

Matter in Ecosystems

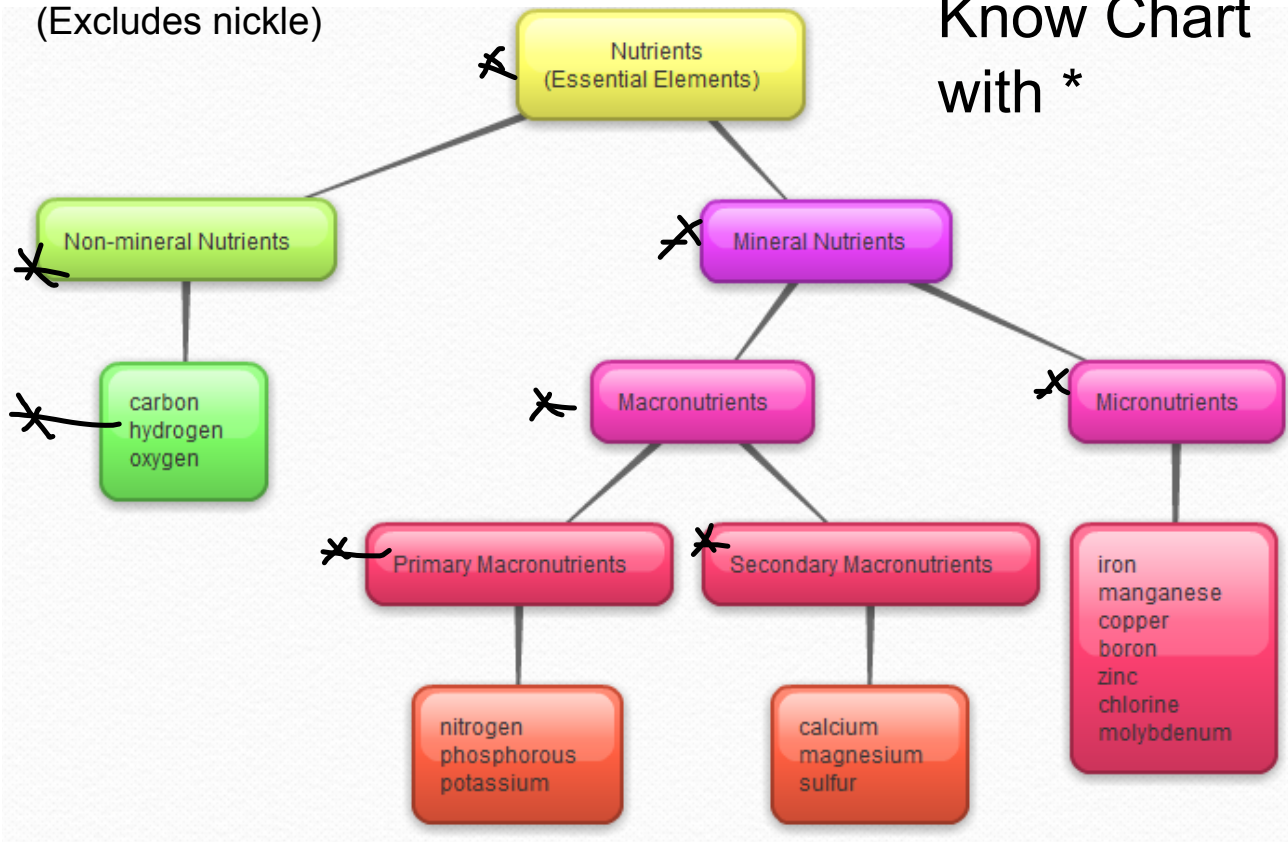
An ecosystem needs more than energy to function. It also needs matter. Matter is used by organisms in ecosystems for life processes. Most ecosystems need over 20 elements. Just the plants in most ecosystems need 16 elements. **These essential elements are called nutrients.**

energy
→

matter
↻

*Shows 16 elements which most plants need.
(Excludes nickle)

Know Chart with *



<https://bubbl.us/>

Essential and Beneficial Elements in Higher Plants																					
H																	He				
Li	Be															B	C	N	O	F	Ne
Na	Mg															Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
Fr	Ra	Lr	Rf	Db	Sg	Bh	Hs	Mt													
		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb						
		Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No						

NOTES - Nutrients and Cycles.pdf



Nutrients - Definitions

if you know chart you don't need this

non-mineral nutrients

✕ nutrients which enter an ecosystem
in the form of water and carbon dioxide
- oxygen, carbon, hydrogen
(building blocks of life)

mineral nutrients

✕ nutrients which enter an ecosystem from bedrock

macronutrients

required in greater amounts than micronutrients

primary macronutrients

iron - needed to make hemoglobin molecules in red-blooded animals

secondary macronutrients

magnesium - one of the atoms in a chlorophyll molecule

micronutrient

needed in relatively large amounts for plant growth (found in commercial fertilizers)
-nitrogen, phosphorus and potassium

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Nutrient Cycles

* Remember: Energy flows through an ecosystem in ONE direction
 Nutrients are recycled through ecosystems. *ON exam*

Producers get their nutrients from the soil, water and air.

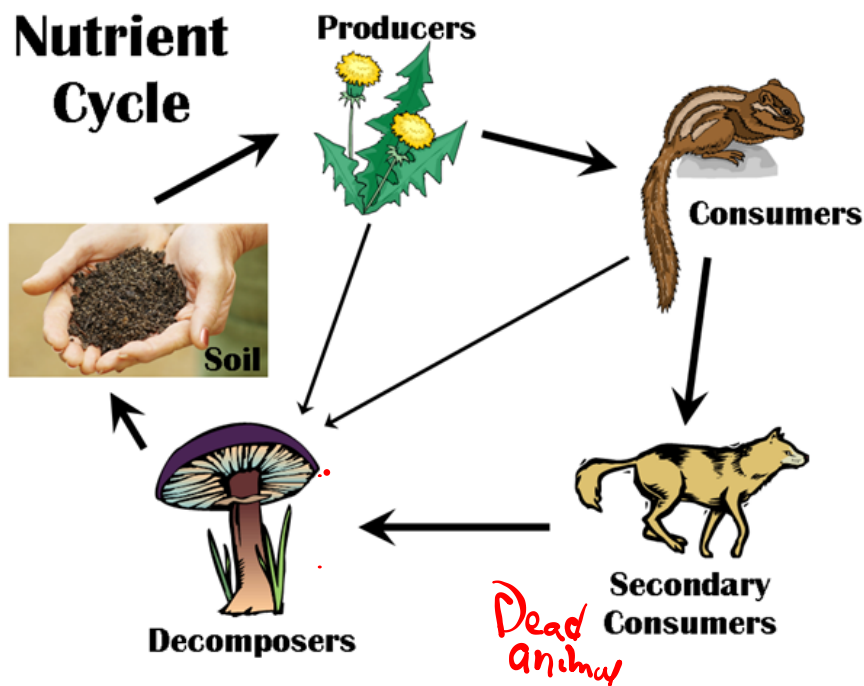
Herbivores get nutrients when they eat producers.

Carnivores get nutrients when they eat herbivores.

Decomposers break down animal wastes and dead organisms.

The actions of decomposers release nutrients back into the soil, water and air so producers can use them again.

* Consumers feed on living or once living organisms as a source of energy and nutrients



(Water and air not shown in this diagram.)

Cycles to be studied:

1. water cycle
2. carbon cycle
3. nitrogen cycle
4. phosphorus cycle

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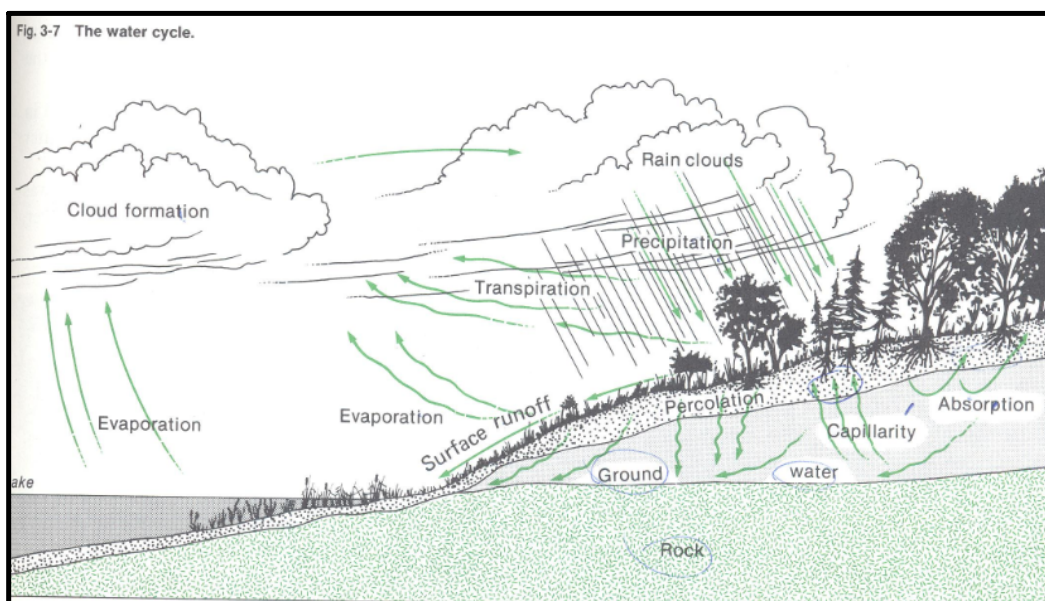
The Water Cycle

The hydrogen and oxygen atoms in water are nutrients organisms need. These nutrients are recycled through ecosystems as follows.

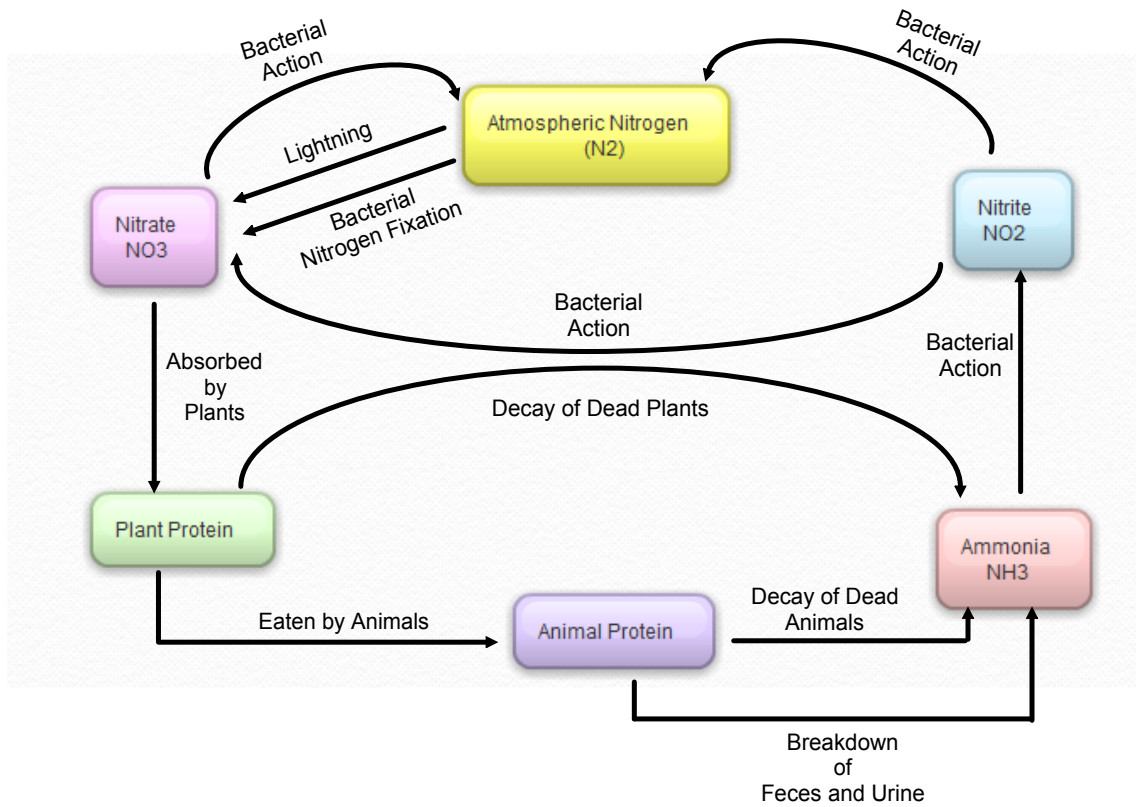
Water vapour enters the atmosphere through **transpiration** from vegetation. (Transpiration is the loss of water through pores in the leaves of plants.) It also enters the atmosphere by evaporating from bodies of water and the soil (Fig. 3-7). In the cool upper atmosphere this vapour condenses, forming clouds. In time, enough water collects in the clouds to cause **precipitation**. When this happens, some of the water that falls on the ground runs along the surface of the ground to a stream, pond, or other body of water. This water is called **surface runoff**. But some of the water also soaks into the ground by a process called **percolation**. Some water percolates down to the bedrock. Then it becomes **ground water** and gradually runs back to lakes and other bodies of water.

Some of the water in the soil moves up to the roots of plants by **capillarity**. The roots absorb the water. This is how most plants get the hydrogen and oxygen they need. Animals can obtain water by eating plants or by eating other animals. Of course, they can also obtain it by drinking water directly from a body of water.

Finally, when plants and animals die, they decompose. During this process, the water in their tissues is released back into the environment.



Nitrogen Cycle



*nitrogen fixation - the changing of nitrogen to nitrates

[Bubbl.us]



Attachments

NOTES - Nutrients and Cycles.pdf