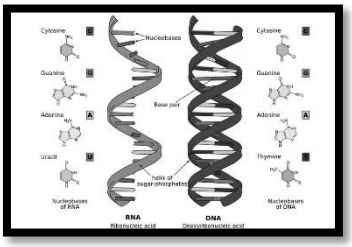
CYCLING OF MATTER

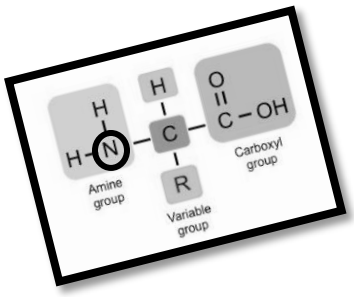
Nitrogen & Phosphorus cycles

Name: _____ Date: _____ Block: _____

Nitrogen
7
N
14.007

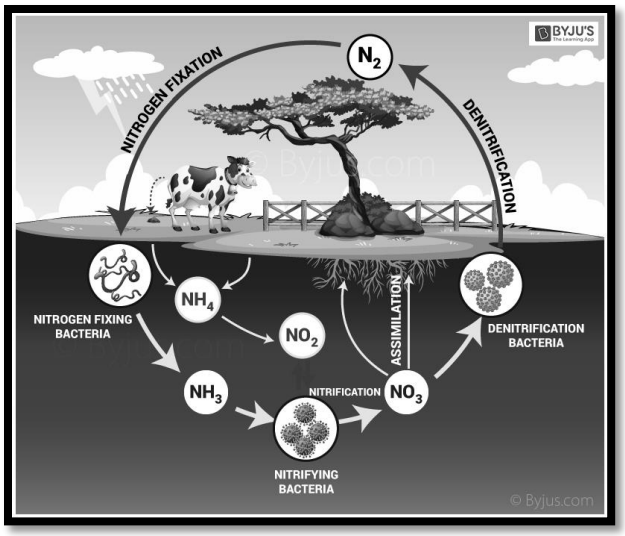
Nitrogen's Use in Organisms:





1. All organisms require what to make amino acids? _____
2. Amino acids are the basic building blocks of?
   a. Nucleic acids b. lipids c. proteins d. carbohydrates
3. Amino acids and Nucleic acids combine to form what? _____ & _____

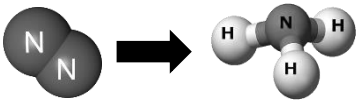
The Nitrogen cycle:



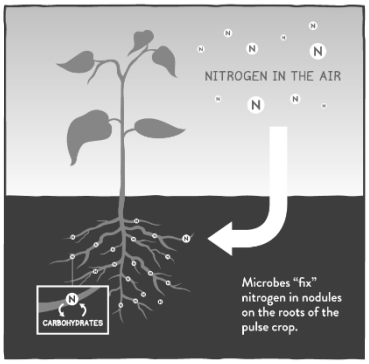
4. _____ (N_2) makes up how much of the Earth's atmosphere? _____%
5. Where are most of these nitrogen-containing substances found?

   - **Ammonia** (NH_3)
   - **Nitrate ions** (NO_3-)
   - **Nitrite ions** (NO_2-)

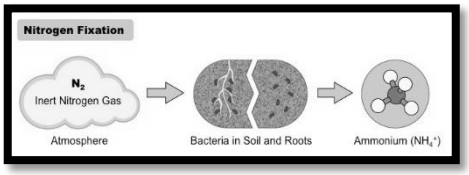
6. Where does dissolved nitrogen also exist? _____.
7. Though nitrogen is most abundant in the atmosphere, only certain what can use it directly? _____
8. What is the process called when bacteria convert nitrogen gas (N_2) into **ammonia**?



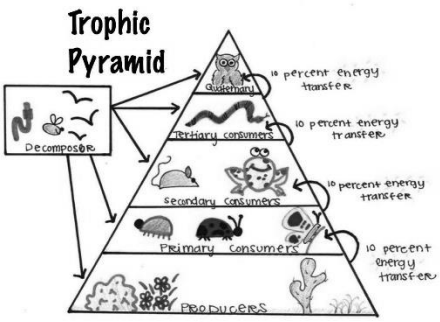
9. These nitrogen-fixing bacteria live in the _____ and the _____ _____ of certain plants, such as pea and peanut plants.
10. Other bacteria convert what into ***nitrates & nitrites?***



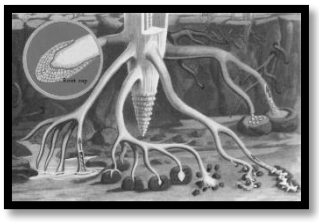
11. Once these forms of nitrogen become available, **primary PRODUCERS** make them into _____ _____ and nucleic acids.



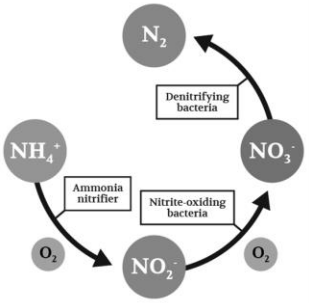
- **CONSUMERS** eat producers and reuse the nitrogen to make their own nitrogen-containing compounds.



- **DECOMPOSERS** release nitrogen from waste and dead organisms as ***ammonia, nitrates, and nitrites*** that **producers** may take up again.

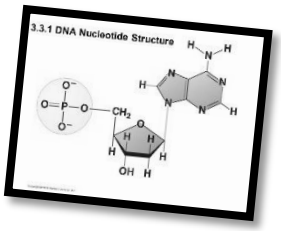


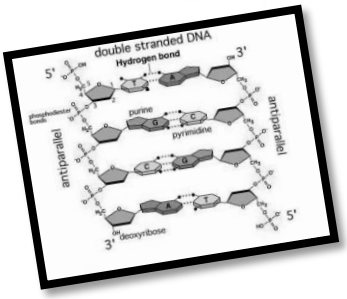
12. Some bacteria obtain energy by converting what into nitrogen gas? This then is released into the atmosphere? _____
13. What is this process called? _____
14. This is what happens when a small amount of nitrogen gas in converted into usable forms such as: _____
15. How do humans add nitrogen to the biosphere?
16. How is excess fertilizer often carried into surface water or groundwater?



Reaction route of conventional nitrification and denitrification

Phosphorus in Organisms:

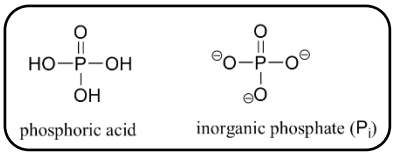




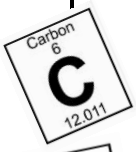
17. _____ is essential to living organisms as it is a vital molecule to what? _____ & _____
- *Though it is **NOT*** abundant in the atmosphere.

18. Unlike **carbon. oxygen. and nitrogen** phosphorus remains mainly where, and not in the atmosphere?

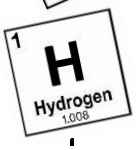
Phosphorus in the Land:



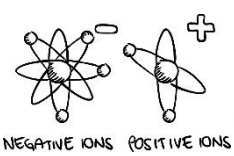
Note:

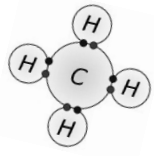


- ✓ Organic means containing carbon & hydrogen.



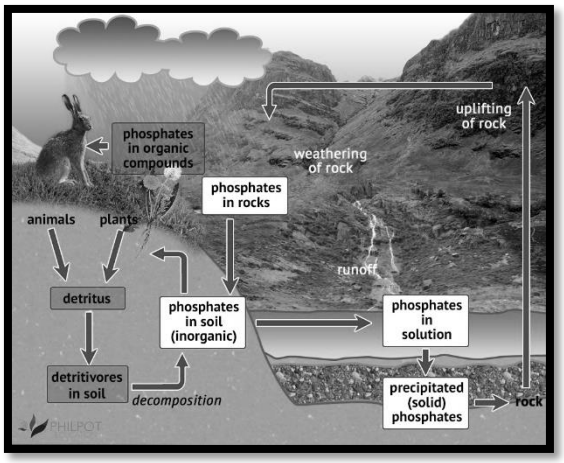
- ✓ Has covalent bonds
- ✓ Does NOT include ions.





19. How does phosphorus in the land stay as? _____
20. In what things, or places can **inorganic phosphate be** found?
21. Rocks & sediments gradually wear down over time and what is released? _____
22. Some phosphate stays on land and cycles between what?
23. Plants bind phosphate into _____ compounds when they absorb it from ***soil and water.***

- Some phosphate moves through **food webs** as some move and dissolves in **rivers and streams**.
- This phosphate may end up in the ocean, where marine organisms process into biological compounds.



Nutrient Limitation(s):

24. What is it called when a single **ESSENTIAL** nutrient is in short supply, and the primary productivity will be limited?

_____ _____

Answer the following questions <u>in your own words</u>:

1. If ample sunlight and water are available, the primary productivity of an ecosystem may be limited by the availability of nutrients right? **EXPLAIN YOUR ANSWER.**

2. How would land and marine ecosystems be affected with/without certain nutrients? **EXPLAIN YOUR ANSWER.**