cycle

The Rock Cycle

The Carbon-Silicate Cycle

APES/Ch. 5/Cycle Notes (source: AP Bio Book, Raven & Berg, Botkin & Keller)

**The Hydrologic (Water) Cycle** (controls decomposition rates)

|  |  |
| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| ocean | precipitation |
| glaciers | evaporation |
| polar ice caps | condensation |
| lakes | percolation (infiltration) |
| rivers | runoff |
| groundwater | transpiration |
| atmosphere |  |
|  |  |
|  |  |

**The Carbon Cycle** (present in organic molecules essential to all organisms)

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| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| Fossil fuels | Combustion of fossil fuels |
| Soil | Photosynthesis (in) (plants and phytoplankton) |
| Sediment (aquatic) | Respiration (out) |
| Ocan | Volcanic eruptions |
| Plants | decomposition |
| Animals |  |
| Atmosphere |  |
| Rocks (limestone) |  |
| detritus |  |
|  |  |
|  |  |

**The Nitrogen Cycle** (component of amino acids, proteins, and nucleic acids/often limiting plant nutrient)

Plants and Algae: use NH4+ and NO3-

Bacteria: NH4+, NO3-, NO2-

Animals: store in amino acids and proteins

|  |  |
| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| \*atmosphere | Nitrogen fixatioin |
| soils | Nitrification |
| sediments of lakes, rivers, and oceans | Ammonification |
| dissolved in surface water | Assimilatioin |
| dissolved in groundwater | denitrification |
| biomass of living organisms |  |
| nitrogen fertilizer |  |
| blowing dust |  |
| bacteria |  |
|  |  |
|  |  |

**The Phosphorous Cycle** (nucleic acids, phospholipids, ATP (E storage) plus find in bones and teeth)

Plants use: PO43- (absorb it and use to synthesize organic compounds)

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| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| sedimentary rocks (marine sediment) | weathering of rock |
| soils | Llaching of groundwater & surface water |
| ocean (dissolved in) | through food web (consumers) |
| organisms | decomposition of biomass |
| guano | excretion by consumers |
|  | precipitation (aids weaterhing process) |
|  | geologic uplift |
|  | runoff |
|  | plant uptake |
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**The Sulfur Cycle** (tiny fraction in living organisms, but is essential to proteins)

Cycle is driven by bacteria.

Plant roots: absorb SO42- (plant protein, DSM (CH3SCH3) released by marine algae)

DSM helps condense water droplets in clouds. It the atmosphere, it is converted to SO42- and deposited into oceans

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| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| soil (metallic sulfides) | wet depositioin |
| rock (sedimentary) | dry deposition |
| atmosphere | combustioin |
| animals and plants | decomposition |
| ocean | weathering |
| detritus | erosion |
|  | runoff |
|  | sea spray |
|  | forest fires |
|  | dust storms |
|  | volcanoes (H2S, SOx) |

**Rock Cycle**

|  |  |
| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| igneous rocks | deposition |
| metamorphic rocks | lithification |
| sedimentary rocks | weathering |
| sediment | erosion |
| volcanoes | melting |
|  | metamorphism |
|  | freezing |
|  | techtonic uplift |
|  |  |
|  |  |

**Carbon-Silicate Cycle**

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| --- | --- |
| ***Reservoirs*** | ***Pathways*** |
| Atmosphere | Precipitation (H2CO3) |
| Carbonate-rich sediment | Techtonic cycle (delivers CO32- sediment to subduction zone |
| Marine organisms (Ca2+ and HCO3- used in shells) | Volcanic eruptions |
| Magma (CO2) |  |
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