What are fungi?

Singular = FUNGUS
Plural = FUNGI
A fungus is ... 
Fungi are...

Origin of word fungus
Two schools of thought:

\textit{sp(h)ongos} - Greek
= sponge-like

\textit{fungor} - Latin
= to flourish

Both words probably relate to nature of fungal structures we call mushrooms or toadstools

\begin{enumerate}
\item \textbf{Definition of Fungi}

Eucaryotic, heterotrophic and absorptive organisms, which have cell walls, typically reproduce asexually and/or sexually by producing spores, and grow either reproductively by budding or nonreproductively by hyphal tip elongation.

Definition excludes:

1. bacteria & blue-green algae (prokaryotes)
2. slime molds
3. true algae & higher plants
4. animals
5. etc.

Definition may include some non-fungi

1. Oomycetes (water molds)
2. etc.
No perfect definition

1. Fungi historically have represented a very heterogenous grouping of unrelated or only distantly related organisms.

2. Adaptation of related or unrelated fungi or fungal-like organisms to similar ecological niches have led to structural trends that obscured fungal origins (phylogeny*)

* Phylogeny = evolutionary history of genetically related organisms

A. Monophyletic - one origin
B. Polyphyletic - multiple origins

Trends in evolution that tended to obscure fungal nature (phylogeny)

1. Convergent Evolution
   unrelated organisms superficially come to look alike
   e.g. some fungi and colorless algae

2. Parallel Evolution
   members of unrelated groups evolve along similar paths
   e.g. some fungi and animals, like slime molds

3. Divergent Evolution

Related organisms come to have very different biology - they took different paths of evolution (adaptation)
Fungal nutritional types

1. Saprophytes

2. Symbionts
   a. mycothallal fungi
      e.g. lichens
   b. mycorrhizal fungi
      - ectomycorrhizal = can be free-living
      - endomycorrhizal = obligate symbionts
   c. animal-fungal partners
      e.g. gut fungi

3. Pathogens
   a. majority plant pathogens
   b. many animal pathogens
   c. relatively few but increasing # of human pathogens