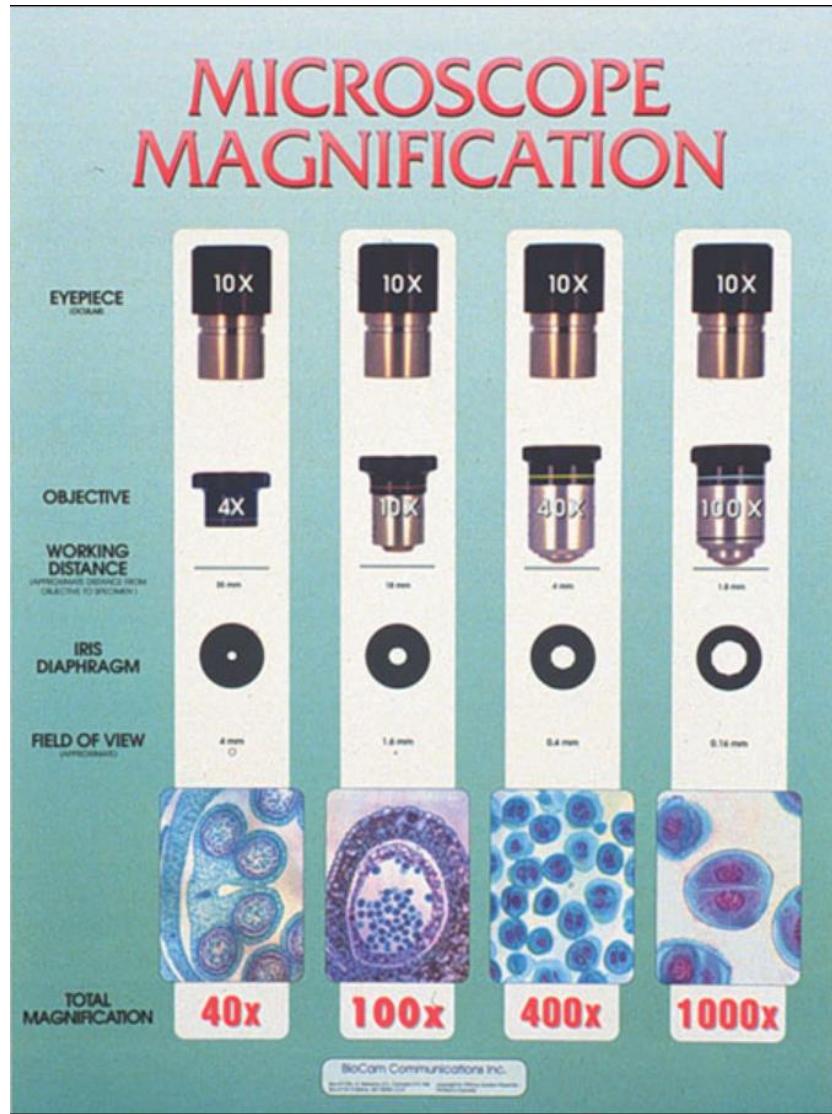
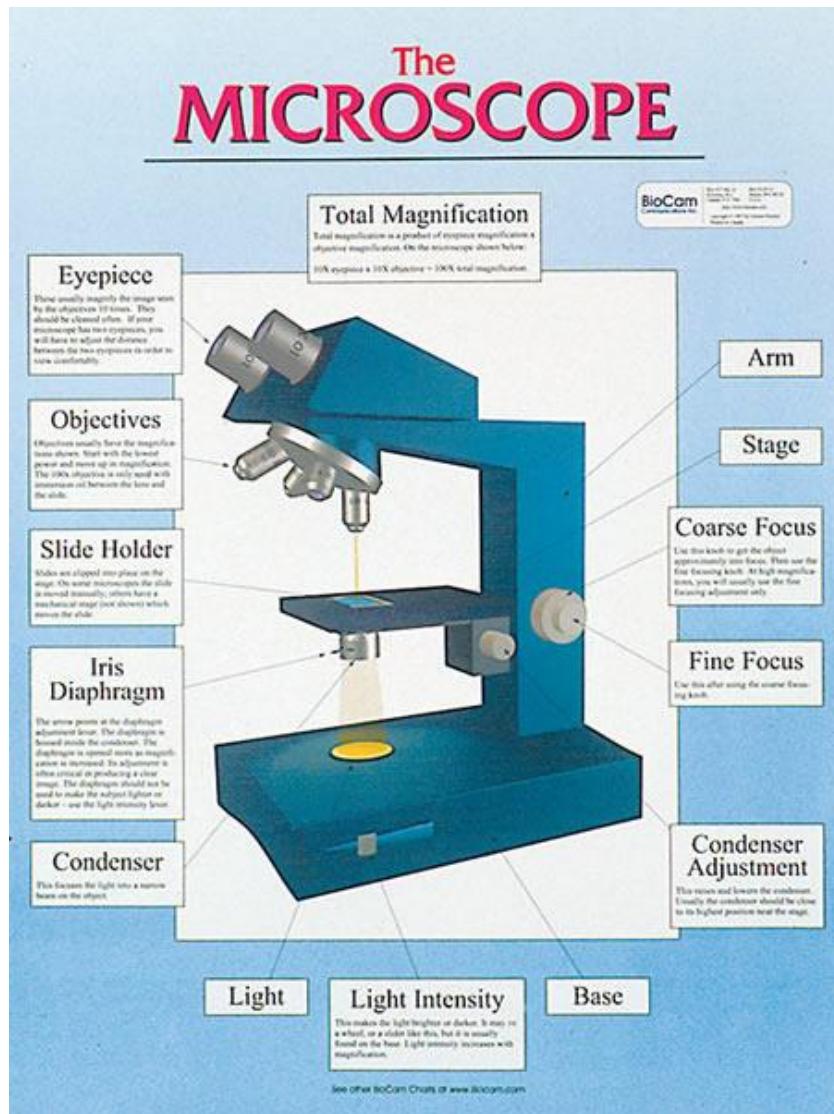
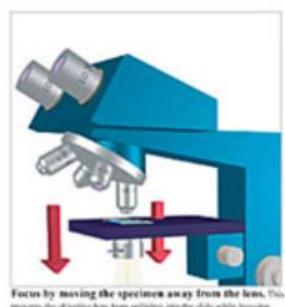
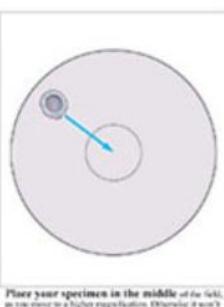


BSC2010L Posters - all posters courtesy of BioCam Charts. They may be accessed at:
http://www.biocam.com/Biocam_wall_charts_gallery.html





Focus by moving the specimen away from the lens. This prevents the objective lens from colliding into the slide while focusing.



Place your specimen in the middle of the field; as you move to a higher magnification, otherwise it won't appear at the higher magnification.



Focus by moving from the lowest power objective to the highest. This makes it much easier to find and focus on your specimen.

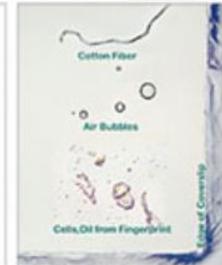
MICROSCOPE FOCUSING TIPS



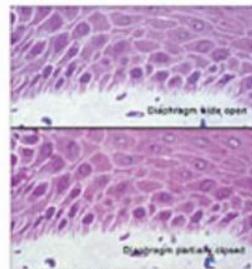
Dirt will impair your view. Dirt on the slide moves with the slide, dirt on the eyepiece will move with the eyepiece, dirt on the objective will not move and dirt on the condenser will appear to go away as you turn the condenser down/up.



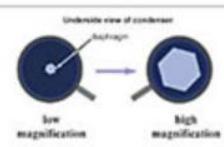
Slices that are sections are slices of three dimensional objects. Therefore, you need to interpret the circles, lines and ovals you see as letters, planes, rods, etc.



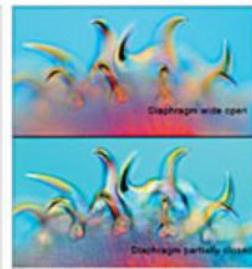
Don't mistake these for your specimen. The easiest way to know if you are looking at the right thing, is to have an idea what to expect before you start.



Closing the diaphragm increases contrast. These two images show the benefit of partially closing down the diaphragm. The top image shows less contrast and does not appear to be as sharp as the bottom image. However, closing the diaphragm too much will degrade the image.



As you increase magnification, the diaphragm should ideally be opened more, to give the best view of your specimen. A practical approach would be to do the following: While observing the specimen, open the diaphragm and then close it down slowly, until you find the best image.



In properly set the diaphragm, the condenser must be in the correct position. On most microscopes, this is near the highest position*. Use the iris diaphragm to control the amount of light. Use the light intensity control for this.

*The asterisk represents when a field stop is in the field you should adjust your microscope with proper mirror/interference techniques.



Rotifers
(*Phylum Rotifera*)



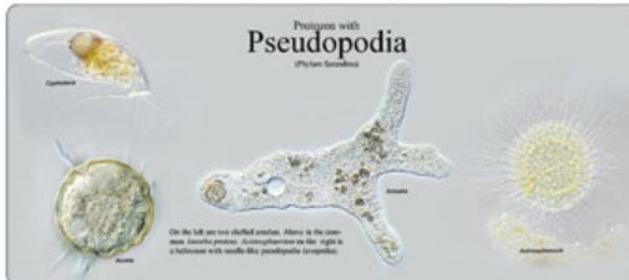
Nematodes
(*Phylum Nematoda*)



Miscellaneous

- Water Mite (*Phylum Arthropoda*)
- Water Bear (*Phylum Tardigrada*)
- Springtail (*Phylum Collembola*)

POND I SMALLER MICROLIFE



Protists with Pseudopodia

On the left are two ciliated amoebas. Above is the common amoeba process. Atmetaphorism on the right is a heterotrich with needle-like pseudopods (trichocysts).

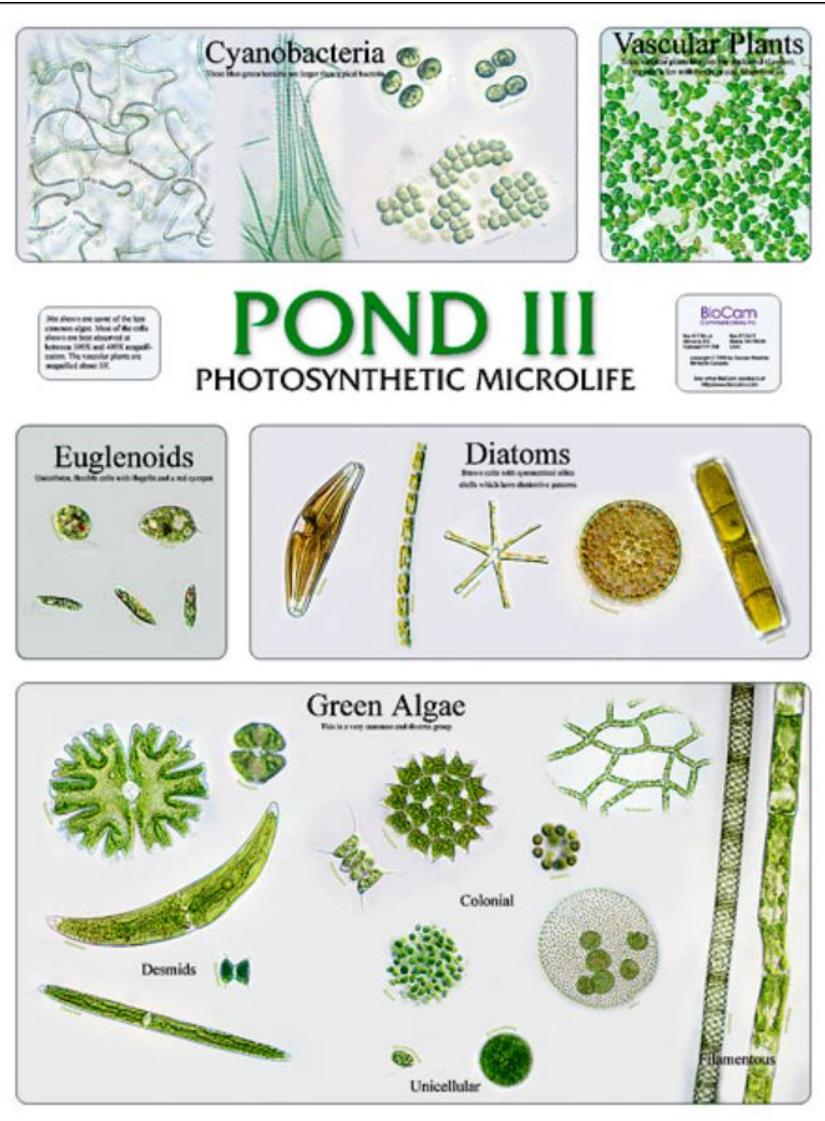
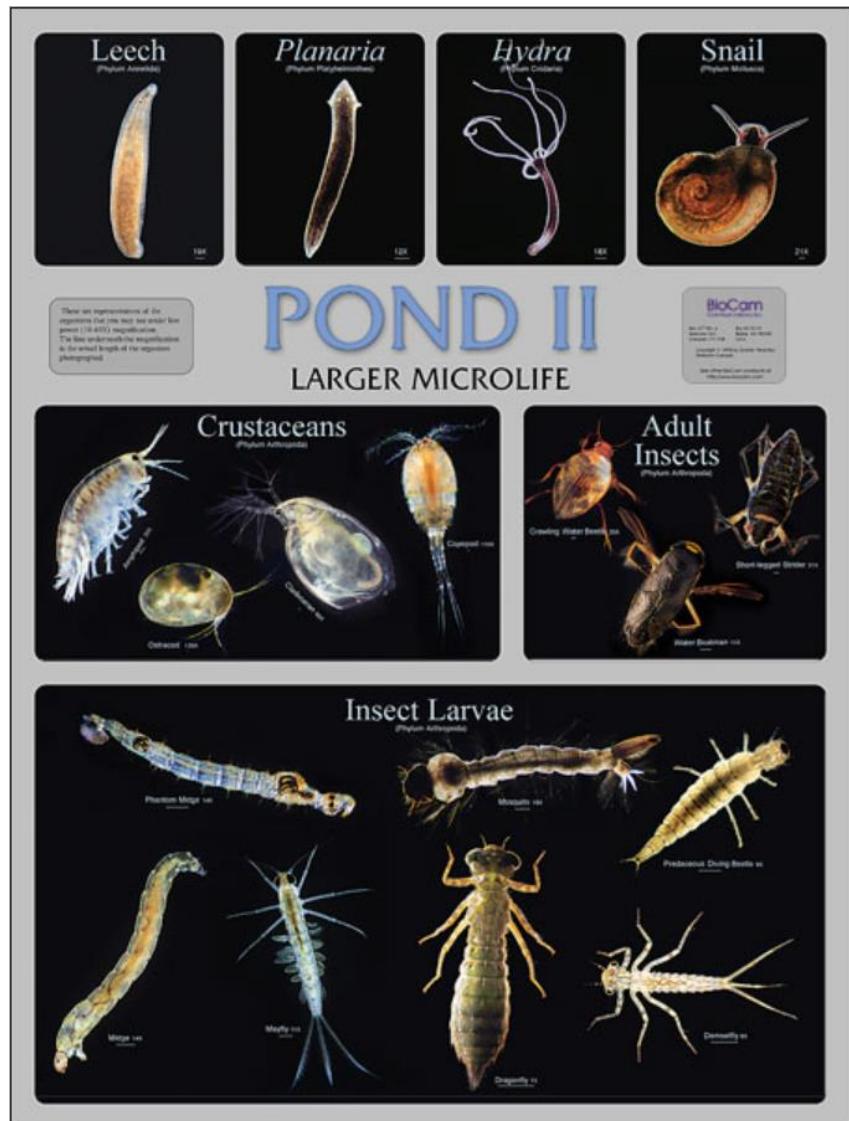


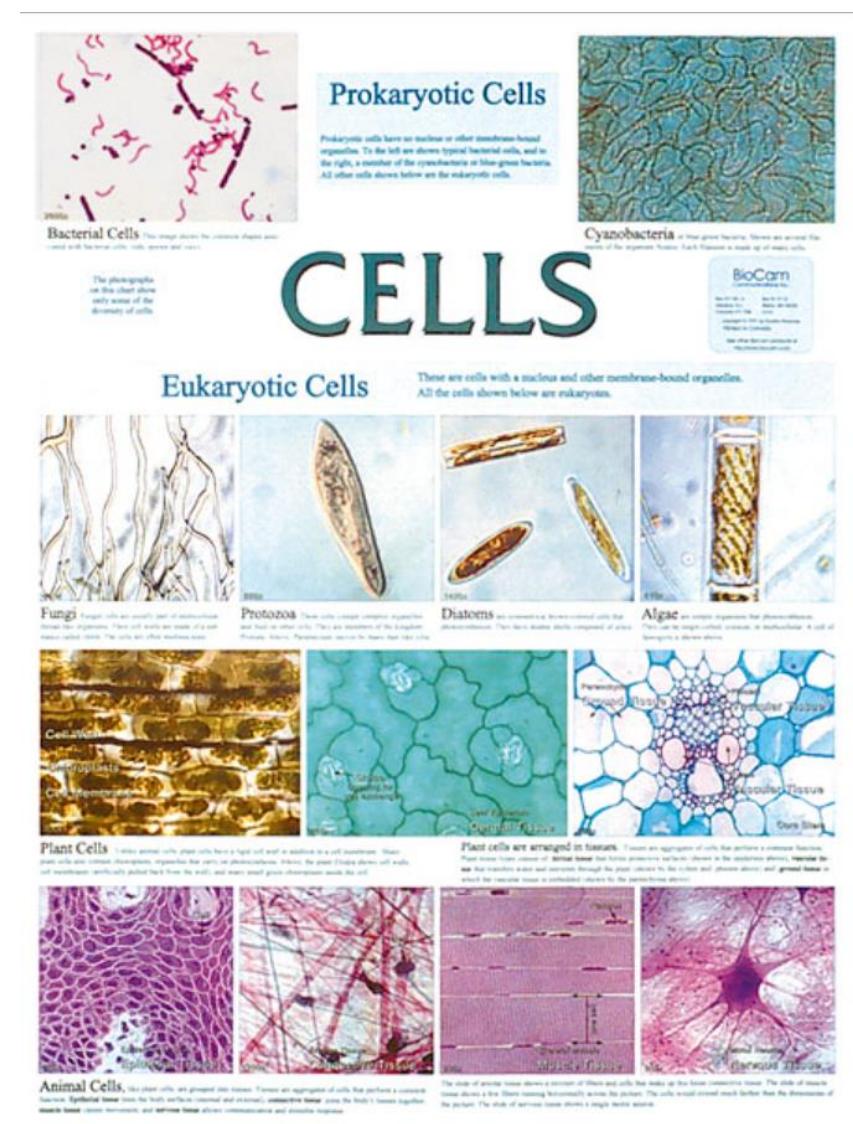
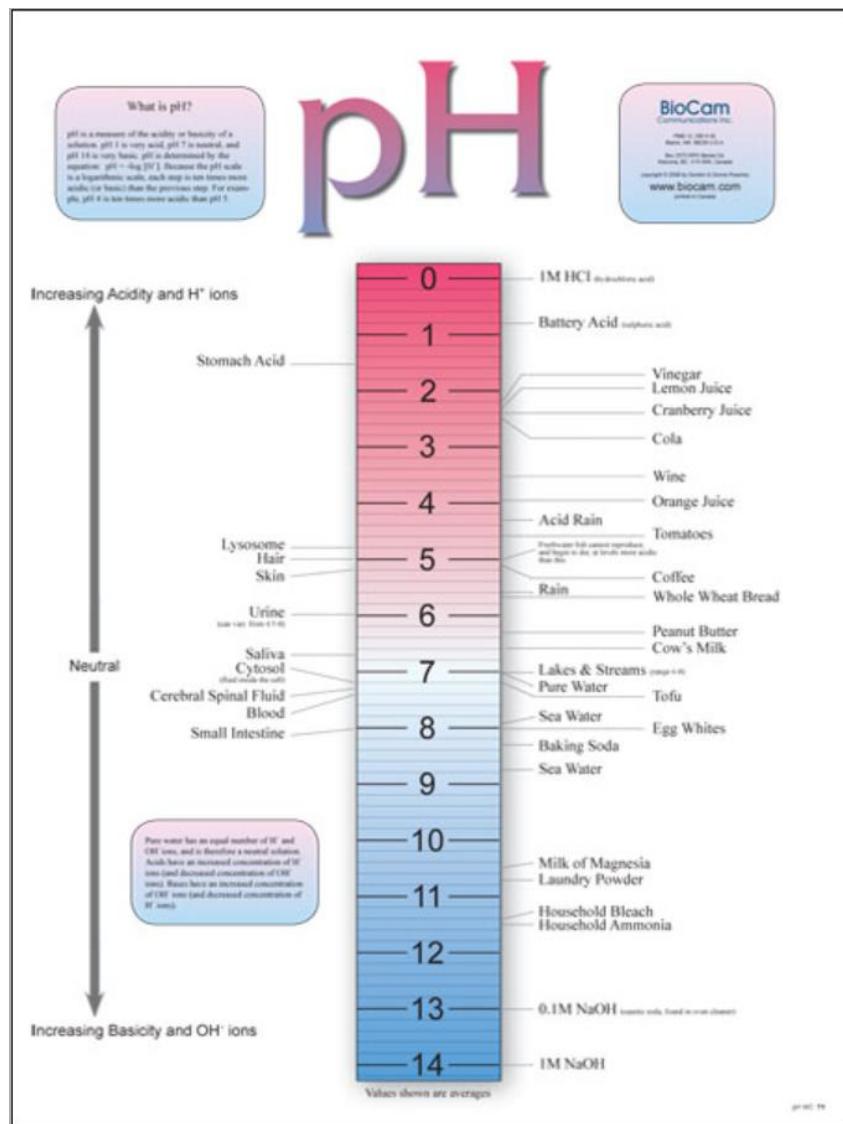
Protists with Flagella

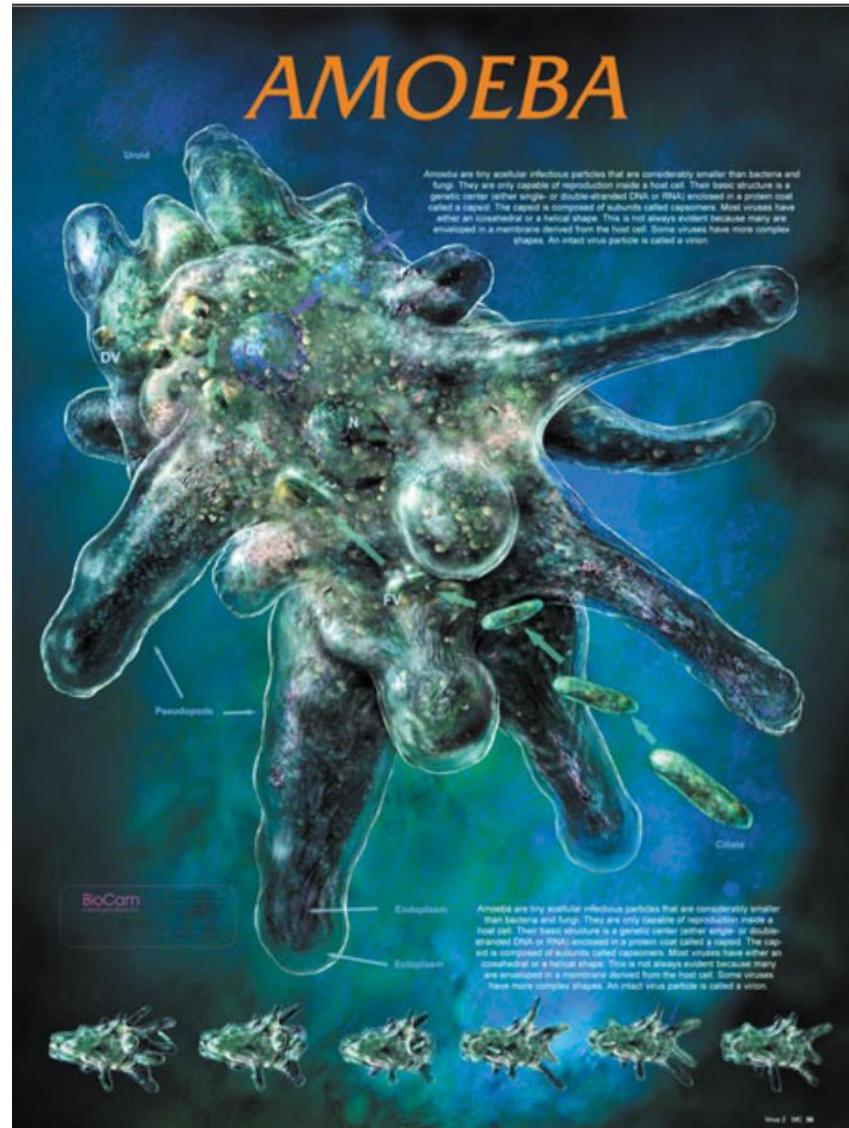
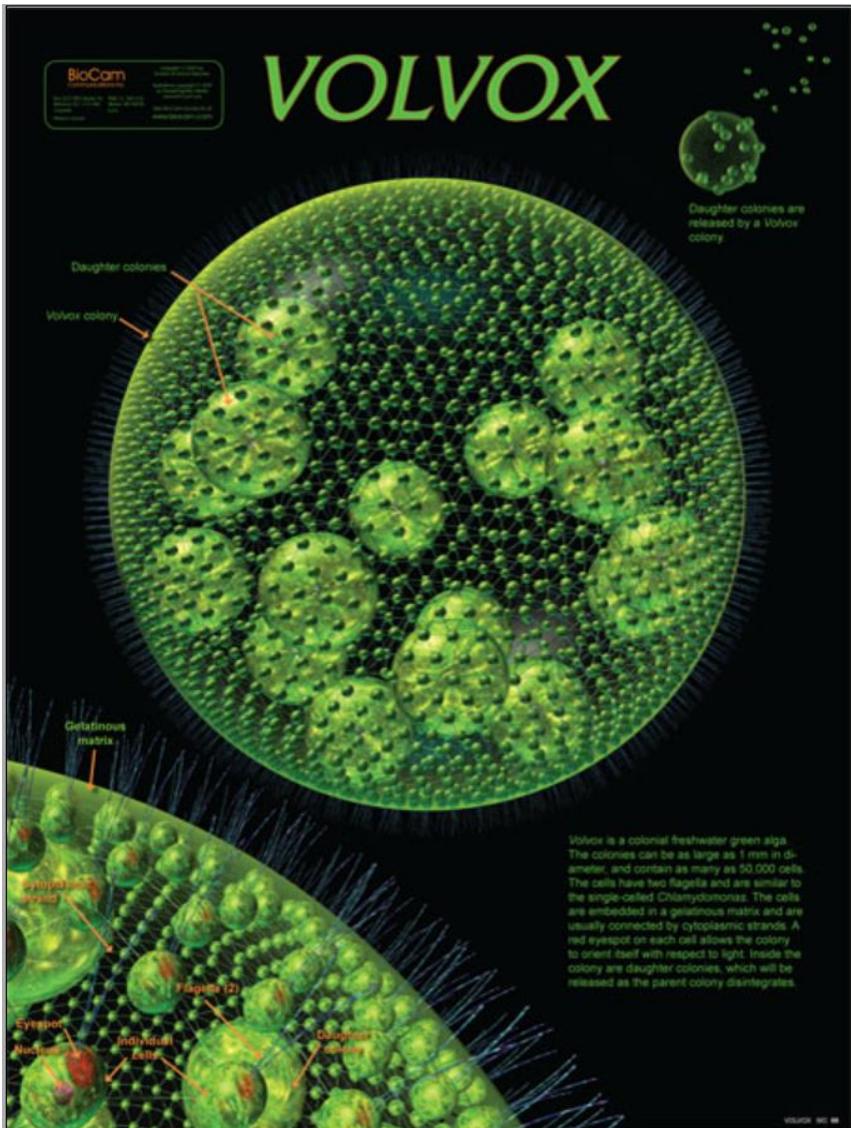


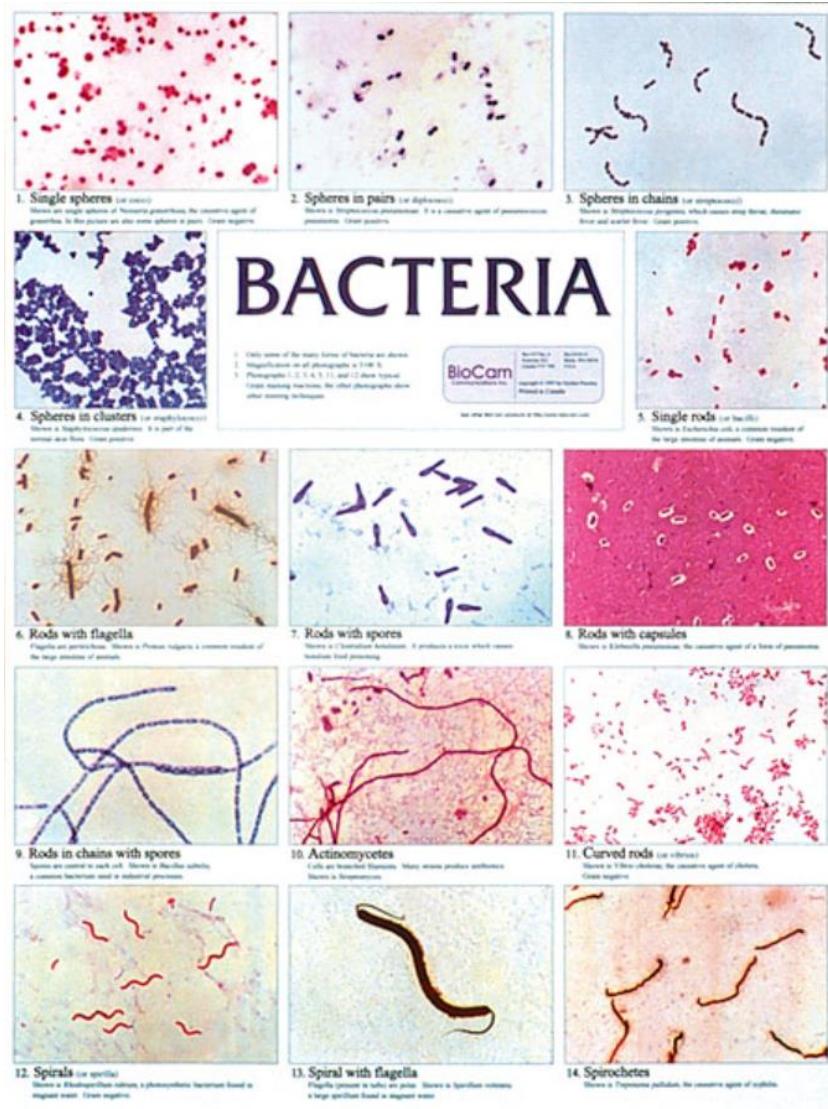
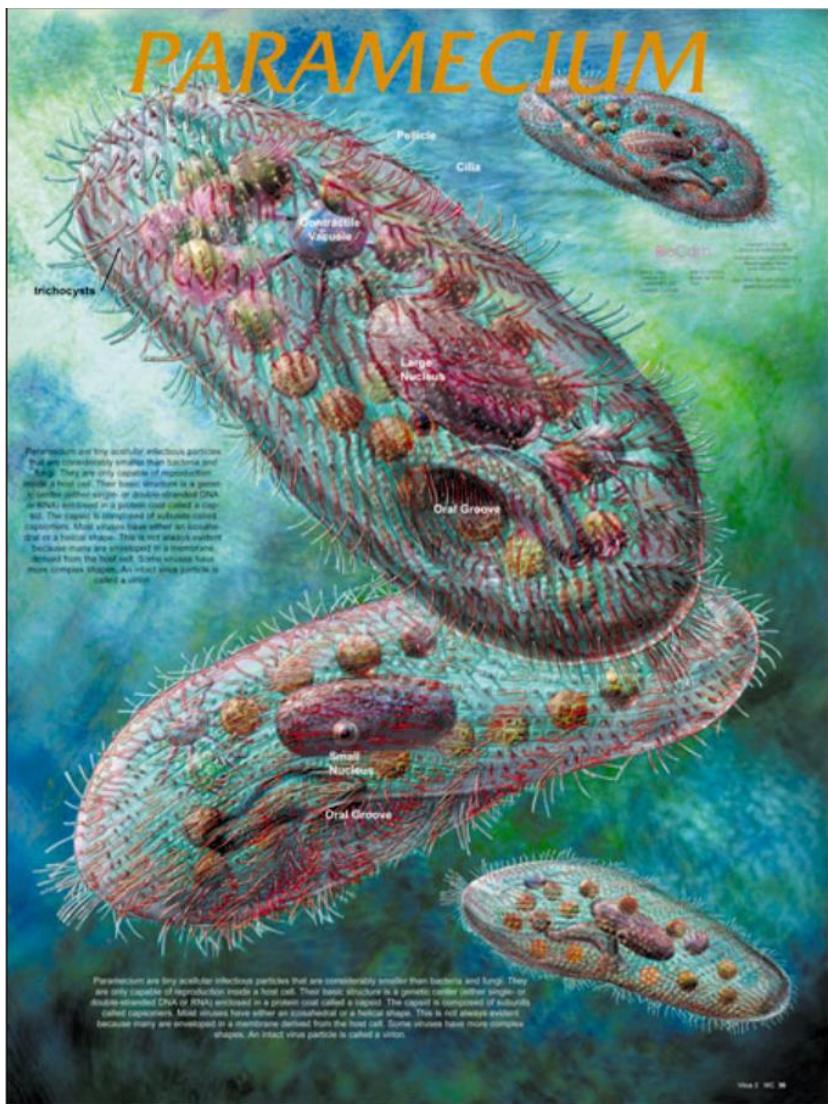
Protists with Cilia

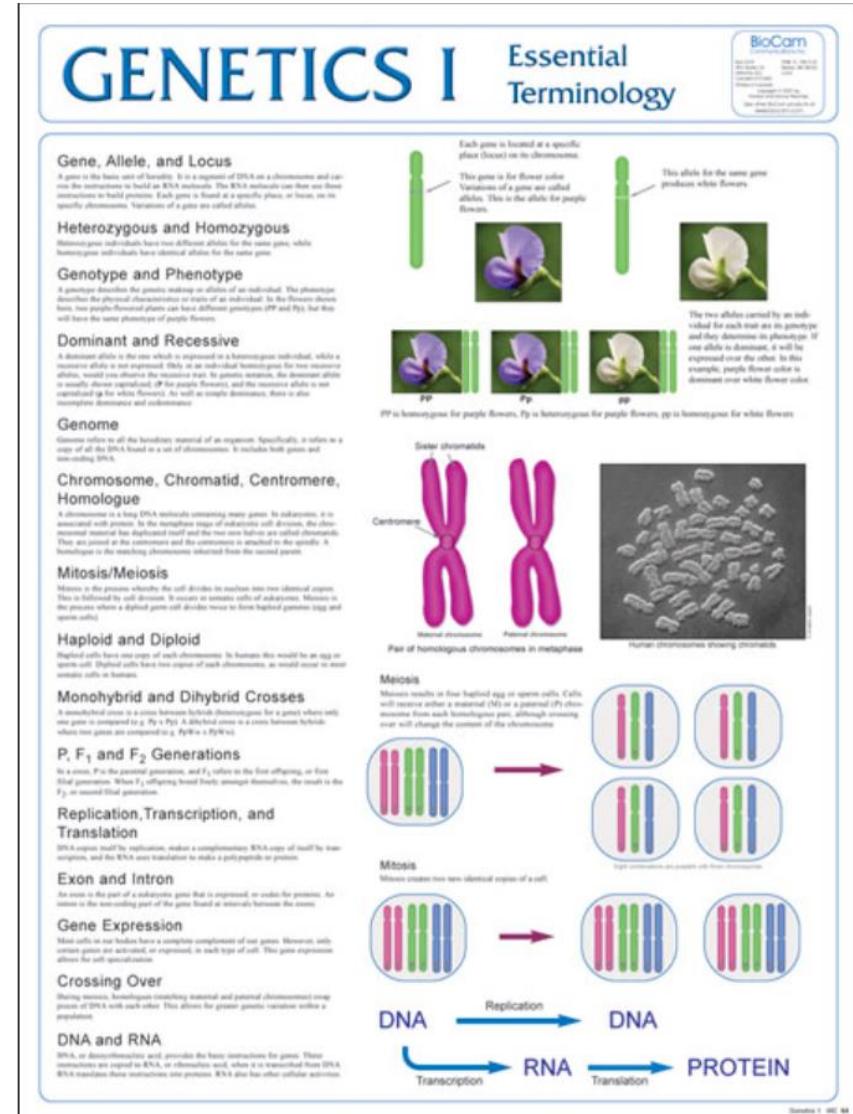
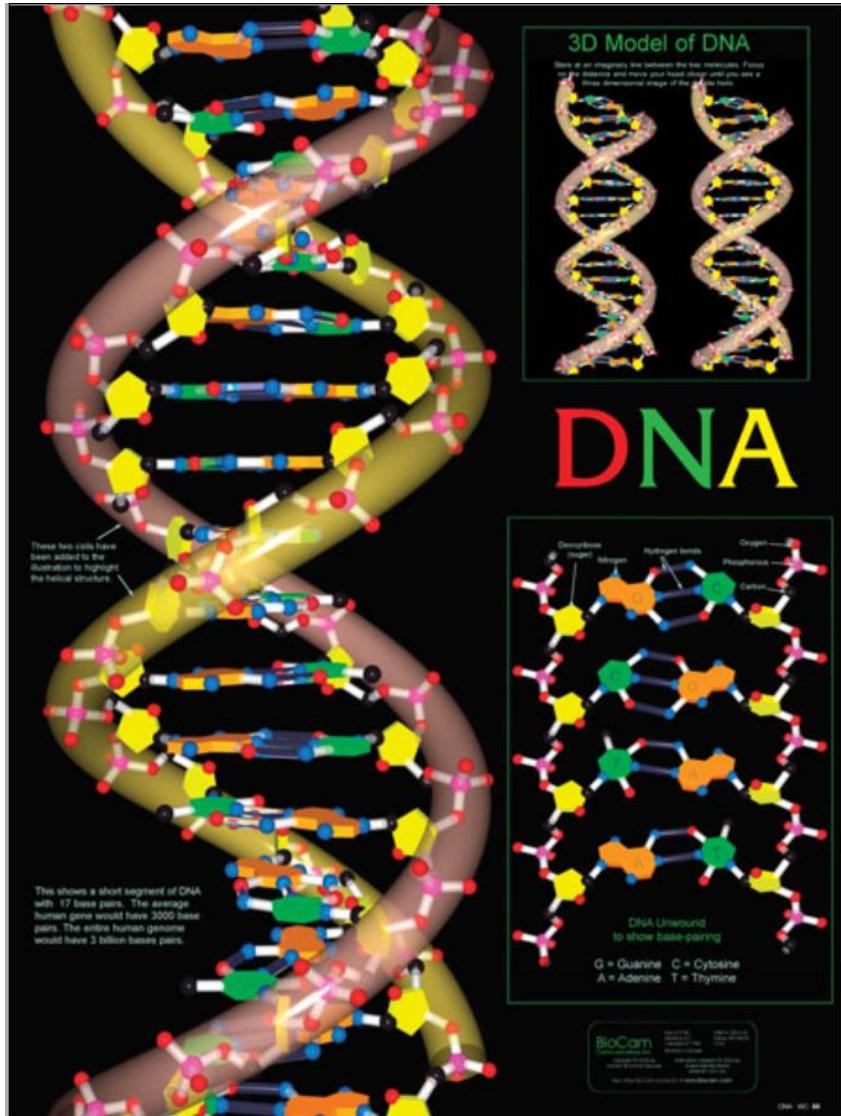










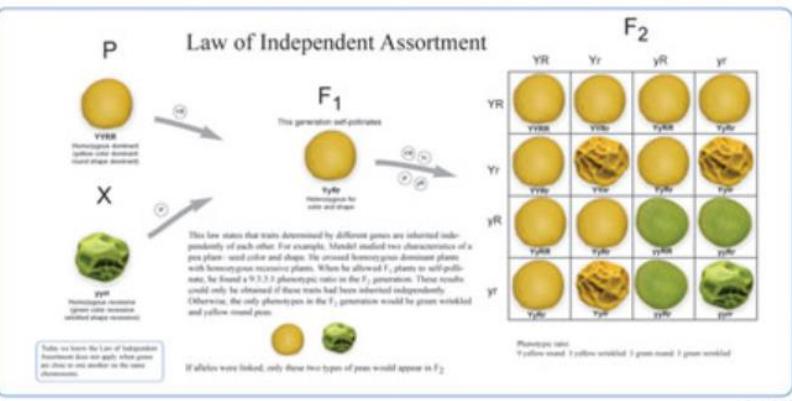
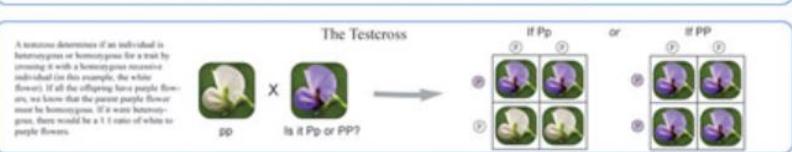
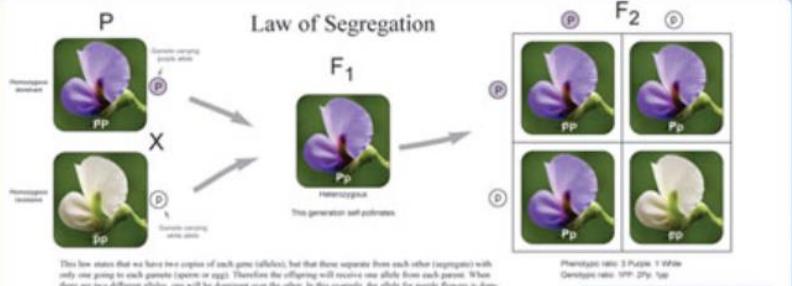


GENETICS II

Mendelian Genetics



In 1866 Gregor Mendel published his findings on genetics after eight years of studying 30,000 pea plants. Initially, his observations were mostly ignored. While there are exceptions to the principles he formulated, they still form the cornerstone of our modern knowledge of genetics.



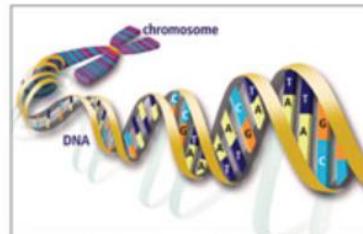
Genetics 2 pg. 66

GENETICS III

Human Genome

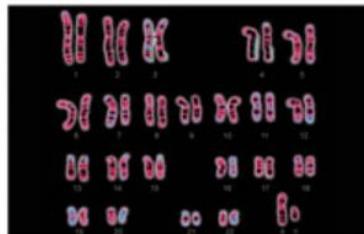


The human genome comprises three billion base pairs forming 20,000–25,000 genes located on 22 autosomal chromosomes and an X and a Y chromosome. Less than 2% of the genome codes for protein, with the remaining DNA often referred to as junk DNA.



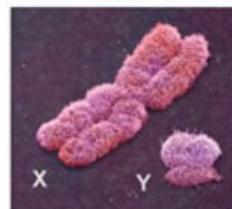
The Genome is made up of DNA

Chromosomes are composed of highly coiled and compacted molecules of DNA in association with protein molecules. During cell division the DNA molecule has to be unwound so that the genetic material can be distributed to all the DNA of a cell equally. Unwound and laid out in end, it would stretch to about 2 meters.



Human Karyotype

Humans have 23 pairs of autosomes plus two sex chromosomes, for a total of 46 chromosomes. Other species have different numbers of chromosomes. Mice have 40 chromosomes, while dogs have 30. The number of chromosomes can be easily determined by looking at the chromosomes stained and arranged in pairs of size. The karyotype can be used to find chromosomal abnormalities.



Sex Chromosomes

Females have two X chromosomes, males have an X and a Y chromosome. A female's egg cell contains an X chromosome, while a male's sperm cell will have either an X or a Y chromosome. The Y chromosome contains fewer genes than the X chromosome.



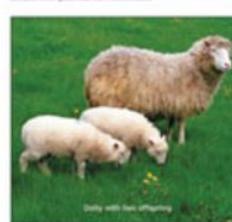
Mitochondrial DNA

Mitochondria have their own DNA, which is called mtDNA. It is similar to the DNA in the cell nucleus, but it is passed down from the cytoplasm of the mother's egg, and not from the sperm cell. This is because all the genetic material in the cytoplasm is passed down through the egg cell.



How Many Genes?

The number of genes in prokaryotes (like E. coli) is considerably less than the number in eukaryotes. However, there is no obvious correlation between their complexity and gene-number. For example, the amoeba has more genes than the human.



Reproductive Cloning

In reproductive cloning, genetic material of an organism are made without sexual reproduction. An animal cell nucleus is removed from an egg cell and placed in an egg whose nucleus is removed. The egg is stimulated to make a begin dividing and is inserted in the uterus of a female who carries the embryo until birth. Dolly the sheep was the first mammal to be cloned, followed by cows, pigs, horses, and others. However, humans have not been cloned.



Human Genome Project

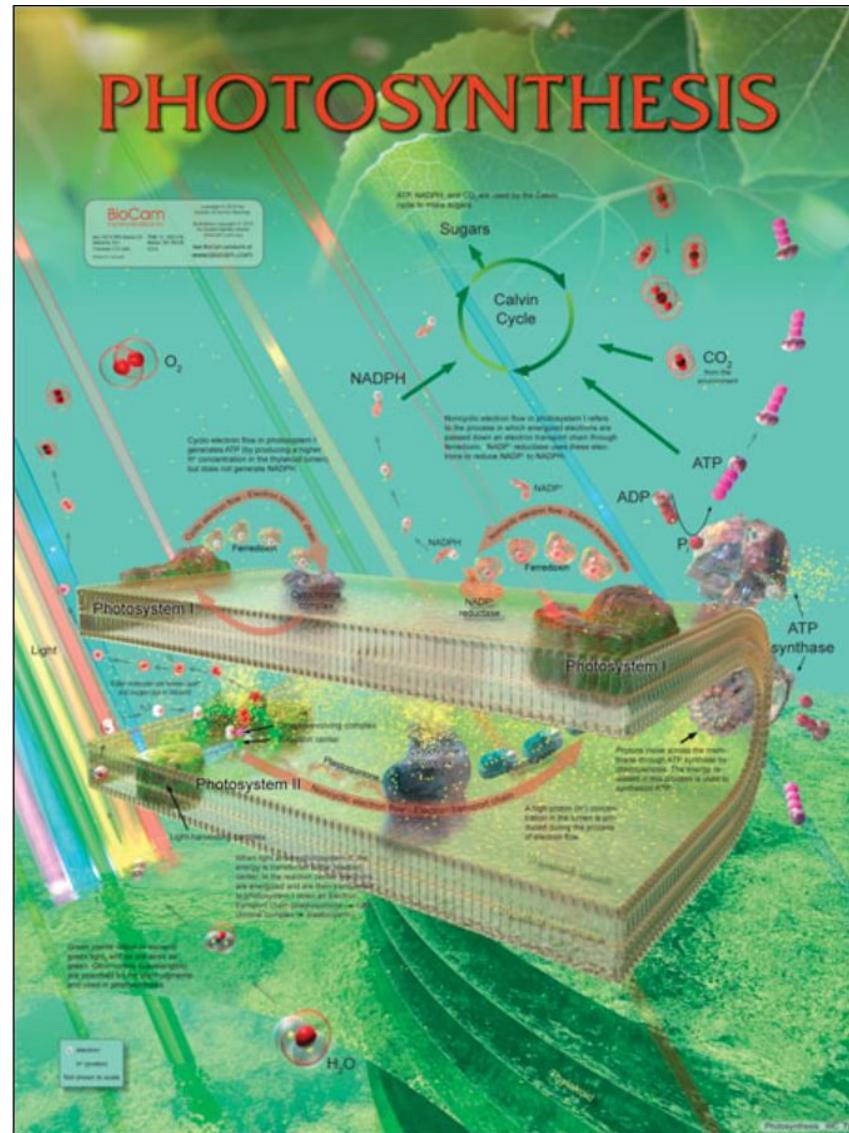
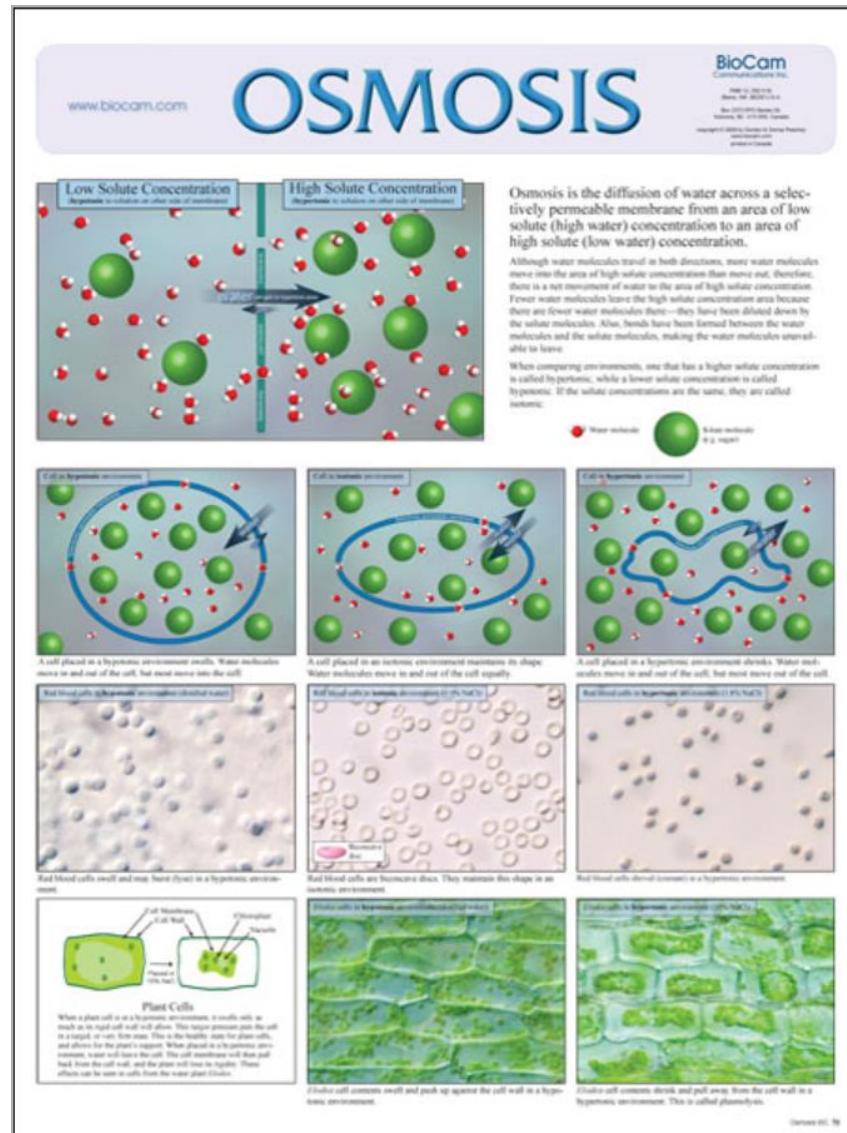
This huge project to map the human genome began in 1990 and was largely completed in 2003. The Human Genome Project was a scientific research project involving many countries. The main goal of the project was to produce a complete set of maps of all human chromosomes to identify all the genes and their locations on the chromosomes. This information can be used to find the genes that are responsible for causing specific diseases. It is immensely important. Surprisingly, it was discovered that we have far fewer genes than was previously believed.



Stem Cells

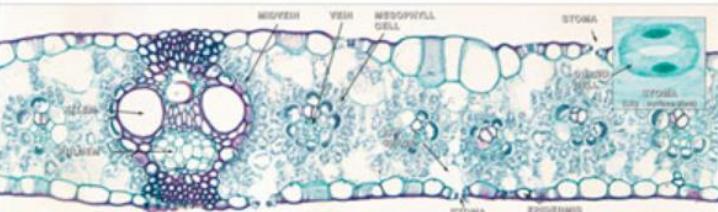
Although almost all cells in the body have the full complement of genes, most of these genes are not expressed. Some genes are expressed to produce only cells like fibroblasts. Stem cells have less genes turned off, and can be turned into many different types of cells. Embryonic stem cells do not have gender markers, and can be turned into either the XX or XY cell types in the body, producing various tissues.

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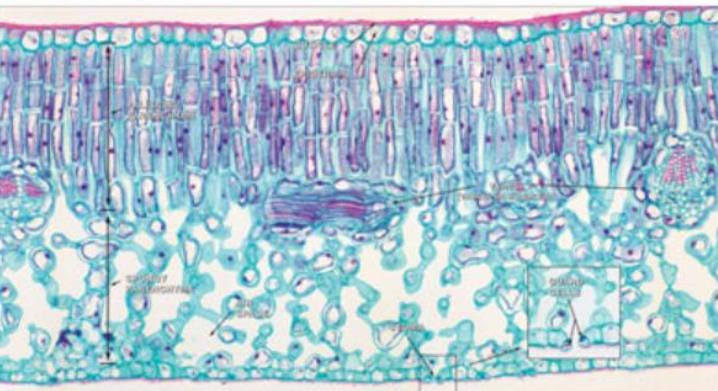
HISTOLOGY OF THE LEAF

MONOCOTS

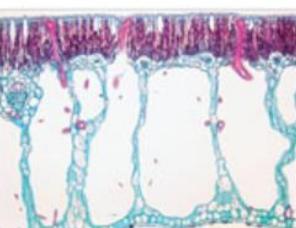


Corn Leaf, 400x

DICOTS



Lilac Leaf, 400x



Water Lily Leaf, 120x

Hydrophytic 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.



Grass Leaf, 130x

Grass leaves are adapted to very dry environments. This grass on the right has a curled leaf shape, many stomata (two on its surface), extensive branching in its pith and a thick cuticle on its epidermis.

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MITOSIS

Interphase



Animal Cell (Whitefish Bladder)

Plant Cell (Soybean Root Tip)

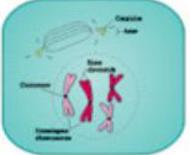
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The diagram of mitosis are of a cell with two pairs of chromosomes. (2n=2)

Photographs show cells magnified 1000 X.

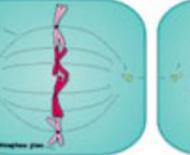
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1 Prophase



Chromosomes condense and become visible. The nuclear membrane and nucleolus disappear. A spindle apparatus begins to form at the centrosomes. The last pair of vesicles is also called pericentriolar.

2 Metaphase



Chromosomes align themselves in a plane which is perpendicular to the center of the spindle. This plate is called the metaphase plate.

3 Anaphase



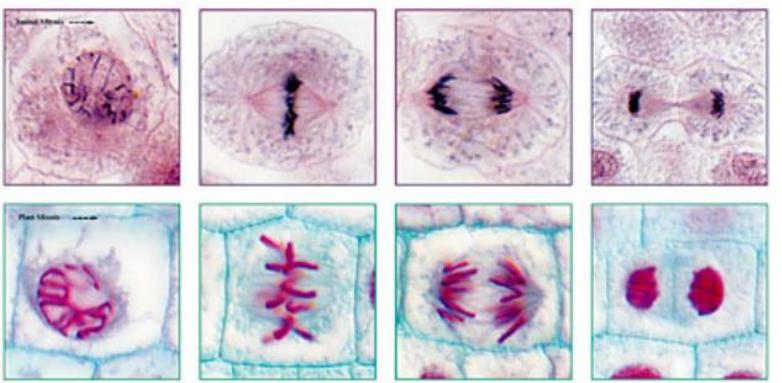
Sister chromatids split at the centromere and travel towards opposite ends of the spindle. Each chromatid is now considered a full chromosome.

4 Telophase



Chromosomes return to the state of the interphase and the spindle apparatus begins to disassemble. New nuclear membranes are formed around the chromatids. Nucleoli begin to reappear. Cell division or cell division begins as a cleavage furrow in animal cells and a cell plate in plant cells.

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