Protists:
- All are eukaryotes
- They can be producers or consumers
- Protists are classified by the way that they obtain energy
- Fungus-like
- Animal-like
- Plant-like

Fungus-like:
- Obtains energy from dead organic matter or the body of another organism - heterotrophes
- Consumers - secrete digestive juices
- Reproduce like fungi - spores
- Two examples are slime molds and water molds

Which one caused the potato famine in Ireland in 1846? A water mold

Plant like:
- Obtain energy from the sun - producers or autotrophs
- Also known as Algae - use photosynthesis just like plants, all contain chlorophyll
- All live in water and can be unicellular - phytoplankton - or multi-cellular - seaweed or kelp
- Divided into phyla according to color and cell structure

<table>
<thead>
<tr>
<th>Red Algae</th>
<th>Brown Algae</th>
<th>Green Algae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of worlds seaweed</td>
<td>Found in cold climates - seaweed</td>
<td>Most are single celled, but they can be multi-cellular</td>
</tr>
<tr>
<td>Have a red pigment</td>
<td>Have yellow-brown pigment</td>
<td>Found all over - water and land</td>
</tr>
<tr>
<td>Live mainly in tropical marine waters</td>
<td>Grow very large</td>
<td>Live in colonies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diatoms</th>
<th>Dinoflagellates</th>
<th>Euglenoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single celled</td>
<td>Most are single-celled</td>
<td>Producers but if there is not enough light they become consumers</td>
</tr>
<tr>
<td>Found in salt and fresh water</td>
<td>Most are in salt water</td>
<td>Have animal and plant characteristics</td>
</tr>
<tr>
<td>Use photosynthesis</td>
<td>Use photosynthesis</td>
<td>Can eat small protists or</td>
</tr>
<tr>
<td>Cell walls made up of silica and cellulose</td>
<td>Can cause Red tide</td>
<td></td>
</tr>
</tbody>
</table>

Animal-like Protists
- Single celled consumers
- Also known as protozoa and are considered parasites
- Divided into four phyla:

<table>
<thead>
<tr>
<th>Amoabalike protists</th>
<th>Ciliates</th>
<th>Spore-forming protists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft jelly-like</td>
<td>Most complex protozoa</td>
<td>Are all protozoa that are parasites</td>
</tr>
<tr>
<td>Found in both fresh and salt water</td>
<td>Use cilia for movement and feeding</td>
<td>Cannot move on their own</td>
</tr>
<tr>
<td>Have contractile vacuoles and pseudopodia</td>
<td>Have two nuclei</td>
<td>Have complicated life-cycles involving 2 or more hosts</td>
</tr>
</tbody>
</table>

Flagellates
- Use flagella to move
- Can live in water or are parasites
- Can live in symbiosis
Reproduction:

Asexual reproduction:
- Amoebas
- Euglena

Sexual Reproduction:
- Paramecium reproduce by conjugation

Many will reproduce asexually one year and sexually the next depending on the availability of mates

Fungi:

Actual fungi descriptor words:
- Eukaryotic
- Mostly Multi-cellular
- Heterotrophic

Fun Fungi Facts:
- Classified according to how they reproduce
- There are 5 phyla of fungi
- The suffix "mycota" tells us that we are dealing with a fungus (ascomycota)
- They do not ingest food, they absorb it into their bodies as they live on and decompose dead organisms

A Fungus is among us!

- Are all eukaryotes
- All fungi use a similar way of obtaining food and reproducing.
- Fungi are consumers, but do not eat or engulf food... they can be decomposers or parasites
- Most obtain nutrients by secreting digestive juices onto a food source, then absorbing the dissolved substances.
- Some live in symbiotic relationships with other organisms.

For example:
- Some fungi grow on the roots of plants. The fungi release an acid that changes the chemicals in the soil that the plant can use.

Parts of a fungus:

- Hyphae: fungal filaments that are similar to plant roots except that the cells have openings that allow the cytoplasm to move freely between the cells.
- Mycelium: the major part of the fungus where the hyphae are twisted together, usually under the ground.
Reproduction:

Asexual:
- the hyphae break apart and each new piece becomes a new fungi
- production of spores

Sexual:
_Certain types of fungus have special structures that form sex cells._
- Two sex cells then join to produce spores

Phylum: Zygomycota or Thread-like Fungi:
- Common molds on bread and cheese
- Sexual reproduction: form a zygote
- Asexual reproduction: the sporangia is what you see, it contains the spores

Phylum: Ascomycota or Sac fungi:
- What you see is the “fruiting body” or reproductive center
- Many are parasites
- Asexual spores produced in the conidia
- Sexual reproduction on the ascus
- Ex. Yeast

Club Fungi:
- Umbrella shaped
- Sexual reproduction: formation of basidia which contain the sexual spores
- Some of these are found in supermarkets but some are very poisonous

Phylum: Deuteromycotes
_imperfect fungi - do not fit with any of the others_
- Imperfect because their reproduction has never been scientifically observed - asexual?
- Penicillin
- can cause - ringworm, athlete’s foot, black spot, tomato blight
Mycophyta:
Fungi (myco) + plants (phyta)
- Ex. Lichens - a fungus and an algae the grow intertwined
- are producers
- Found on rocks, trees, ground
- Many colors
- A Mutualistic Symbiotic relationship between a heterotrophic fungi and a green algae or cyanobacteria

Fungi and the world
- Decomposers: break down the bodies of dead organisms and wastes
- Beneficial: making foods, beer and wine, medicines
- Detrimental: parasites- athlete's foot and ringworm

An Ode to a Fungus!

Beautiful, black fuzzy mold!
You grow in my fridge on food that is old.
Fungi! Yummy truffles that I love to eat,
When you are imperfect, you grow on my feet.
Most fungi eat things that are dead,
Except for yeast that help me make bread.
Some fungi are used to make cheese,
And when I breathe they make me wheeze.
Mushrooms are fungi, and some taste quite good,
But others are poisonous - don't mistake them for food!
Many shapes, sizes, and colors you can be
Reproducing your hyphae asexually!