

Essential nutrients:

Nutrients that need to be provided to an organism

What are the two types of essential nutrients?

Macronutrients → needed in large amounts

- Lipids, carbohydrates, proteins, *etc.*

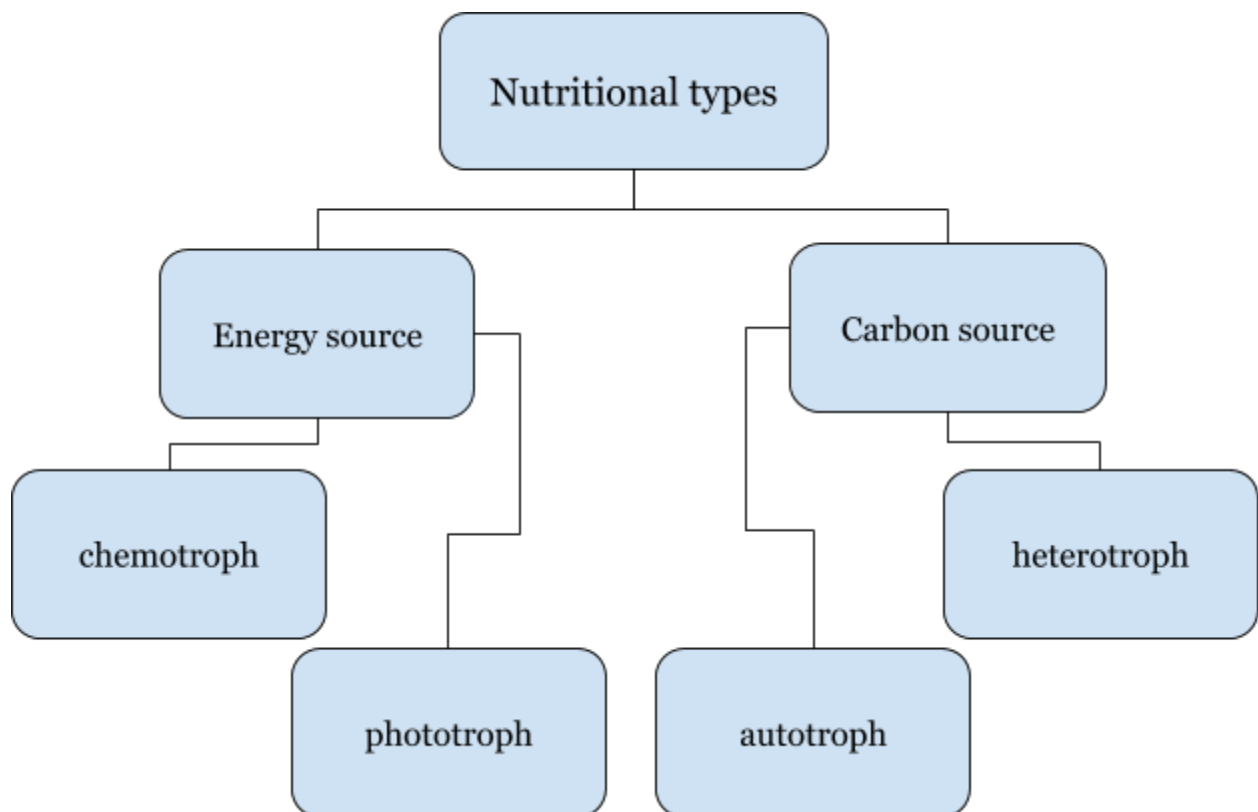
Micronutrients (trace elements) → needed in small amounts

- Nickel, zinc, *etc.*

What must be present for a compound to be organic?

Carbon and Hydrogen

Water is an inorganic compound.

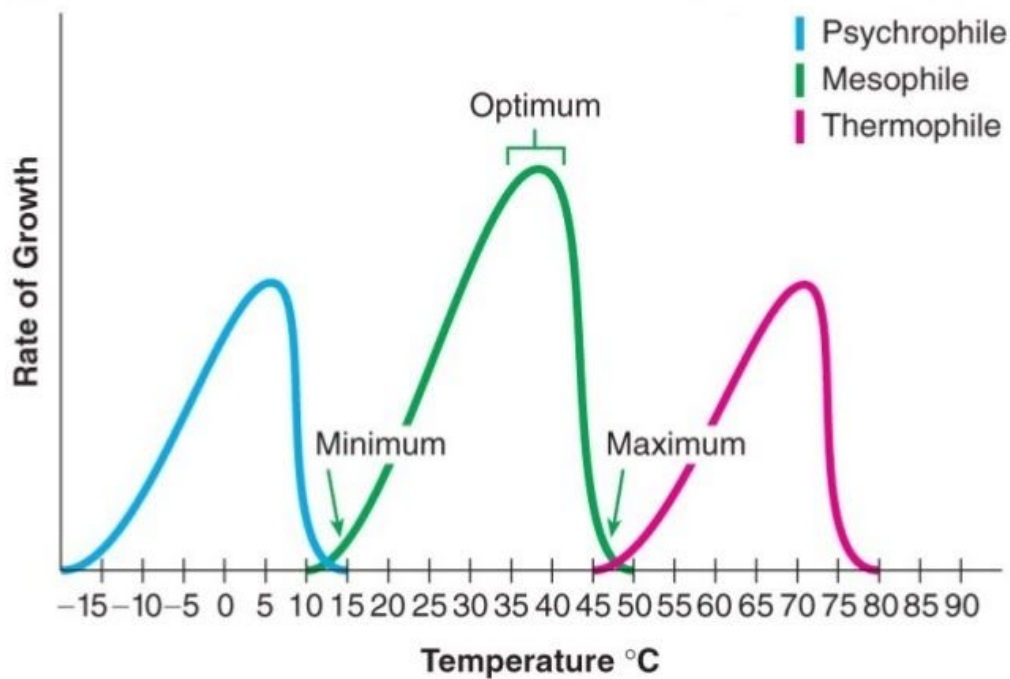


Give examples of the following types of organisms:

- Photoautotroph → cyanobacteria & algae
- Chemoautotroph → methanogens
- Photoheterotroph → purple & green photosynthetic bacteria

Break down the categories of chemoheterotrophs.

- Saprobes: *feed on organic material from dead organisms*
  - Free-living
  - Opportunistic pathogen
  - Facultative parasite
- Parasites: *derive nutrients at the expense of the host*
  - Pathogens
  - Obligate parasites



<b>Element</b>	<b>Found in:</b>	<b>Functions</b>
H	Organic & inorganic compounds (water, salts, & gases)	* Maintain pH * Oxygen acceptor
O	Carbohydrates, lipids, nucleic acids, & proteins	* Structural & enzymatic cellular functions * Essential to metabolism
P	Rocks & oceanic mineral deposits Nucleic acids	* energy transfer
S	Rocks, sediments, gases, & some vitamins and amino acids	* stability of proteins (forms disulfide bonds)
N	Nitrogen gas Proteins, DNA, RNA, & ATP	* synthesize amino acids & other compounds

Foodborne intoxication requires the consumption of live microorganisms.

- a. True
- b. False**

List the enzymes used to convert superoxide ions.

Superoxide dismutase & catalase

How do microbes that lack enzymes needed to convert toxic oxygen live?

They live in environments with no oxygen

