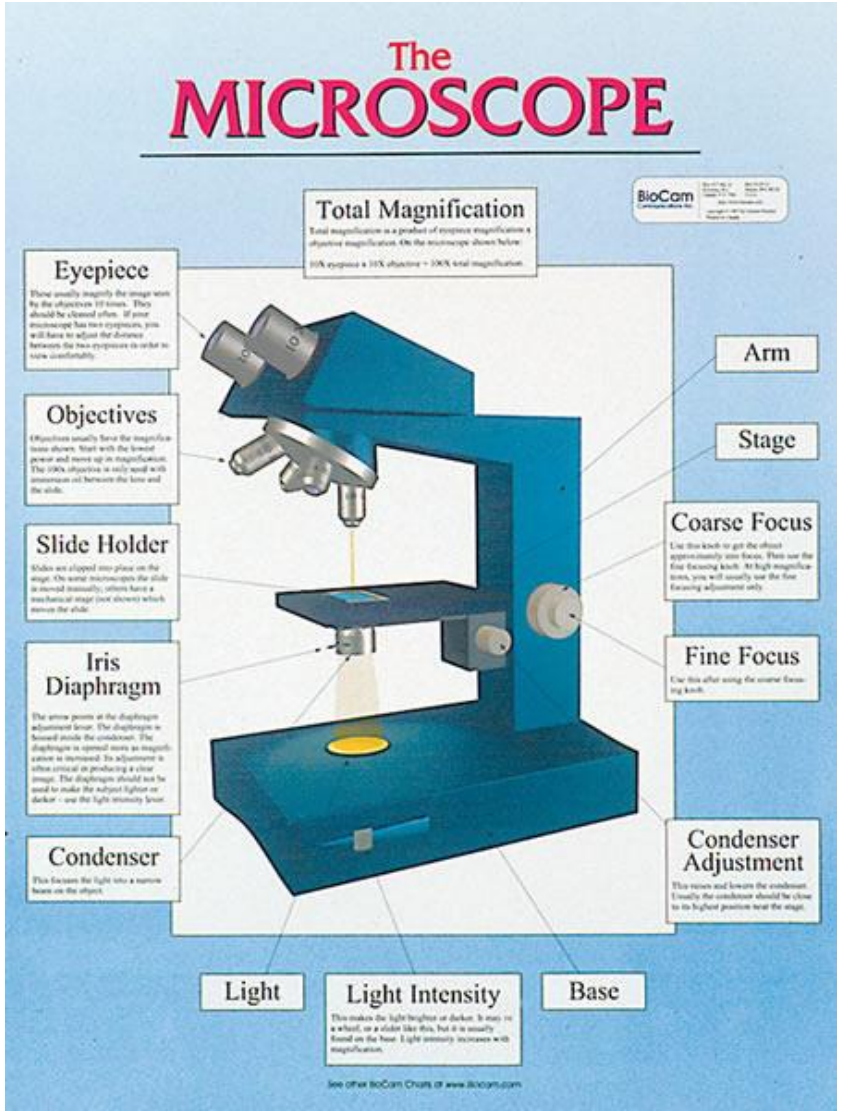
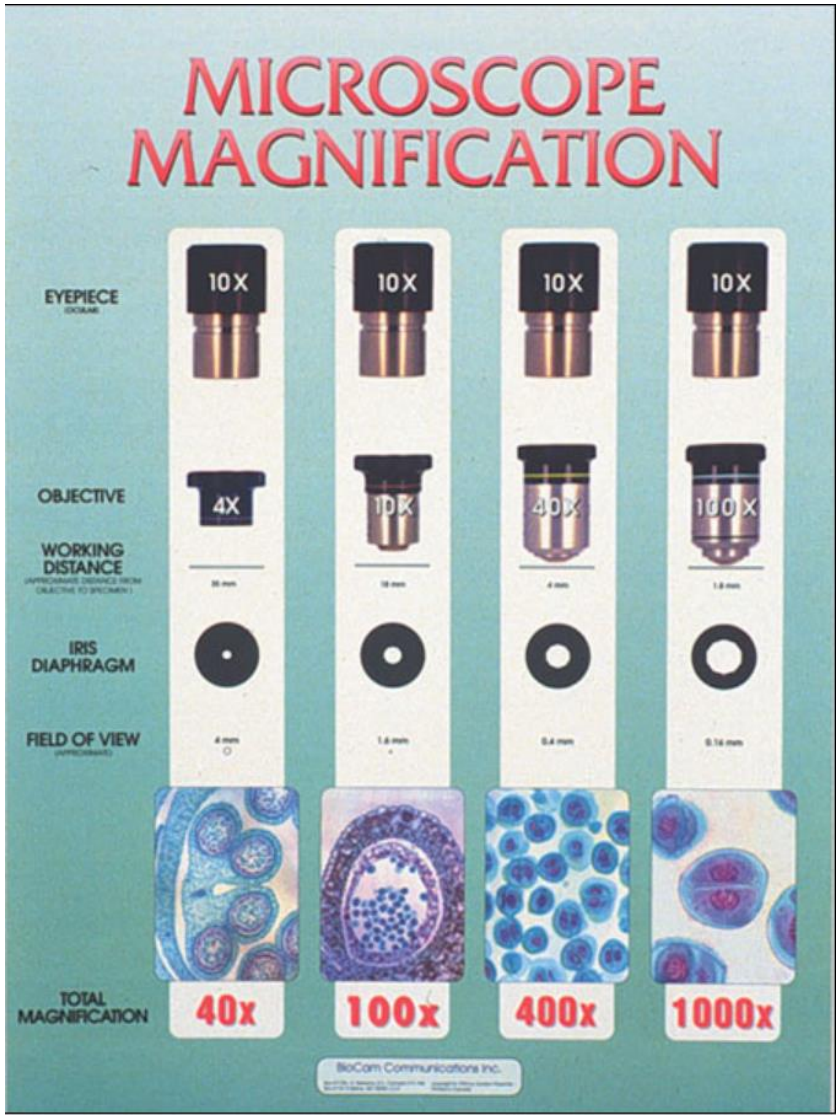
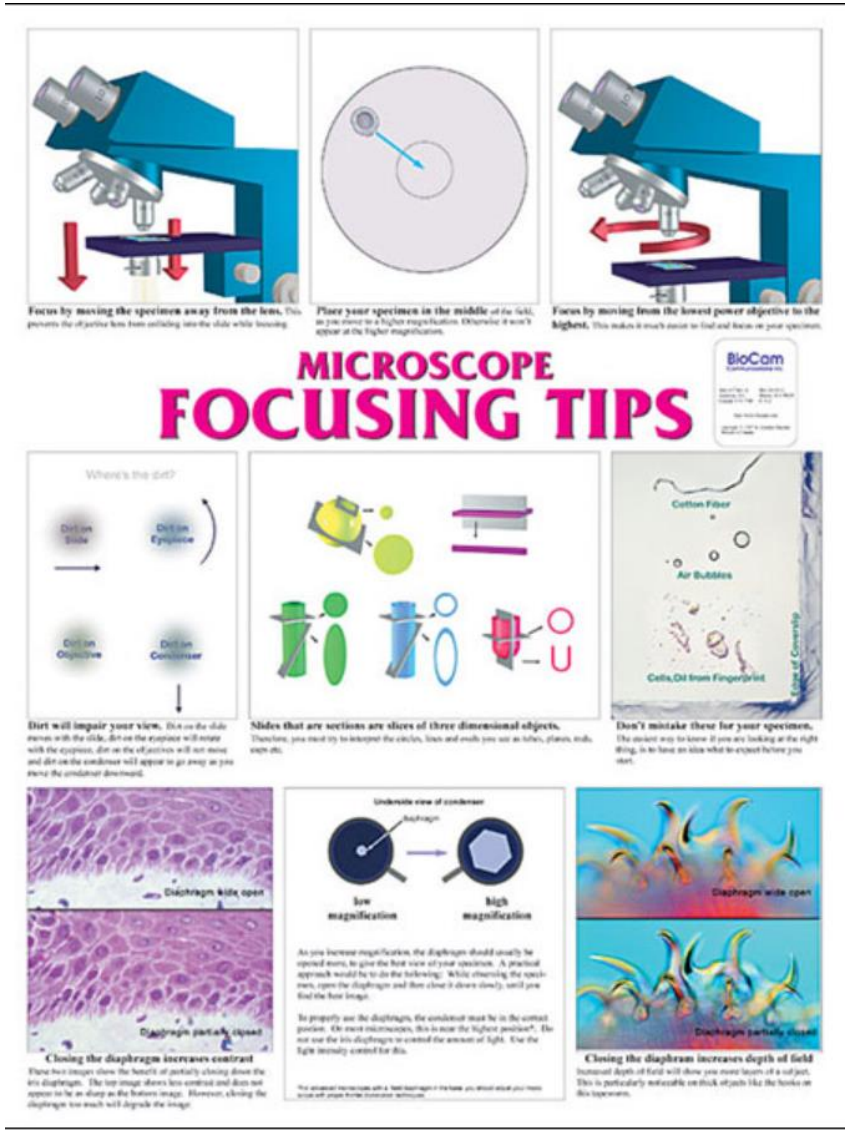
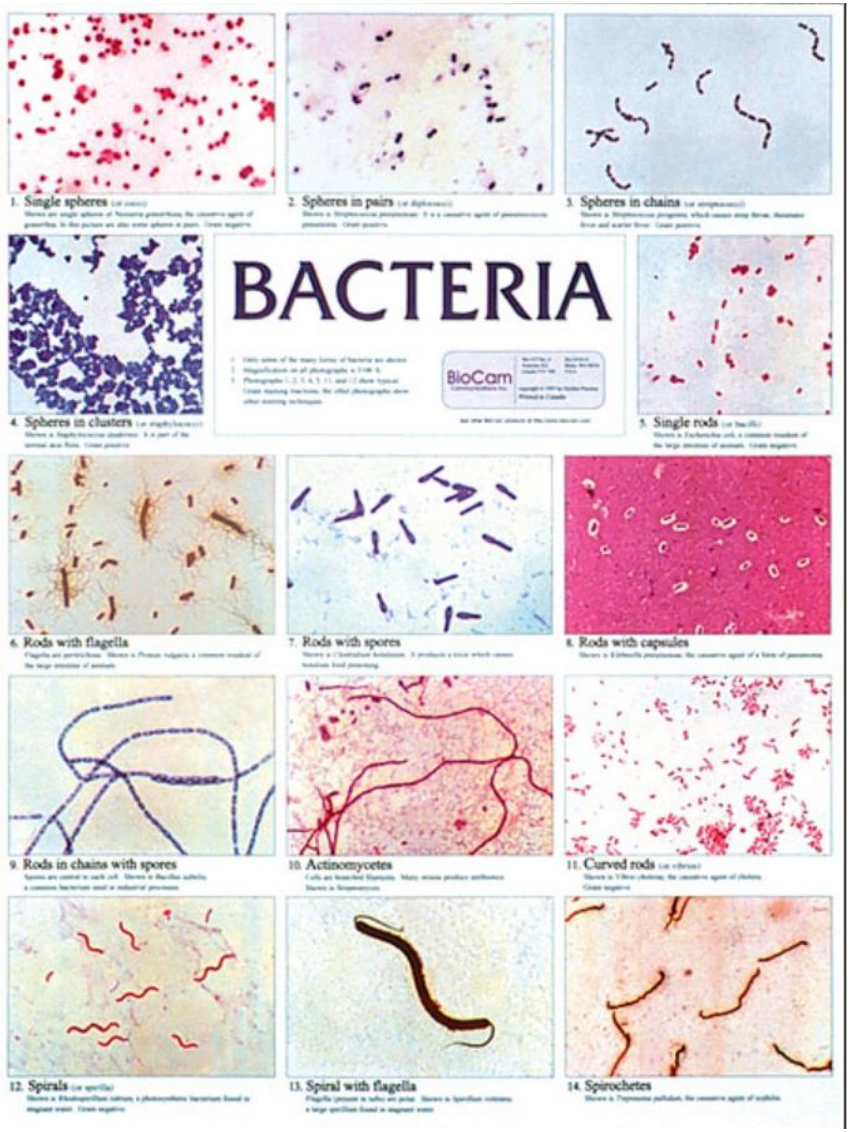
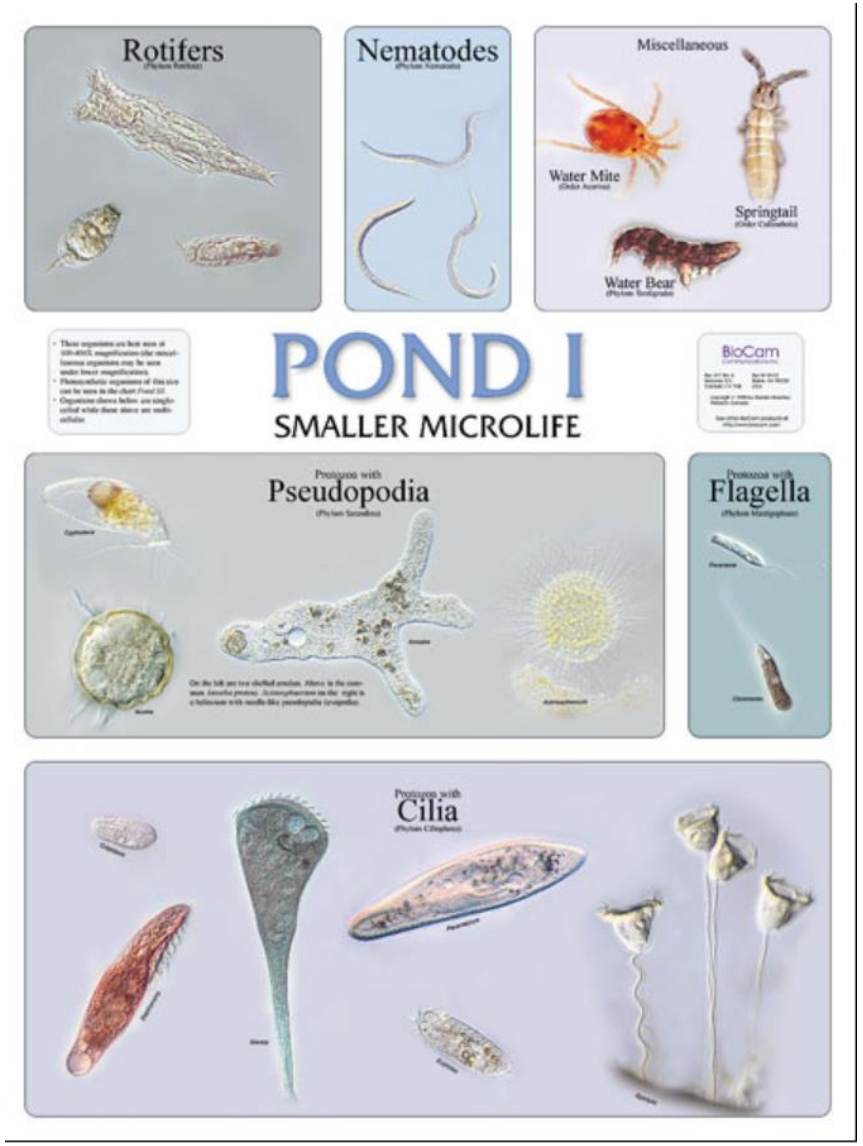
<u>BSC2011L Posters</u> - all posters courtesy of BioCam Charts. They may be accessed at:
http://www.biocam.com/Biocam_wall_charts_gallery.html

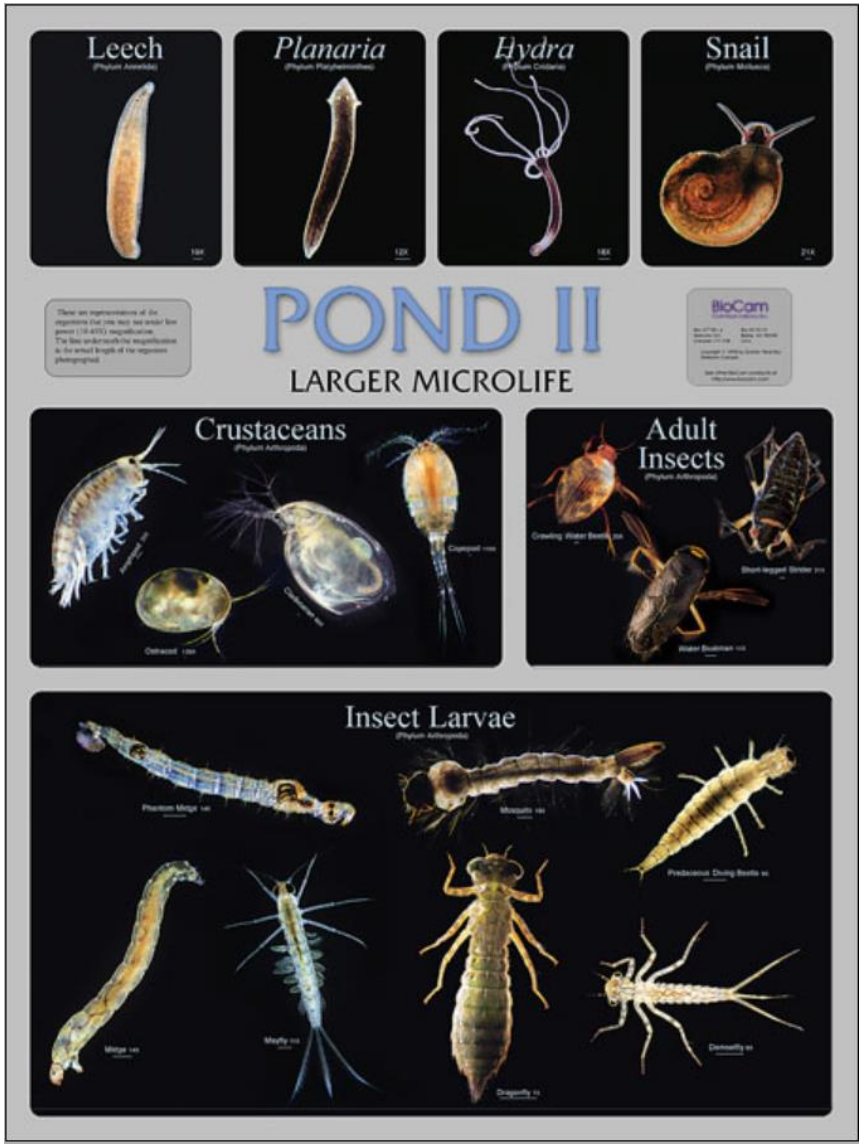


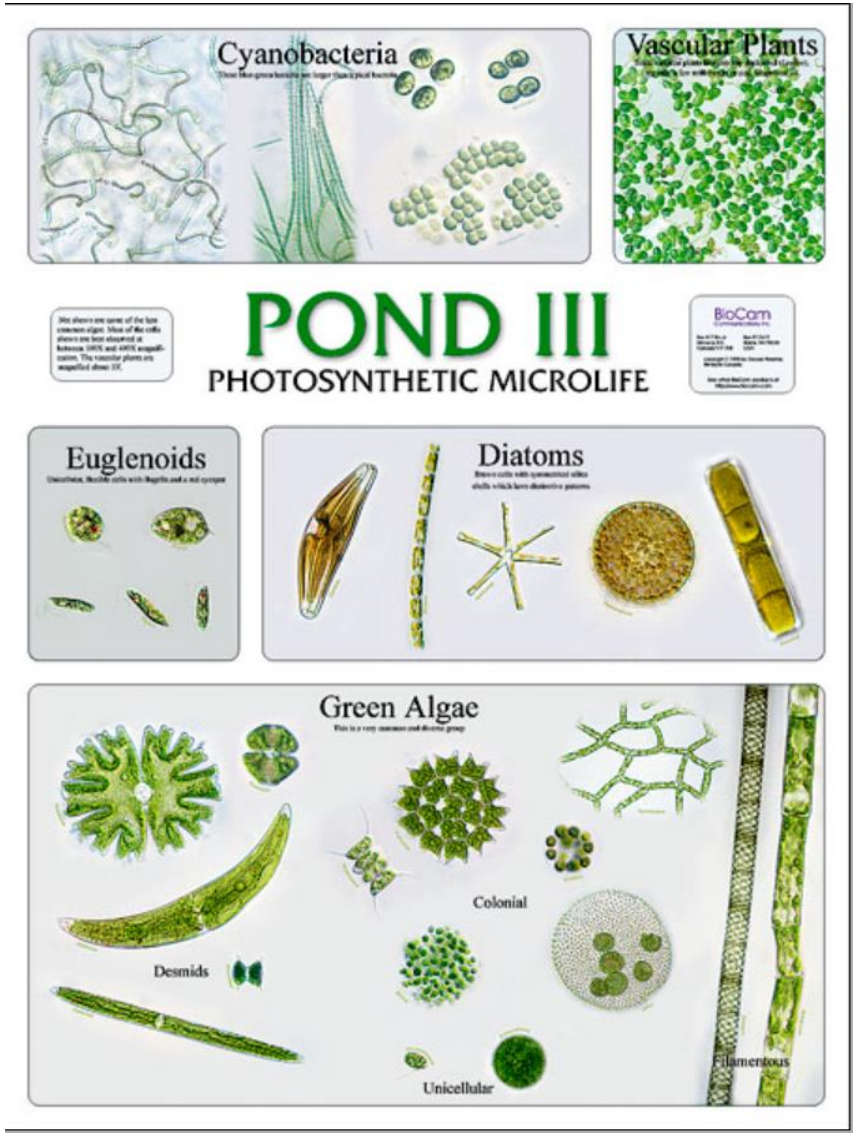


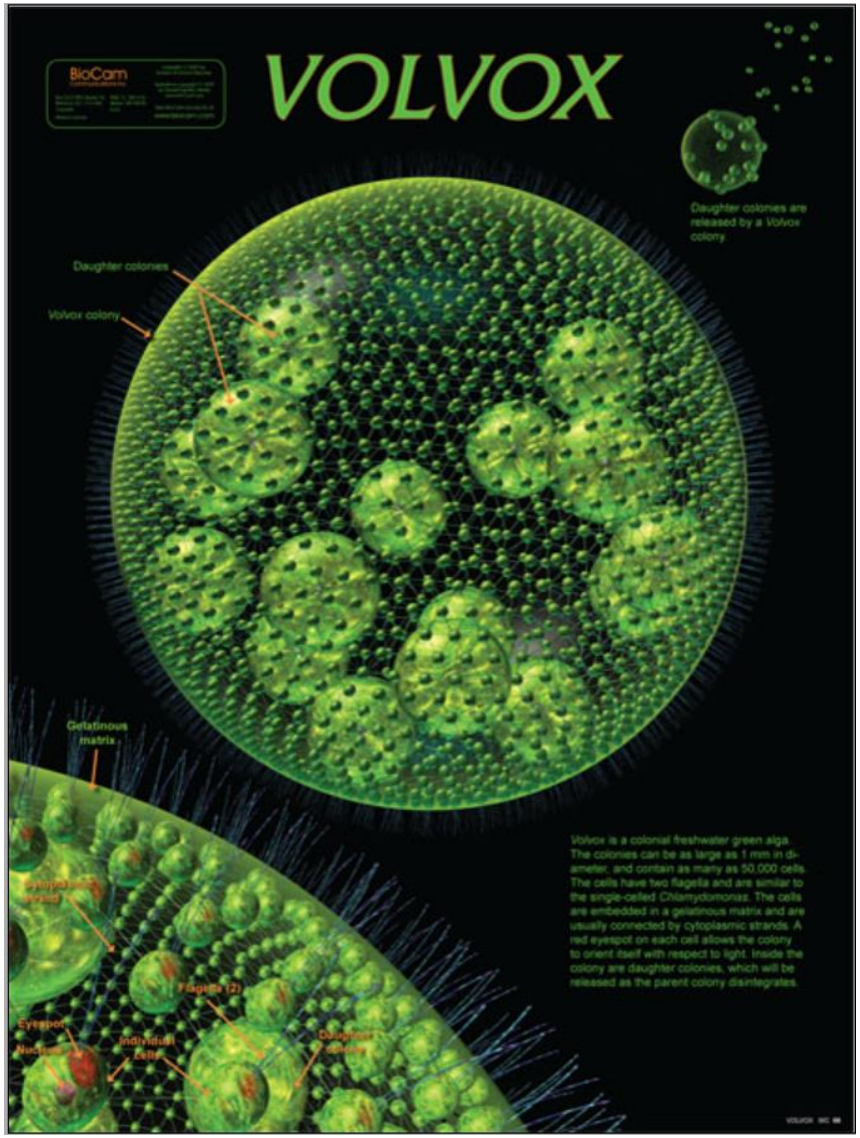

MICROSCOPE
FOCUSING TIPS
BioCam
Focus by moving the specimen away from the lens.
Place your specimen in the middle
Focus by moving from the lowest power objective to the highest.
Where's the dirt?
Dirt on Slide
Dirt on Eyepiece
Dirt on Objective
Dirt on Condenser
Dirt will impair your view.
Slides that are sections are slices of three dimensional objects.
Cotton Fiber
Air Bubbles
Cells,Oil from Fingerprint
Edge of Coverslip
Don't mistake these for your specimen.
Diaphragm wide open
Diaphragm partially closed
Closing the diaphragm increases contrast
Underside view of condenser
Aperture
low magnification
high magnification
Diaphragm wide open
Diaphragm partially closed
Closing the diaphragm increases depth of field

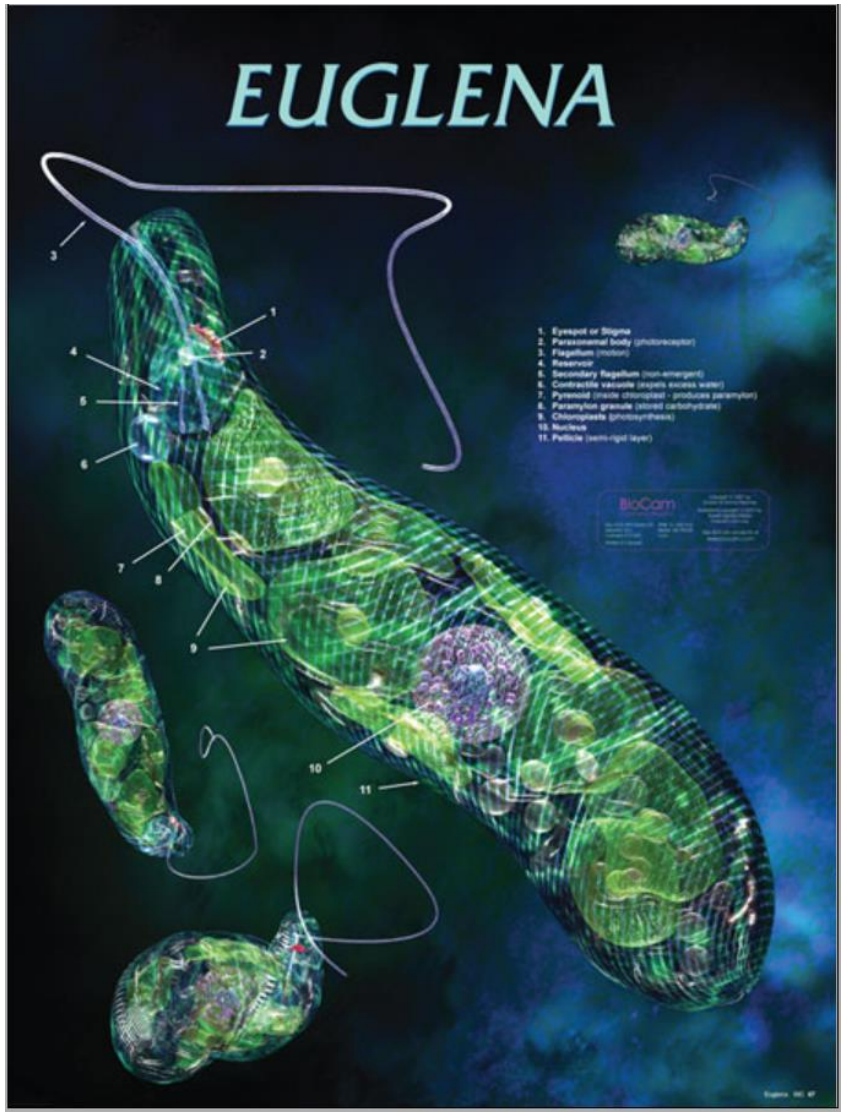

1. Single spheres
2. Spheres in pairs
3. Spheres in chains
BACTERIA
BioCam
4. Spheres in clusters
5. Single rods
6. Rods with flagella
7. Rods with spores
8. Rods with capsules
9. Rods in chains with spores
10. Actinomycetes
11. Curved rods
12. Spirals
13. Spiral with flagella
14. Spirochetes

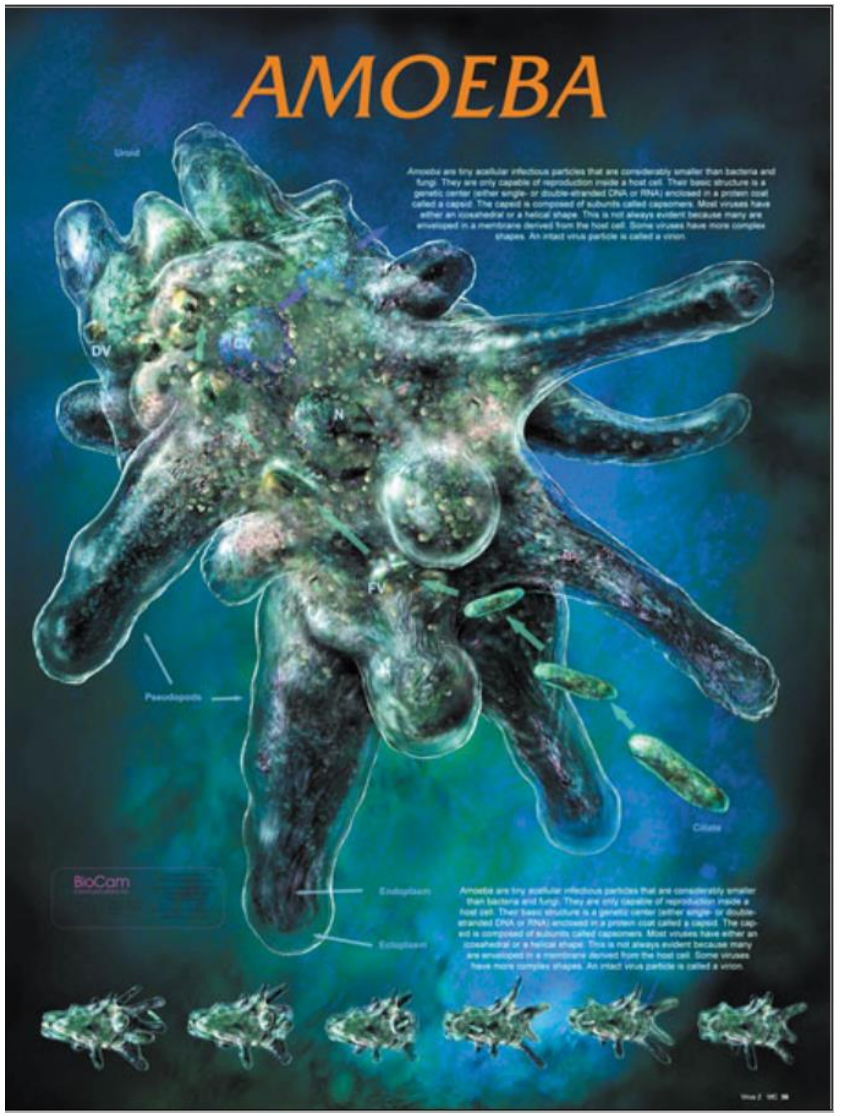

Rotifers
Nematodes
Miscellaneous
Water Mite
Springtail
Water Bear
POND I
SMALLER MICROLIFE
BioCam
Protozoa with
Pseudopodia
Protozoa with
Flagella
Protozoa with
Cilia

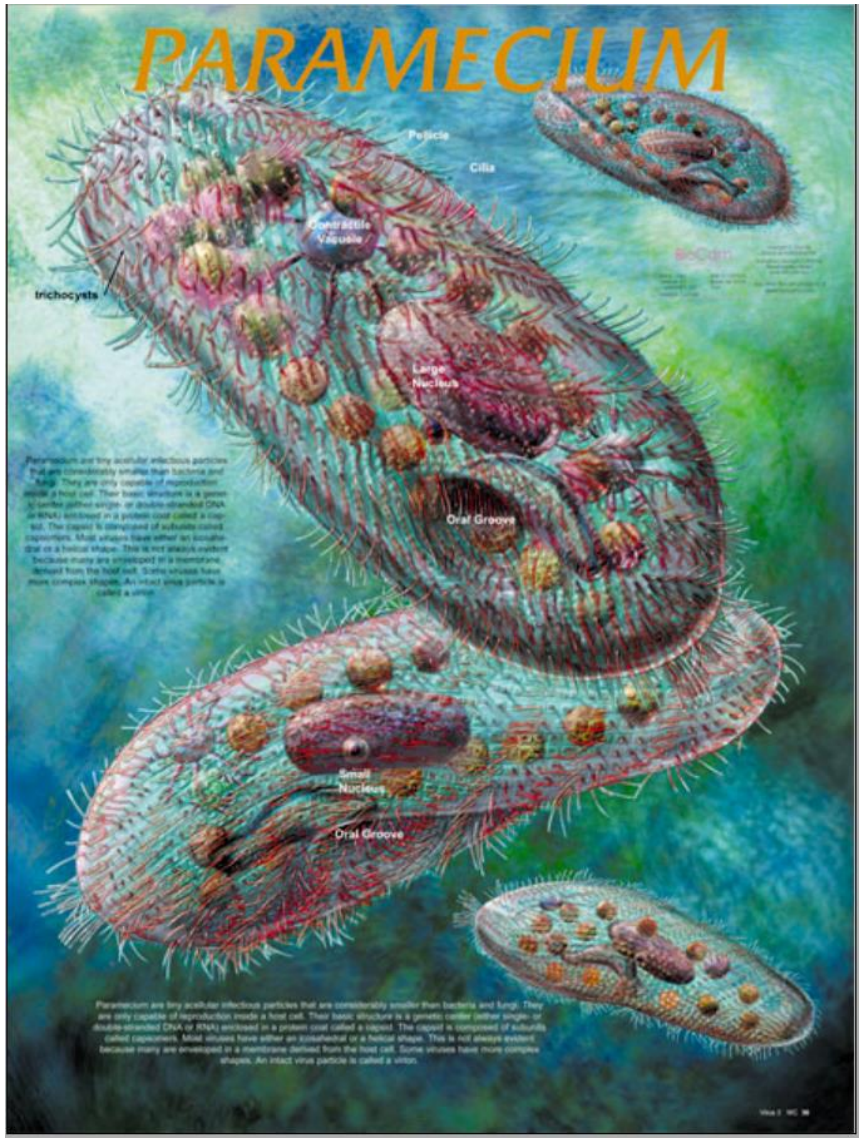

Leech
Planaria
Hydra
Snail
POND II
LARGER MICROLIFE
BioCam
Crustaceans
Adult
Insects
Insect Larvae

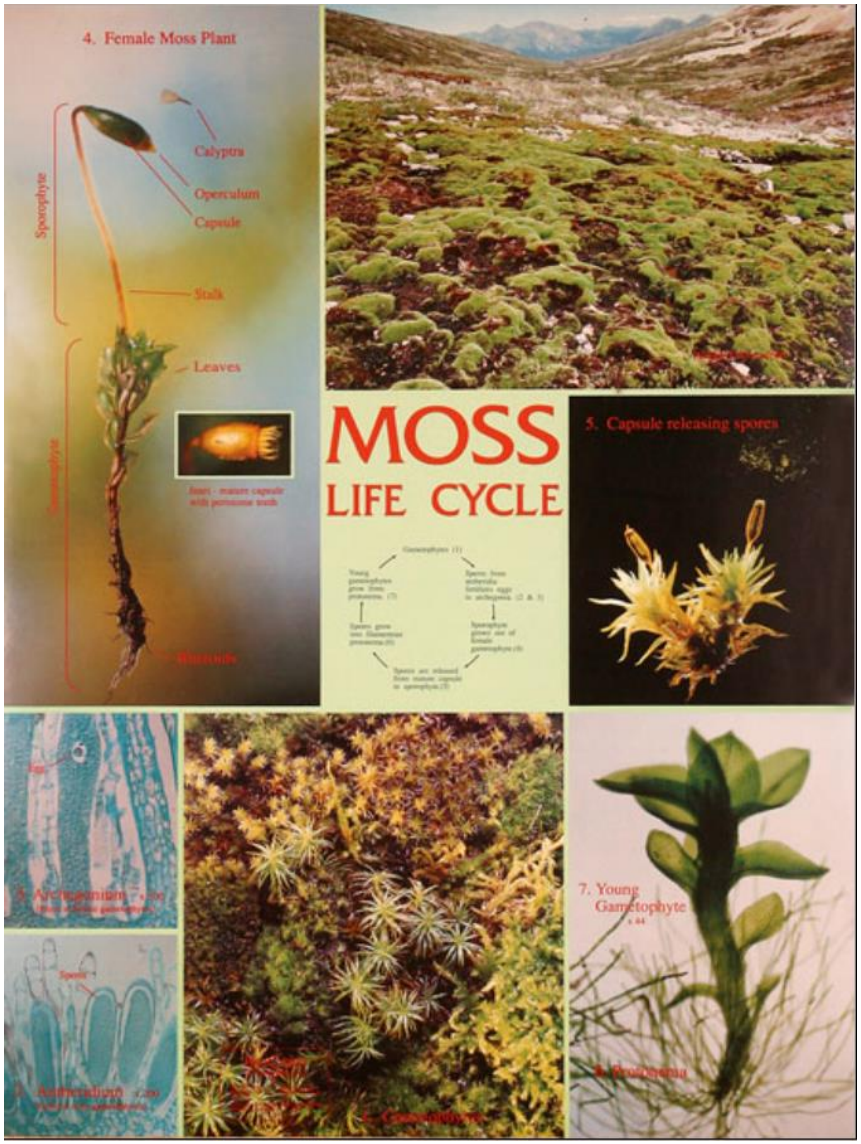

Cyanobacteria
Vascular Plants
POND III
PHOTOSYNTHETIC MICROLIFE
BioCam
Euglenoids
Diatoms
Green Algae
Desmids
Colonial
Unicellular
Filamentous


VOLVOX
BioCam
Daughter colonies are released by a Volvox colony.
Daughter colonies
Volvox colony
Gelatinous matrix
Flagella (2)
Eyespot
Nucleus
Individual cells
Volvox is a colonial freshwater green alga. The colonies can be as large as 1 mm in diameter, and contain as many as 50,000 cells. The cells have two flagella and are similar to the single-celled Chlamydomonas. The cells are embedded in a gelatinous matrix and are usually connected by cytoplasmic strands. A red eyespot on each cell allows the colony to orient itself with respect to light. Inside the colony are daughter colonies, which will be released as the parent colony disintegrates.

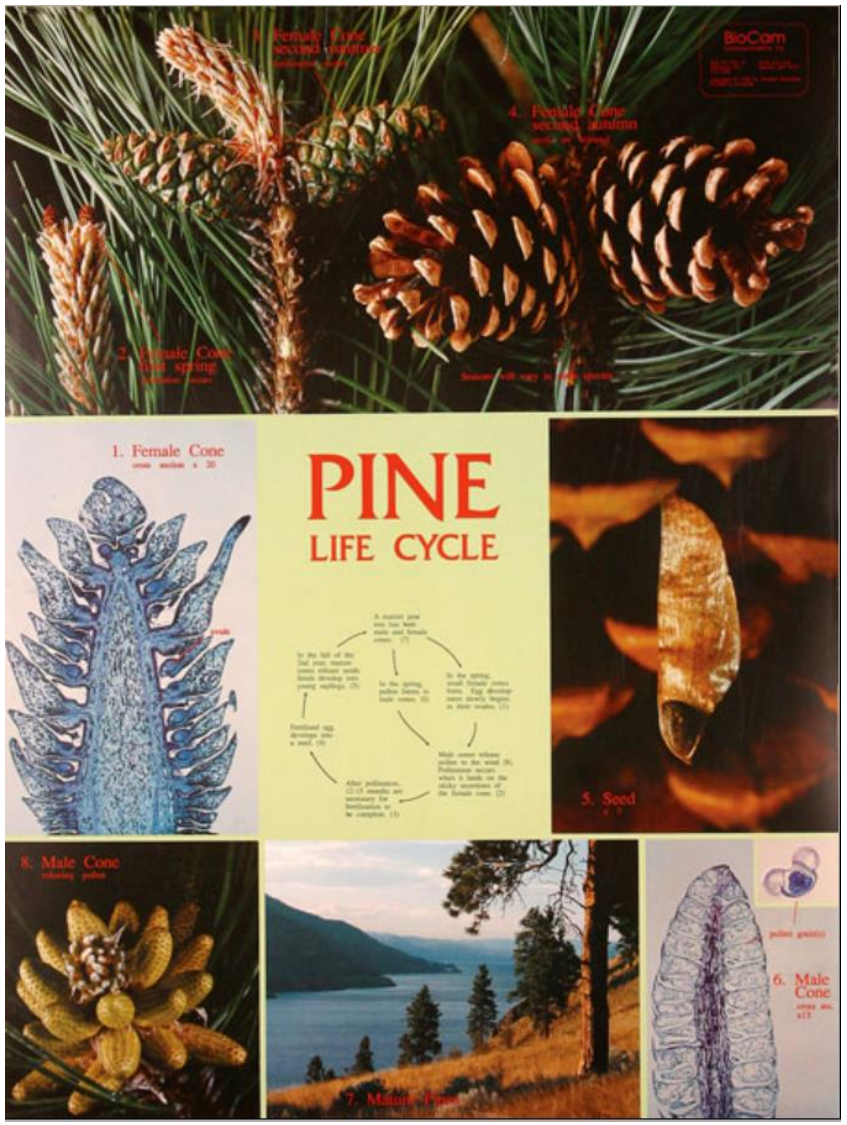

EUGLENA
1. Eyespot or Stigma
2. Paraxonemal body (photoreceptor)
3. Flagellum (motion)
4. Reservoir
5. Secondary flagellum (non-emergent)
6. Contractile vacuole (expels excess water)
7. Pyrenoid (inside chloroplast - produces paramylon)
8. Paramylon granule (stored carbohydrate)
9. Chloroplasts (photosynthesis)
10. Nucleus
11. Pellicle (semi-rigid layer)
BioCam

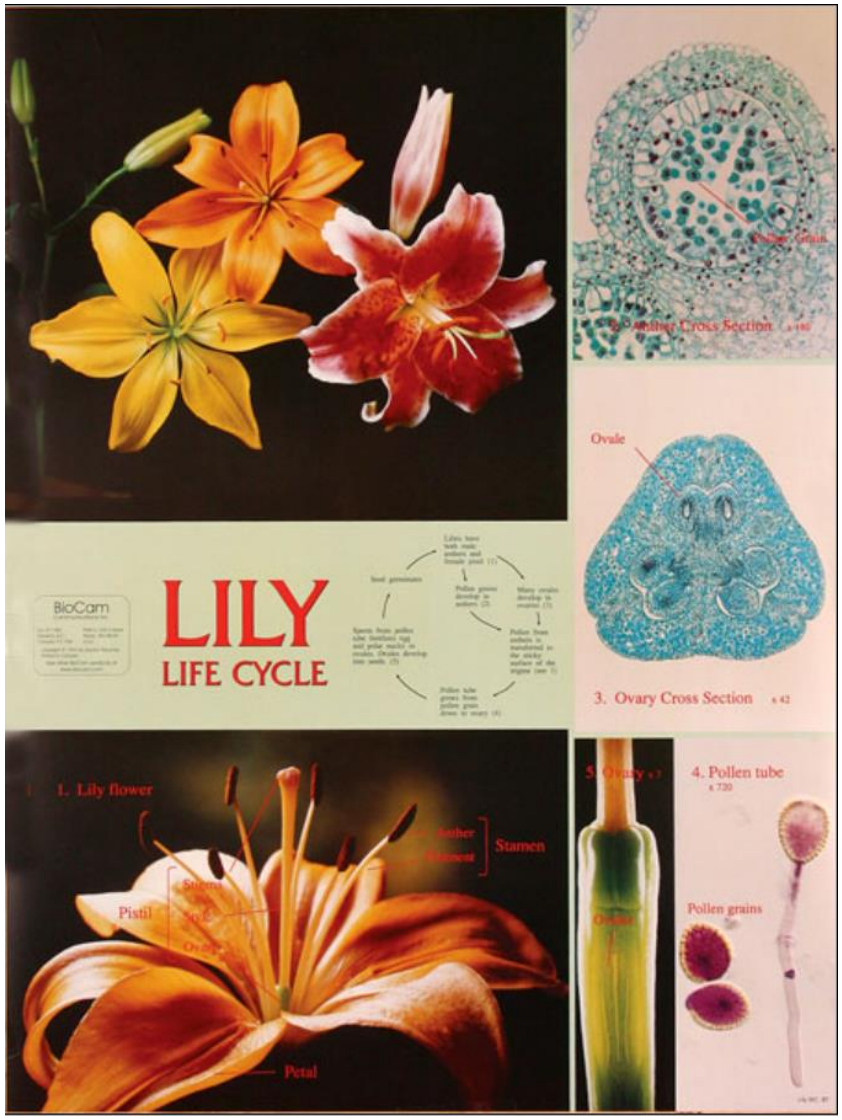

AMOEBA
Uroid
Amoeba are tiny acellular infectious particles that are considerably smaller than bacteria and fungi. They are only capable of reproduction inside a host cell. Their basic structure is a genetic center (either single- or double-stranded DNA or RNA) enclosed in a protein coat called a capsid. The capsid is composed of subunits called capsomers. Most viruses have either an icosahedral or a helical shape. This is not always evident because many are enveloped in a membrane derived from the host cell. Some viruses have more complex shapes. An intact virus particle is called a virion.
DV
CV
N
FV
Pseudopods
Ciliate
BioCam
Ectoplasm
Endoplasm
Amoeba are tiny acellular infectious particles that are considerably smaller than bacteria and fungi. They are only capable of reproduction inside a host cell. Their basic structure is a genetic center (either single- or double-stranded DNA or RNA) enclosed in a protein coat called a capsid. The capsid is composed of subunits called capsomers. Most viruses have either an icosahedral or a helical shape. This is not always evident because many are enveloped in a membrane derived from the host cell. Some viruses have more complex shapes. An intact virus particle is called a virion.

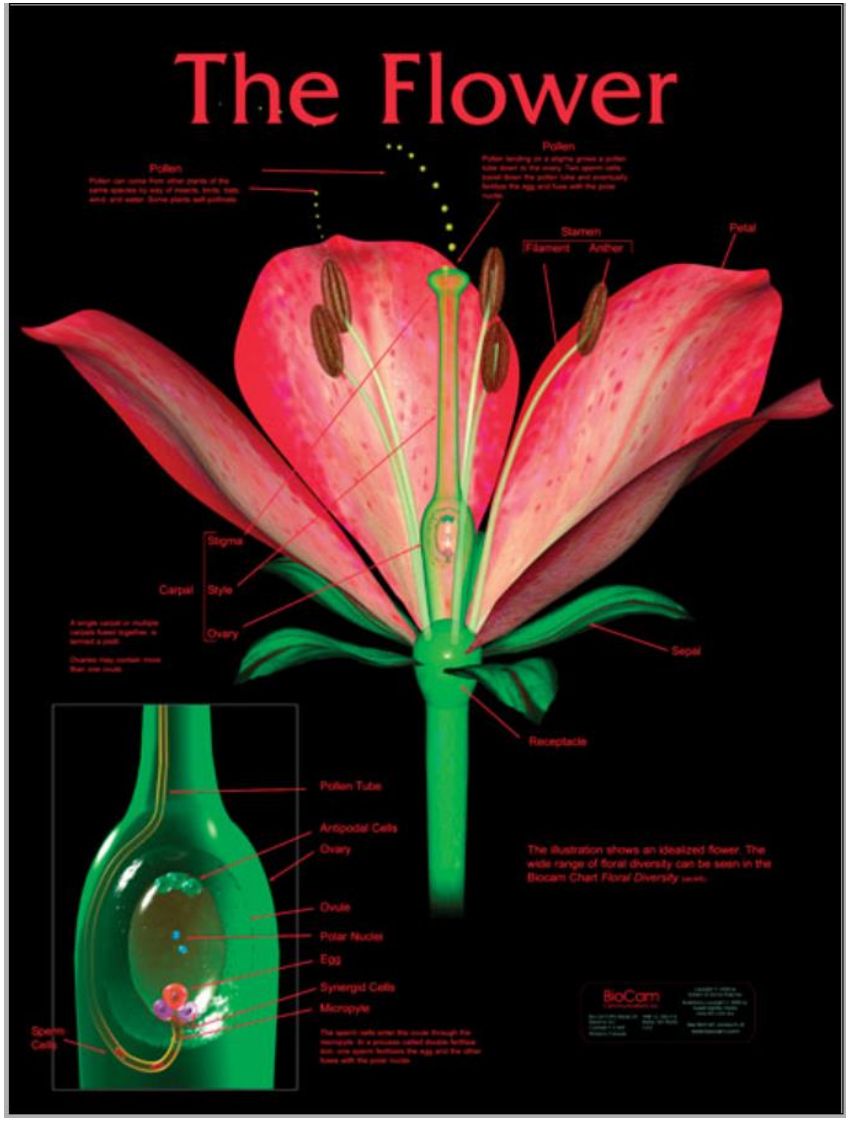

PARAMECIUM
Pellicle
Cilia
Contractile Vacuole
trichocysts
Large Nucleus
Oral Groove
Small Nucleus
Oral Groove
Paramecium are tiny acellular infectious particles that are considerably smaller than bacteria and fungi. They are only capable of reproduction inside a host cell. Their basic structure is a genetic center (either single- or double-stranded DNA or RNA) enclosed in a protein coat called a capsid. The capsid is composed of subunits called capsomers. Most viruses have either an icosahedral or a helical shape. This is not always evident because many are enveloped in a membrane derived from the host cell. Some viruses have more complex shapes. An intact virus particle is called a virion.


4. Female Moss Plant
Sporophyte
Gametophyte
Calyptra
Operculum
Capsule
Stalk
Leaves
Rhizoids
MOSS
LIFE CYCLE
5. Capsule releasing spores
6.
7. Young Gametophyte


1. Mature Sporophyte
2. Frond with Sori
Sorus
7. Fiddleheads
FERN LIFE CYCLE
3. Prothallus
archegonium
antheridium
BioCam
Prothallus
Primary root
6. Young sporophyte
5. Archegonium
4. Antheridium

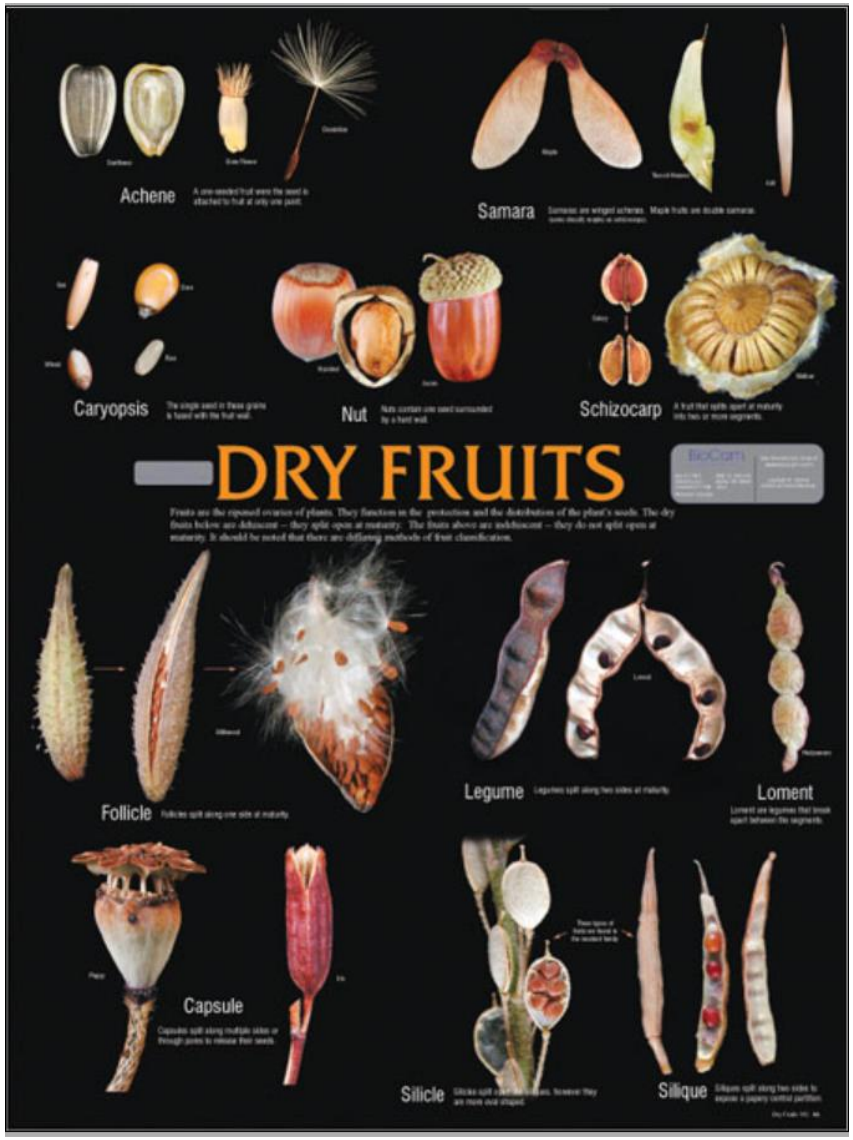

Female Cone
second autumn
BioCam
4. Female Cone
second autumn
2. Female Cone
first spring
1. Female Cone
ovule
PINE
LIFE CYCLE
5. Seed
8. Male Cone
releasing pollen
7. Mature Tree
pollen grain(s)
6. Male
Cone

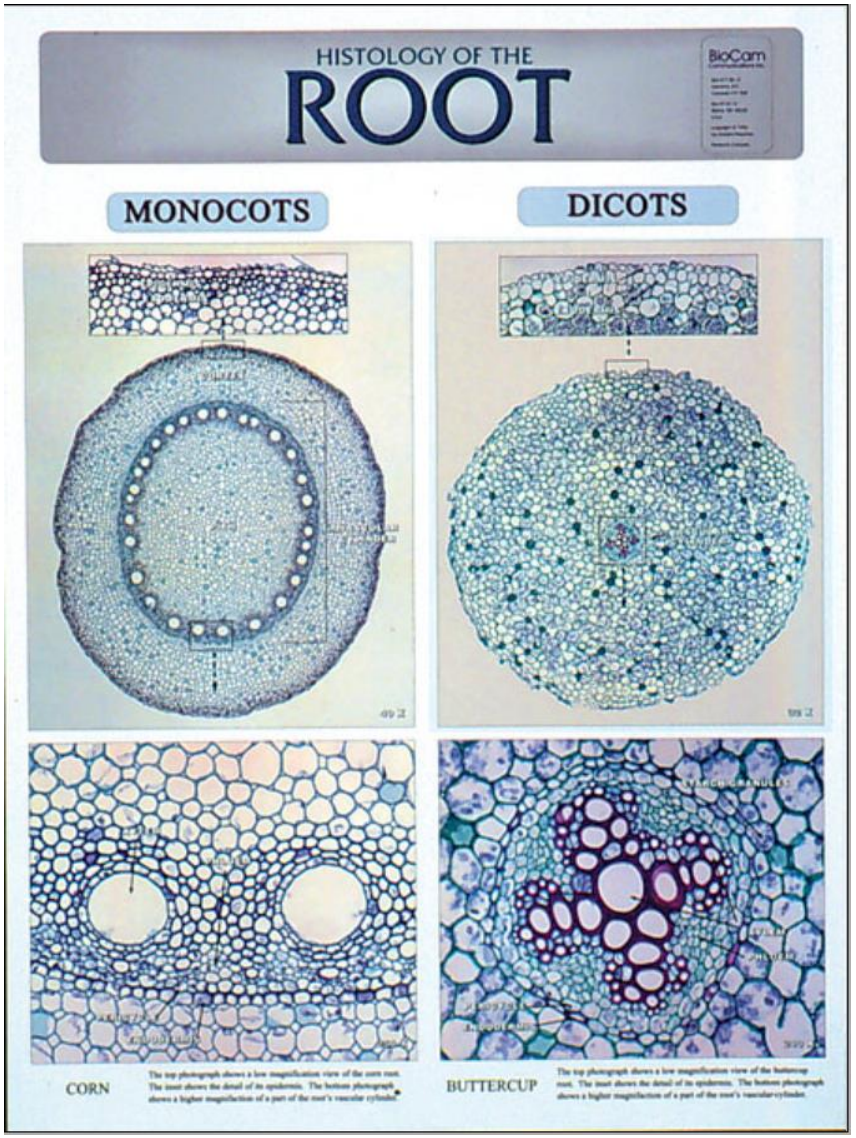

LILY
LIFE CYCLE
BioCam
Pollen Grain
2. Anther Cross Section x 180
Ovule
3. Ovary Cross Section x 42
1. Lily flower
Anther
Filament
Stamen
Pistil
Petal
5. Ovary x 7
4. Pollen tube
x 720
Pollen grains

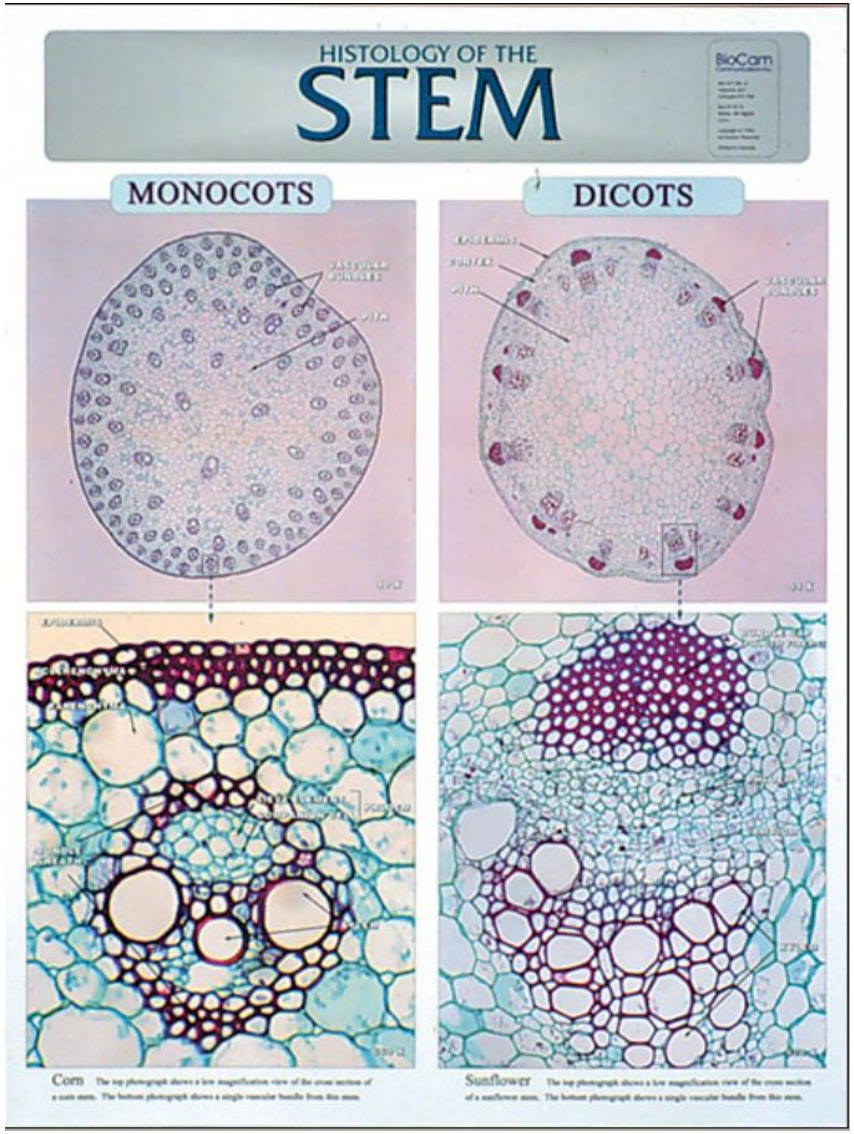

The Flower
Pollen
Pollen
Stamen
Filament
Anther
Petal
Stigma
Carpal
Style
Ovary
Sepal
Receptacle
Pollen Tube
Antipodal Cells
Ovary
Ovule
Polar Nuclei
Egg
Synergid Cells
Micropyle
Sperm Cells
The illustration shows an idealized flower. The wide range of floral diversity can be seen in the Biocam Chart Floral Diversity
BioCam

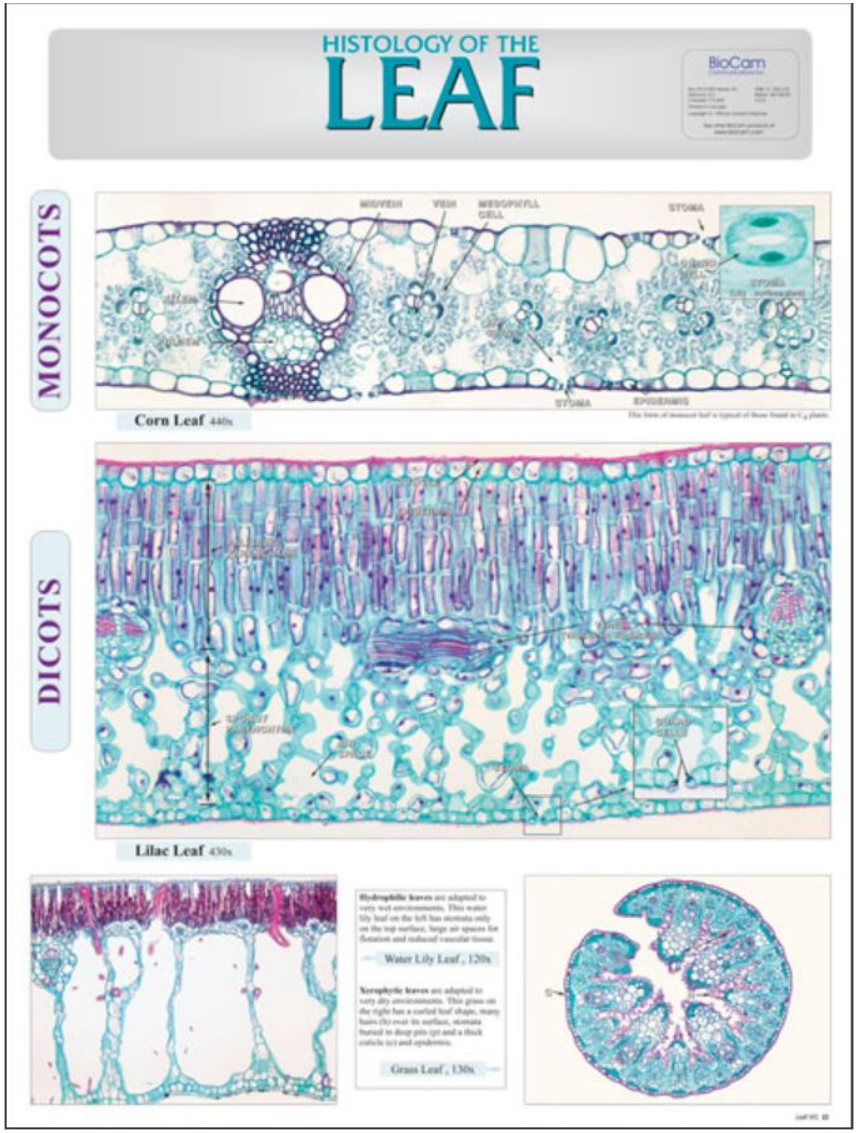

Imperfect Flowers
Complete Flower
Lily
FLORAL DIVERSITY
Orchids
Composites
Spadix
Catkin
Poinsettia
Grasses
Corn


Berry
Hesperidium
FLESHY FRUITS
Pepo
Drupe
Pome
Aggregate
Accessory
Multiple


Achene
Samara
Caryopsis
Nut
Schizocarp
DRY FRUITS
Follicle
Legume
Loment
Capsule
Silicle
Silique


HISTOLOGY OF THE
ROOT
BioCam
MONOCOTS
DICOTS
CORN
BUTTERCUP


HISTOLOGY OF THE
STEM
BioCam
MONOCOTS
DICOTS
Corn The top photograph shows a low magnification view of the cross section of a corn stem. The bottom photograph shows a single vascular bundle from this stem.
Sunflower The top photograph shows a low magnification view of the cross section of a sunflower stem. The bottom photograph shows a single vascular bundle from this stem.

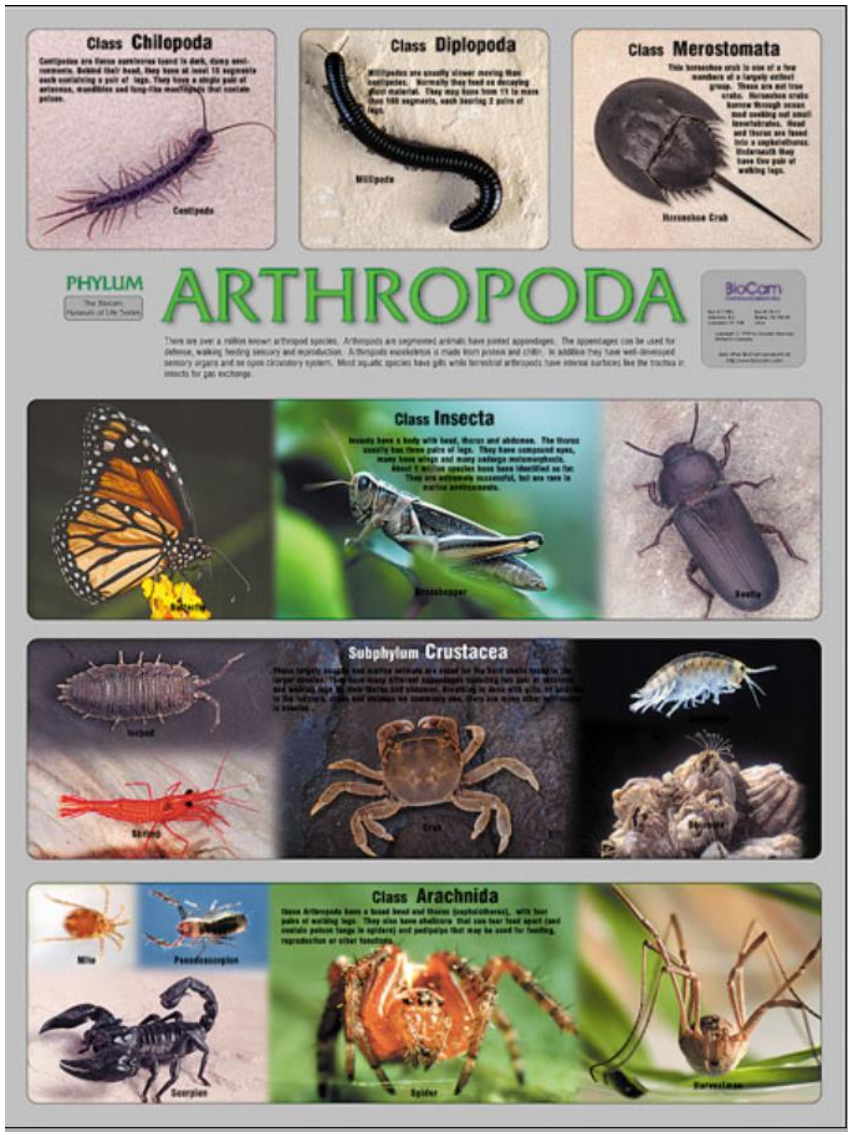

HISTOLOGY OF THE
LEAF
BioCam
MONOCOTS
DICOTS
Corn Leaf 440x
Lilac Leaf 430x
Hydrophilic leaves are adapted to very wet environments. This water lily leaf on the left has stomata only on the top surface, large air spaces for flotation and reduced vascular tissue.
Water Lily Leaf , 120x
Xerophytic leaves are adapted to very dry environments. This grass on the right has a curled leaf shape, many hairs (h) over its surface, stomata buried in deep pits (pt) and a thick cuticle (c) and epidermis.
Grass Leaf , 130x

PHYLUM
PORIFERA
Bath Sponge
Glass Sponge Skeleton
2. water is released through the opening or osculum
1. food particles are filtered out of the water by cells in the walls of sponges
BioCam
Boring Sponge
(bores into rock and shells)
Red Fan Sponge
Vase Sponge
Sponges are found in a great variety of shapes and colors. They may encrust over surfaces, burrow into rock, they may be tube-like, urnlike or goblet like. Many have irregular shaped, or string like. Most sponges belong to the class demospongia, and most are marine.
Finger Sponge
Encrusting Sponge
on scallop
Tube Sponge

Class Hydrozoa
Colonial Hydrozoan - Obelia
Freshwater Polyp - Hydra
Hydromedusa - Polyorchis
Siphonophore - Portuguese Man-of-War
PHYLUM
CNIDARIA
BioCam
Cnidarians include corals, hydras, sea anemones, and jellyfish. They are mostly marine. Their basic body plan is sac-like with a single opening that functions as both mouth and anus. Usually when a cnidarian is attached, it is termed a polyp, and when free-swimming, a medusa. Some exist only as a polyp or as a medusa, and some have both forms during their life. Around the mouth are tentacles containing stinging capsules (the nematocysts). Cnidarians have two living layers of tissue (epidermis and gastrodermis) separated by a non-living layer (mesoglea).
Class Scyphozoa
Ephyra
Moon Jellyfish
Mangrove Jellyfish
Class Anthozoa
Polyps
polyp
Cup Coral
Sea Fan
Sea Anemone


Class Bivalvia
Cockle
Clam
PHYLUM
MOLLUSCA
BioCam
Mangrove Jellyfish
Mangrove Jellyfish
Class
Gastropoda
Mangrove Jellyfish
Class Cephalopoda
Class Polyplacophora
Class Scaphopoda

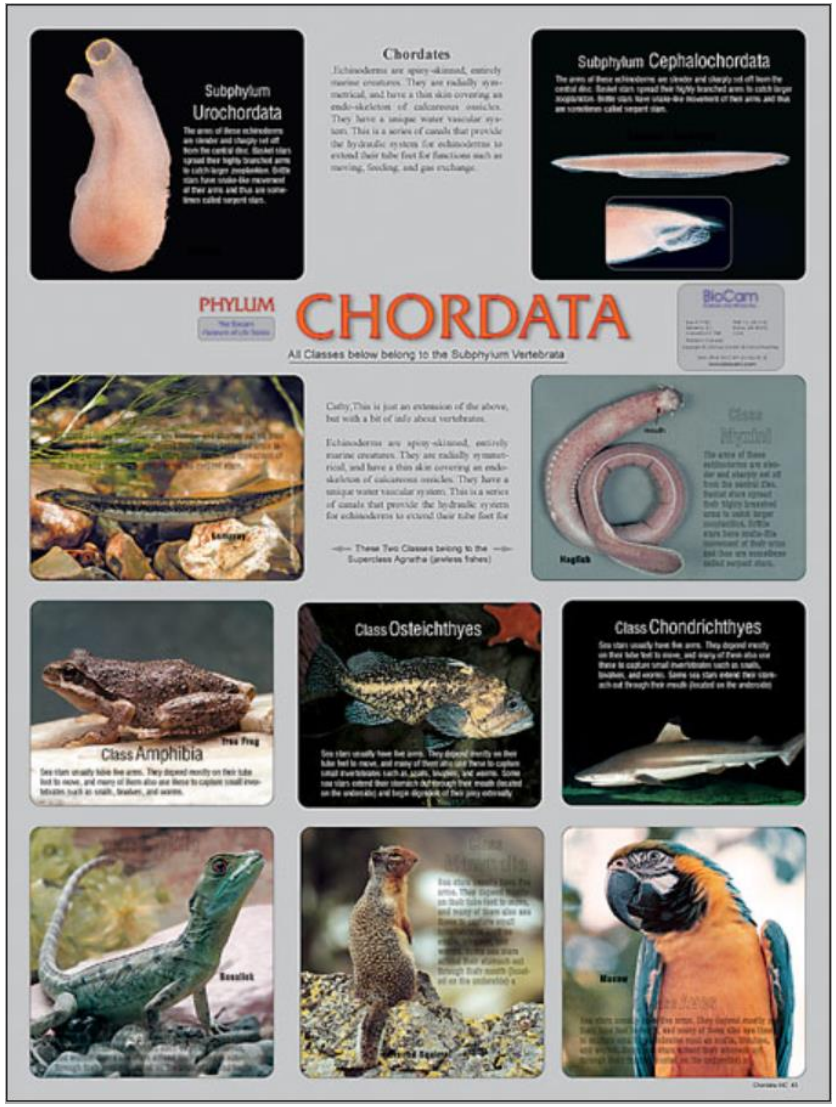

Class
Holothuroidea
Sea Cucumbers
Class Crinoidea
Feather Star
PHYLUM
ECHINODERMATA
BioCam
Class Asteroidea
Sea Stars
Brittle Star
Basket Star
Class Ophiuroidea
Sand Dollar
Sea Urchin
Class Echinoidea

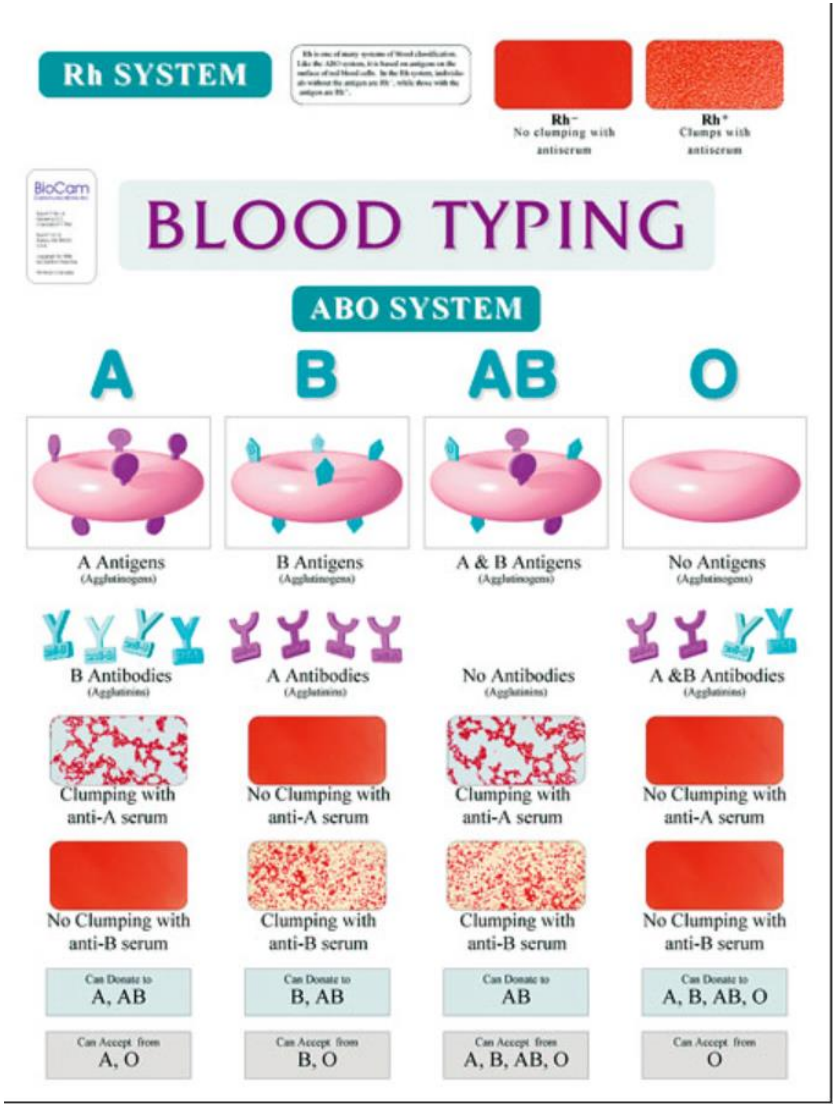

Class Chilopoda
Centipede
Class Diplopoda
Millipede
Class Merostomata
Horseshoe Crab
PHYLUM
ARTHROPODA
Class Insecta
Subphylum Crustacea
Class Arachnida
Mite
Pseudoscorpion
Scorpion
Spider

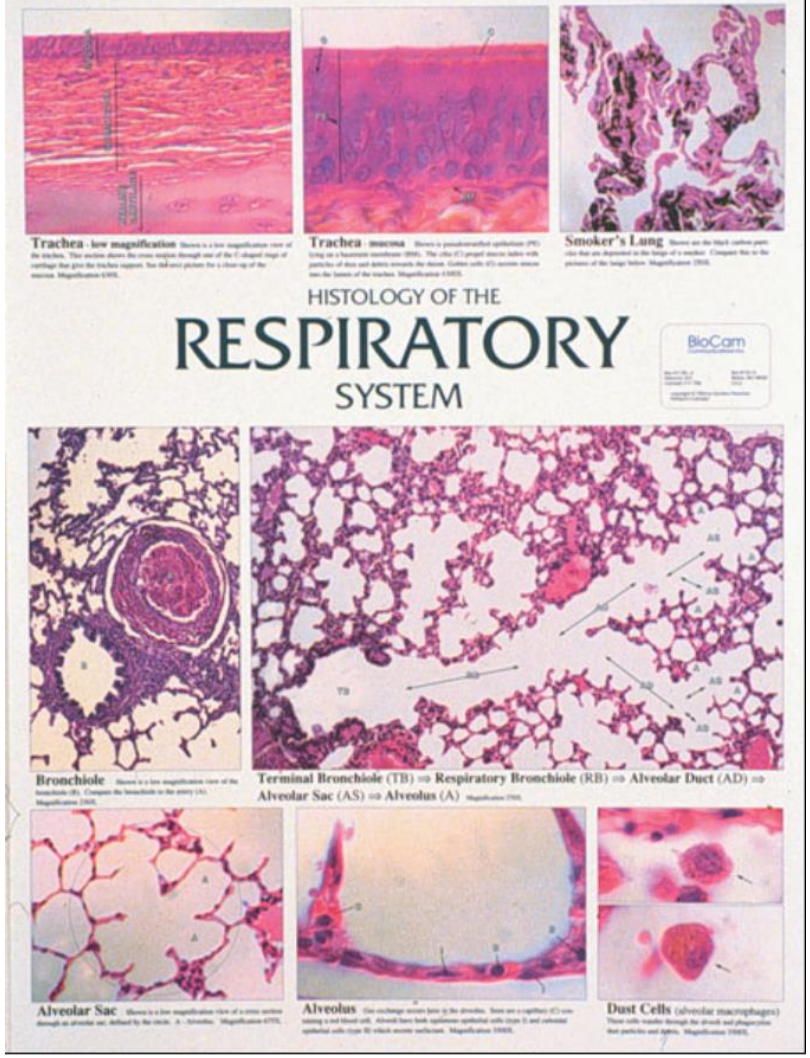

Class Trematoda
Sheep Liver Fluke x 3
Chinese Liver Fluke x 15
Class Monogenea
PHYLUM
PLATYHELMINTHES
Class Cestoidea
Class Turbellaria
Marine Turbellarian x 11
Aquatic Turbellarian
Marine Turbellarian x 2

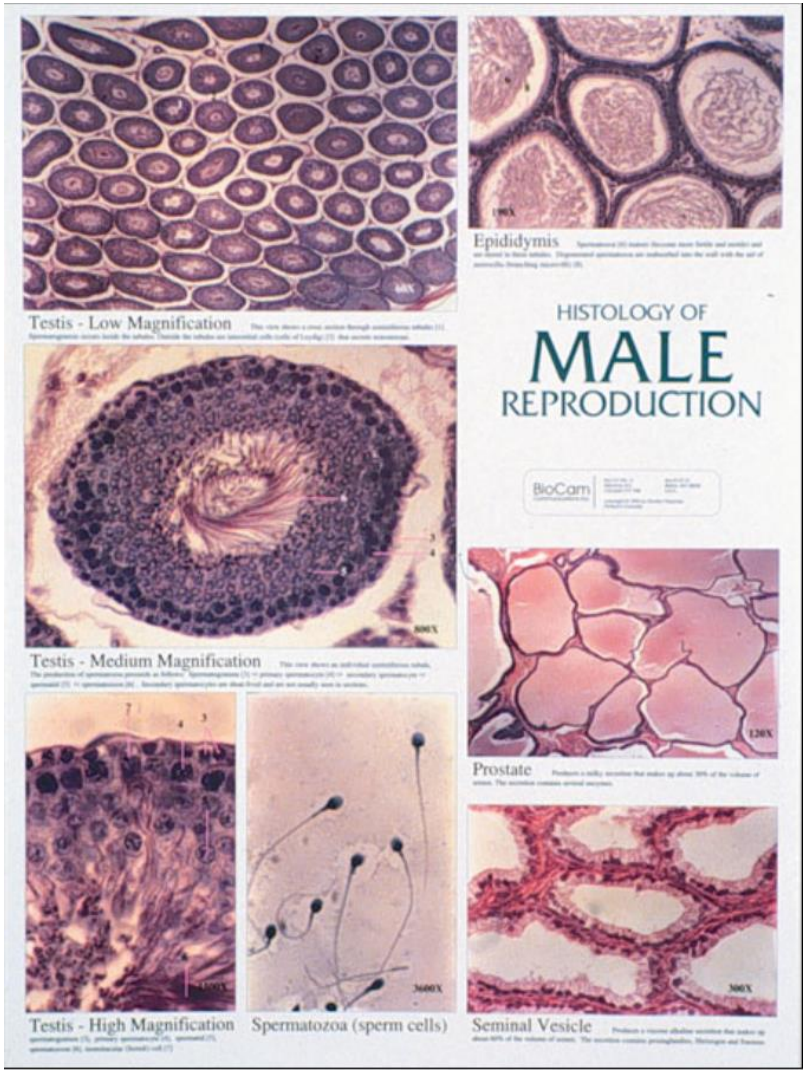

Model Organism
C. Elegans
This organism, Caenorhabditis elegans. Much of what we know about genetics and development in cause this is a model organism.
Marine Nematodes
PHYLUM
NEMATODA
In addition to general things I want to say here that most nematodes aren't parasites. I just have them on the poster because they are all that was available. In addition to general things I want to say here that most nematodes aren't parasites. I just have them on the poster because they are all that was available. In addition to general things I want to say here that most nematodes aren't parasites. I just have them on the poster because they are all that was available.
BioCam
Ascaris
Thought maybe a blurb here about disease of ascaris here. Adult male and female ascaris are shown life-size.
The Ubiquitous Nematode
Trichinosis
Dog Heartworm
Ascaris Section
Intestine
Uterus
Pinworm
Hookworm

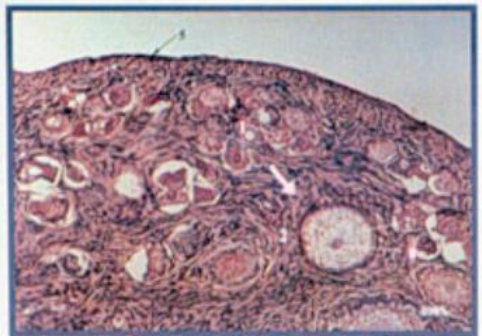

Earthworm - Lumbricus
Class Oligochaeta
Freshwater Stylaria X999
Freshwater Aeloscena d999
Tubifex
PHYLUM
ANNELIDA
Echinoderms are spiny-skinned, entirely marine creatures. They are radially symmetrical, and have a thin skin covering an endo-skeleton of calcareous ossicles. They have a unique water vascular system. This is a series of canals that provide the hydraulic system for echinoderms to extend their tube feet for functions such as moving, feeding, and gas exchange.
BioCam
Class Polychaeta
Lugworm
Nereis
Scale Worm
Terebelid Worm
Calcareous Tube Worms on shell
Feather Duster Worm
extended and retracted
Class Hirudinea
Fresh Water Leeches

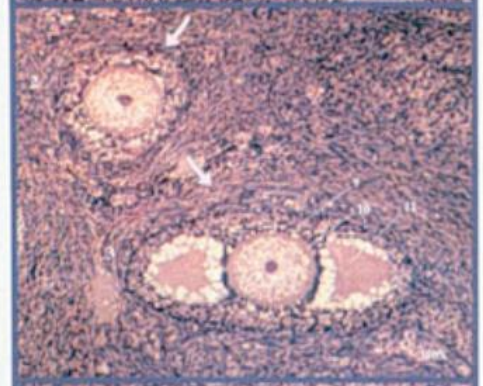

Subphylum
Urochordata
Chordates
Subphylum Cephalochordata
PHYLUM
CHORDATA
All Classes below belong to the Subphylum Vertebrata
BioCam
Class Amphibia
Class Osteichthyes
Class Chondrichthyes


Rh SYSTEM
Rh⁻
No clumping with antiserum
Rh⁺
Clumps with antiserum
BioCam
BLOOD TYPING
ABO SYSTEM
A
B
AB
O
A Antigens
(Agglutinogens)
B Antigens
(Agglutinogens)
A & B Antigens
(Agglutinogens)
No Antigens
(Agglutinogens)
B Antibodies
(Agglutinins)
A Antibodies
(Agglutinins)
No Antibodies
(Agglutinins)
A &B Antibodies
(Agglutinins)
Clumping with anti-A serum
No Clumping with anti-A serum
Clumping with anti-A serum
No Clumping with anti-A serum
No Clumping with anti-B serum
Clumping with anti-B serum
Clumping with anti-B serum
No Clumping with anti-B serum
Can Donate to
A, AB
Can Donate to
B, AB
Can Donate to
AB
Can Donate to
A, B, AB, O
Can Accept from
A, O
Can Accept from
B, O
Can Accept from
A, B, AB, O
Can Accept from
O


Trachea - low magnification
Trachea - mucosa
Smoker's Lung
HISTOLOGY OF THE
RESPIRATORY
SYSTEM
BioCam
Bronchiole
Terminal Bronchiole (TB) ⇒ Respiratory Bronchiole (RB) ⇒ Alveolar Duct (AD) ⇒ Alveolar Sac (AS) ⇒ Alveolus (A)
Alveolar Sac
Alveolus
Dust Cells (alveolar macrophages)

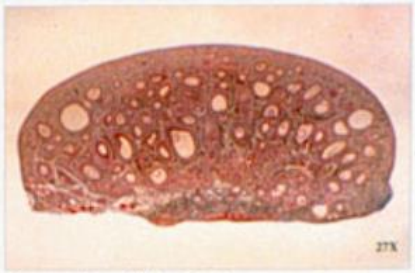

Testis - Low Magnification
Epididymis
HISTOLOGY OF
MALE
REPRODUCTION
BioCam
Testis - Medium Magnification
Prostate
Testis - High Magnification
Spermatozoa (sperm cells)
Seminal Vesicle





Ovary - Developing Follicles

Ovaries contain many follicles at various stages of development. A follicle consists of an oocyte (immature egg) and surrounding cells. Each month a few **primordial follicles** respond to FSH and begin their development into **primary follicles**. The oocyte enlarges and the cells forming the follicle both enlarge and multiply. Later, in the **secondary follicle**, a cavity (the antrum) forms around the oocyte. The final stage is the **vesicular** or **Graafian follicle**. This large follicle pushes to the side of the ovary and the oocyte is released to the uterine (fallopian) tube. Not all follicles that start to develop will reach this final stage.



Ovary - Low Magnification

This view shows an ovary with follicles at different stages of development. Ovary is from a small mammal.

HISTOLOGY OF FEMALE REPRODUCTION

BioCam

1. Primordial follicle
2. Primary follicle
3. Secondary follicle
4. Vesicular (Graafian) follicle
5. Germinal epithelium
6. Tunica albuginea
7. Oocyte
8. Nucleus
9. Granulosa cells
10. Zona pellucida
11. Antrum with follicular fluid
12. Corona radiata
13. Cumulus oophorus
14. Corpus luteum
15. Myometrium
16. Endometrium
    a. Stratum functionalis
    b. Stratum basalis

Uterine (Fallopian) Tube

The oocyte is released into this tube where fertilization occurs.

Corpus Luteum of ovary

After ovulation, the vesicular follicle forms the corpus luteum. The corpus luteum secretes progesterone and estrogen. Unless pregnancy occurs, it will degenerate after about 11 days.

Uterus

The wall of the uterus is where the embryo (blastocyst) will implant. If implantation does not occur, the outer layer of the endometrium is shed during menstruation.