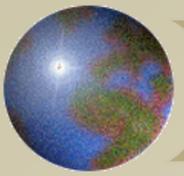
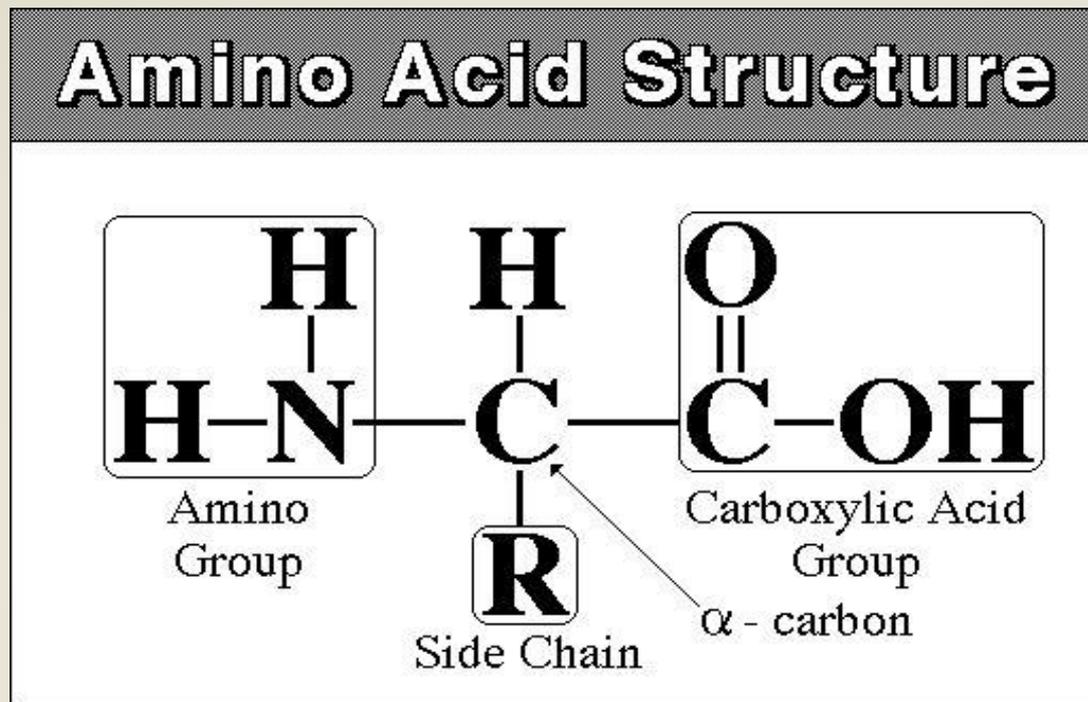


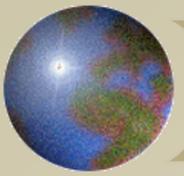
116 Things You Should Know

The Living Environment Regents
Review

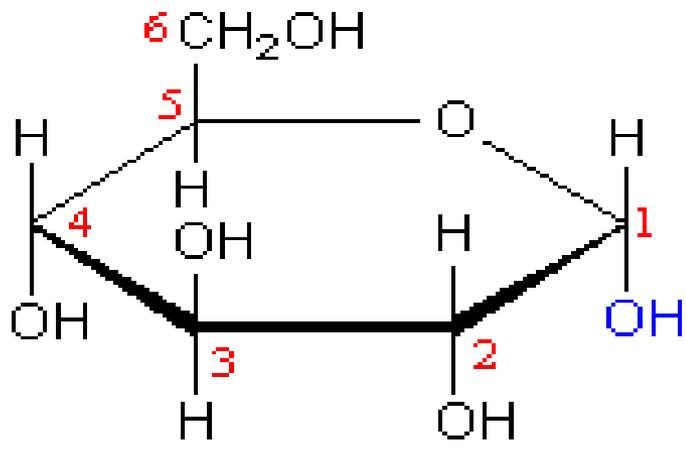


- Amino acids are the individual units that bond together to form a polypeptide (protein)*

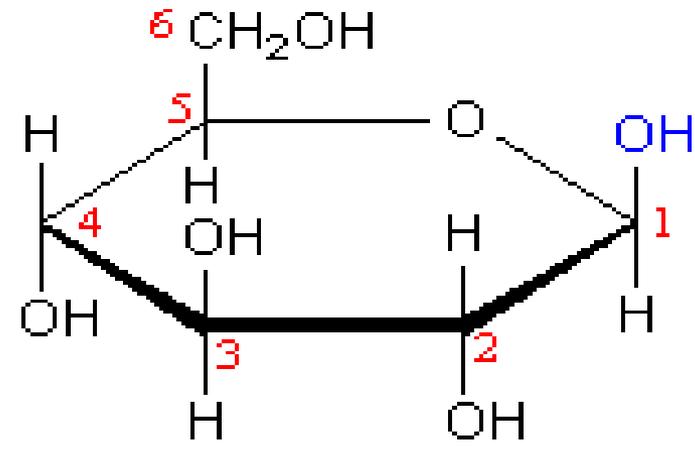




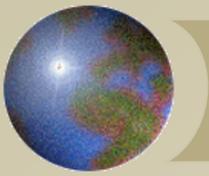
2. Monosaccharides are the individual units that bond together to form a polysaccharide (starch)



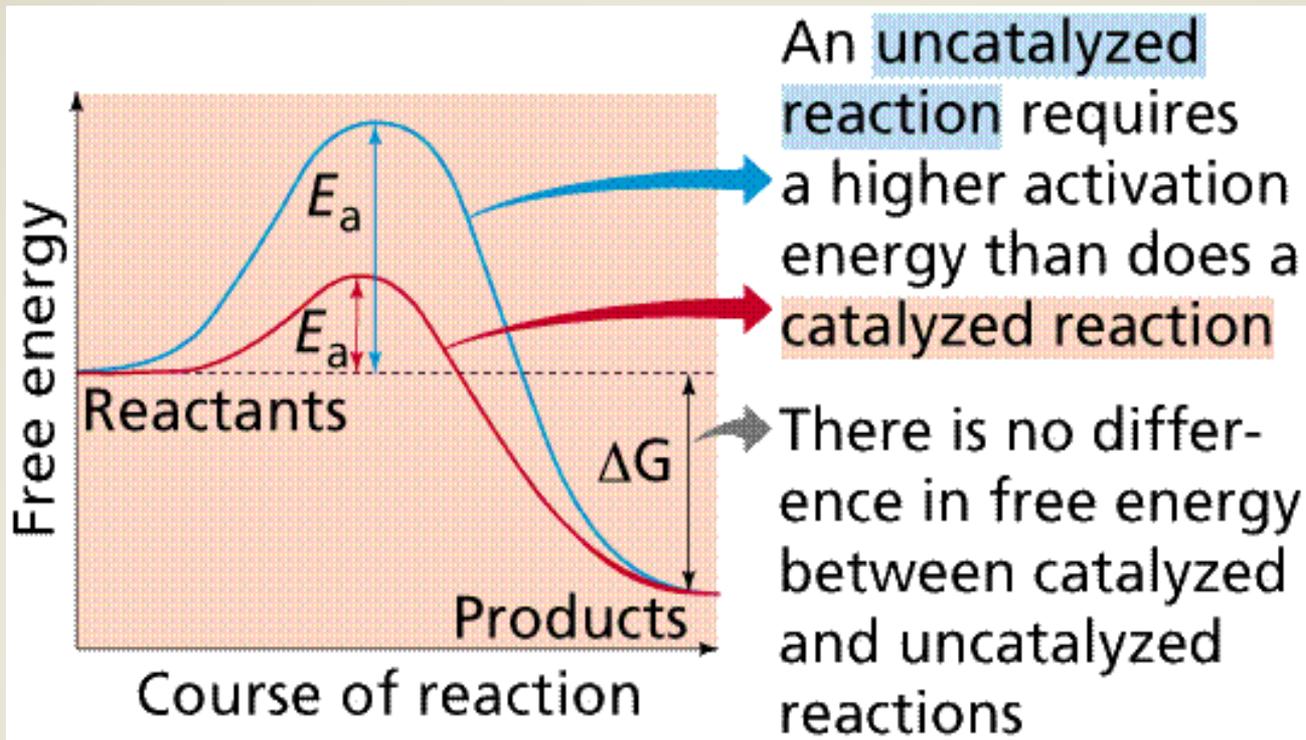
α -D-glucose

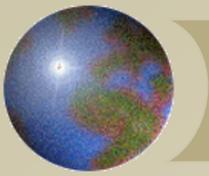


β -D-glucose



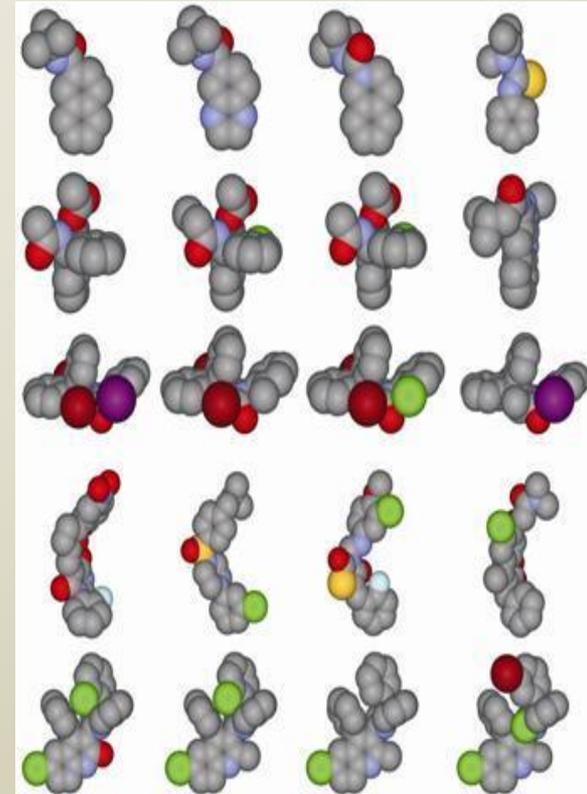
3. Enzymes are proteins molecules that catalyze (speed up) chemical reactions.

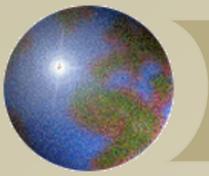




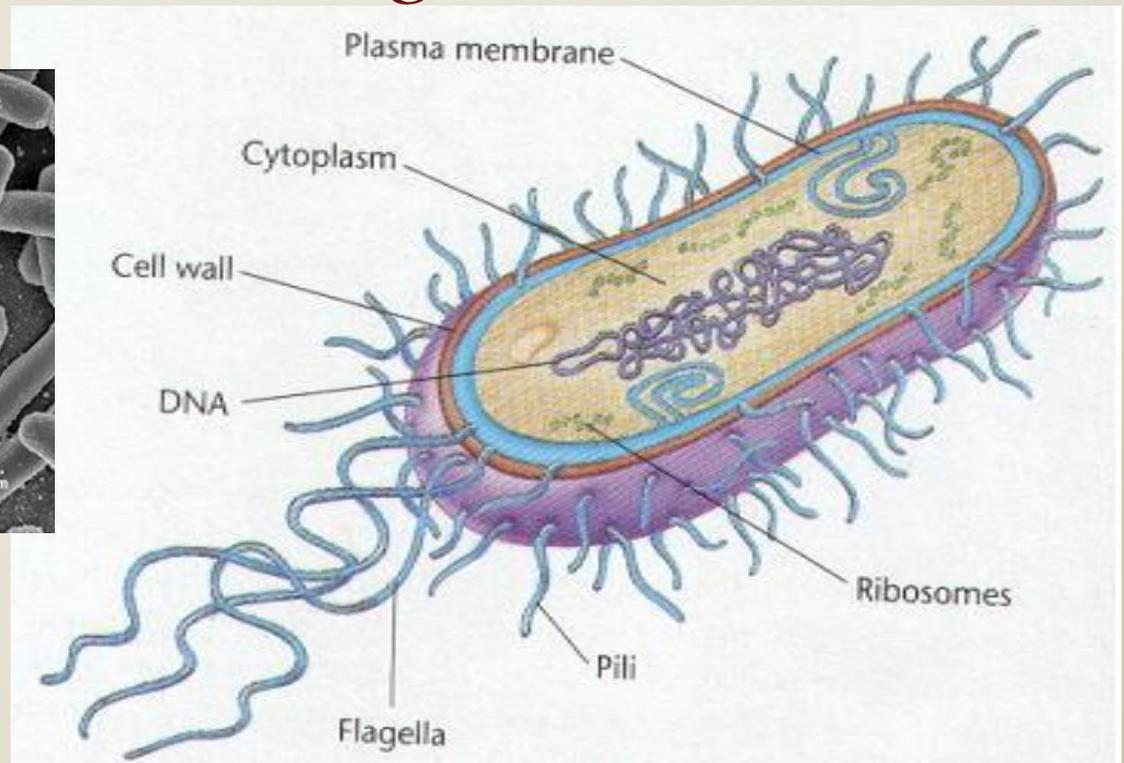
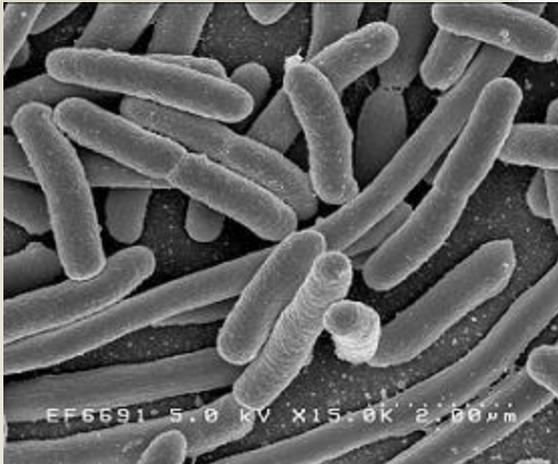
4. The 3-dimensional shape of a molecule is important to its proper functioning.

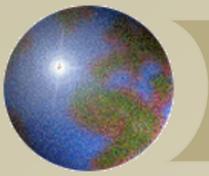
The protein's function depends largely on how it is folded to give it a specific 3D form. For example, folding brings together widely separated amino acids to form an active site—the catalytic region of an enzyme that binds with a biochemical substance to cause a specific activity in the body, such as digestion.





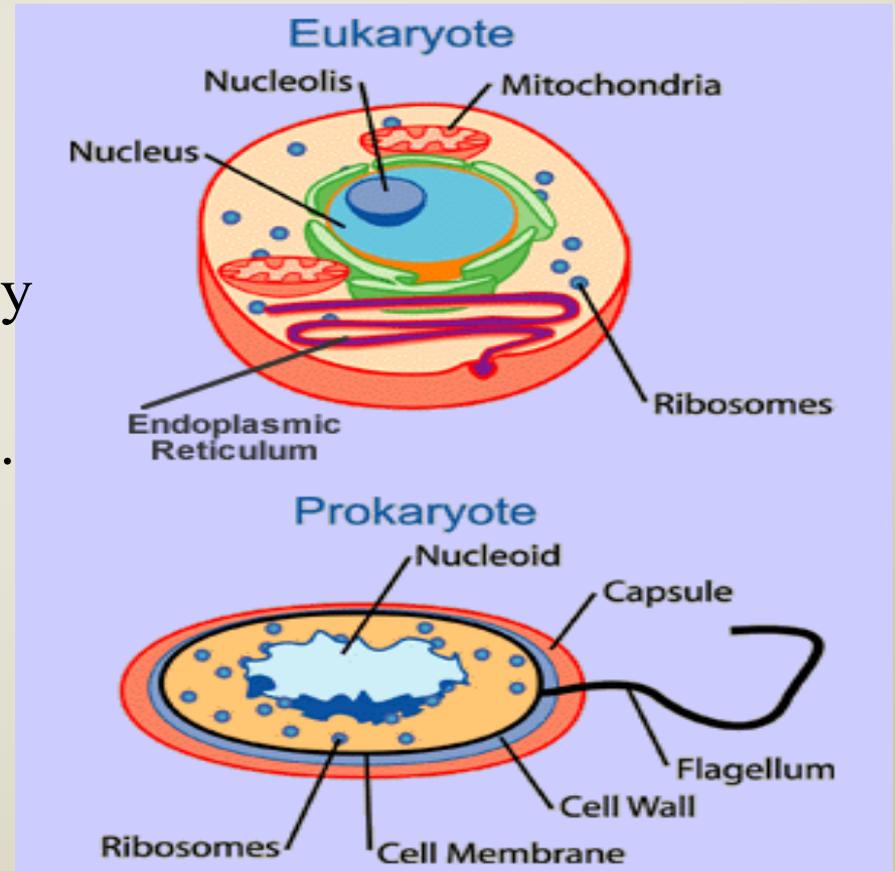
5. Bacteria are prokaryotic cells which lack a nuclear and other membrane bound organelles.

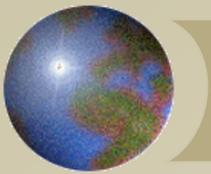




6. The nucleus contains DNA in eukaryotic cells.

Prokaryotic cells are fundamentally different in their internal organization from eukaryotic cells. Notably, prokaryotic cells lack a nucleus and membranous organelles.

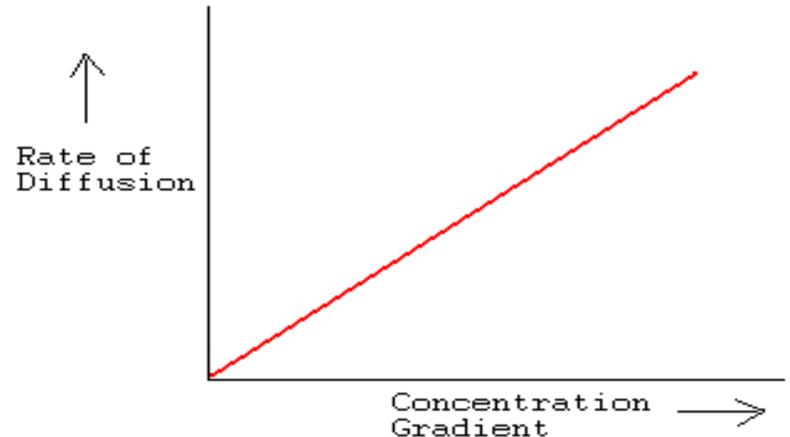


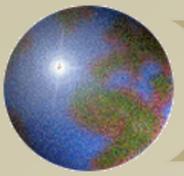


7. A large surface area will allow for a fast rate of diffusion into a cell.

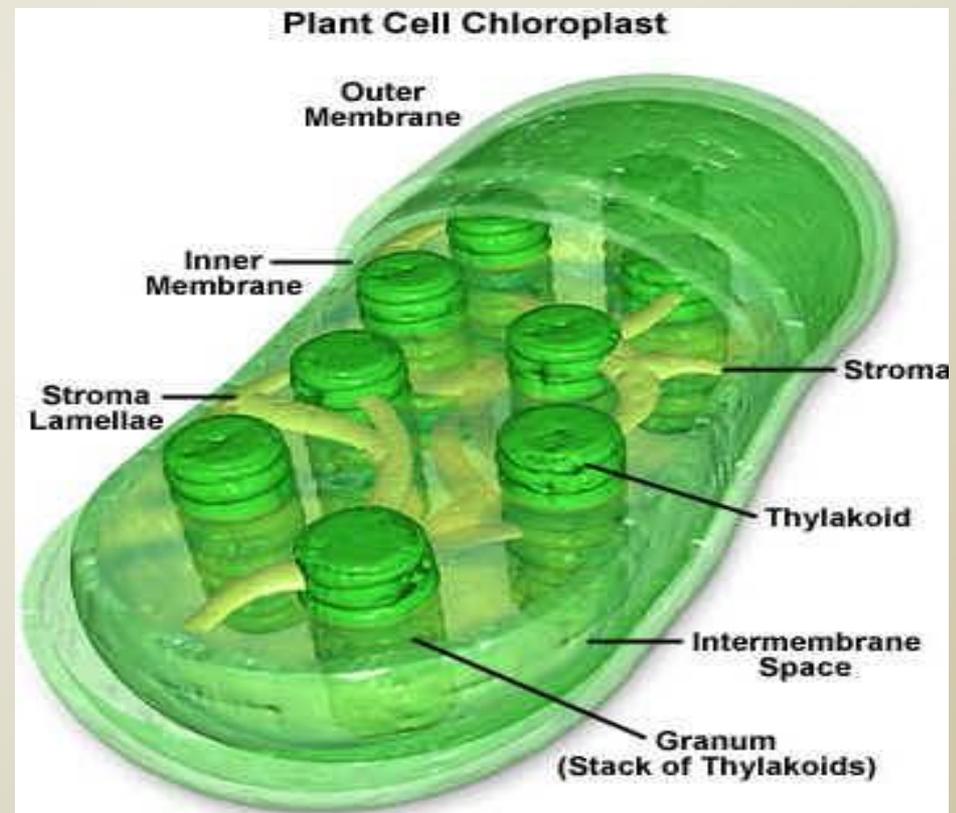
Rate of Diffusion \propto

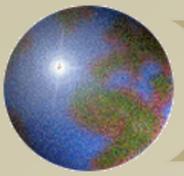
surface area x concentration difference
distance



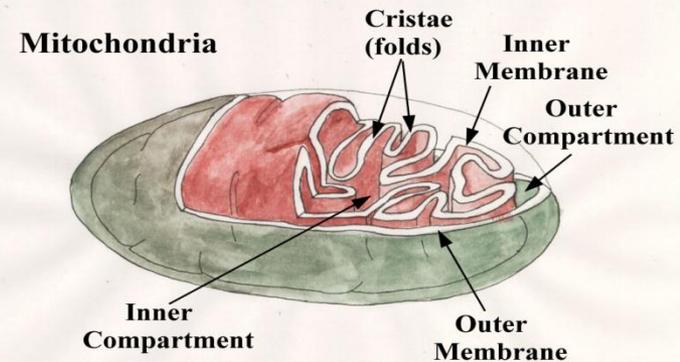


8. Chloroplasts are organelles found in autotrophic cells that produce glucose in the process of photosynthesis.



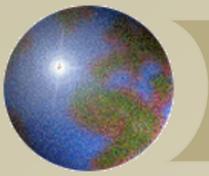


9. Mitochondria are the organelles where aerobic cellular respiration occurs to produce ATP energy in cells.

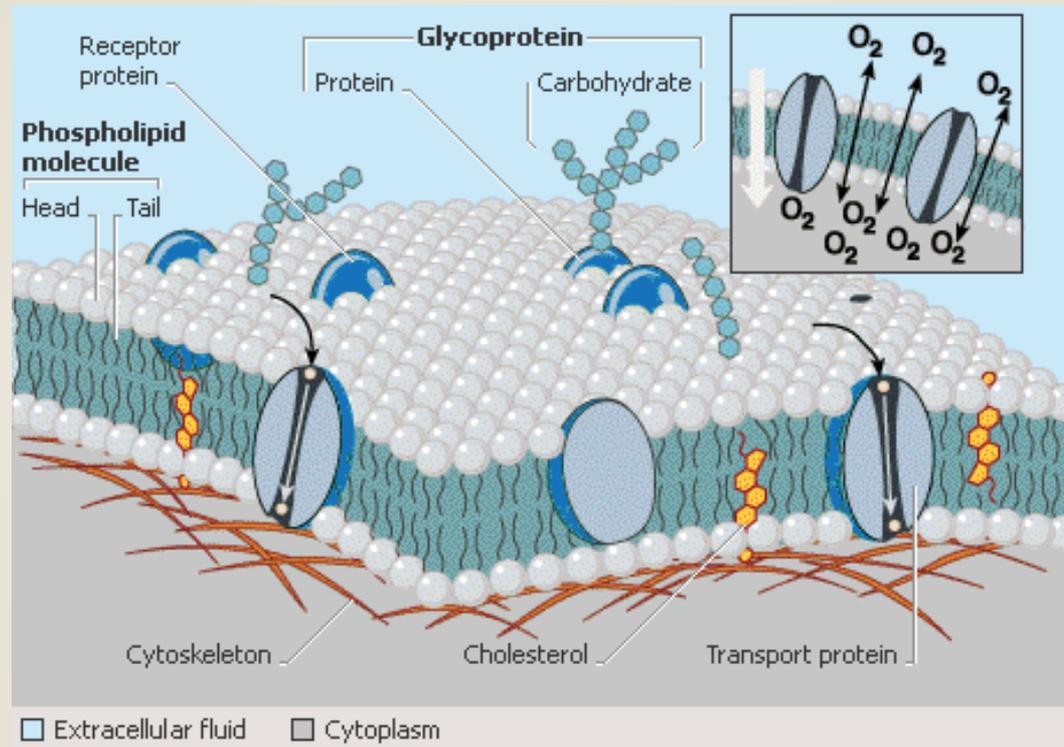


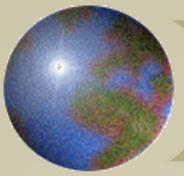
Nuclear Power Plant

The mitochondria (sometimes called the powerhouse of the cell) produces the energy that is needed to carry on all cellular processes. Energy is released when sugars are broken down during respiration.

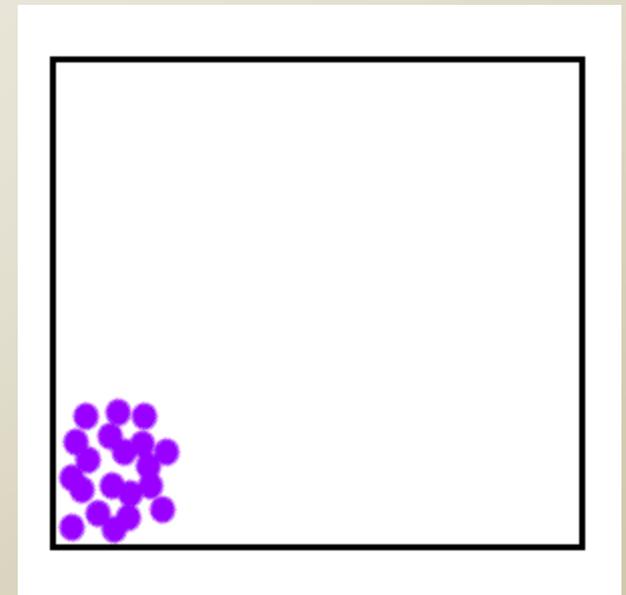
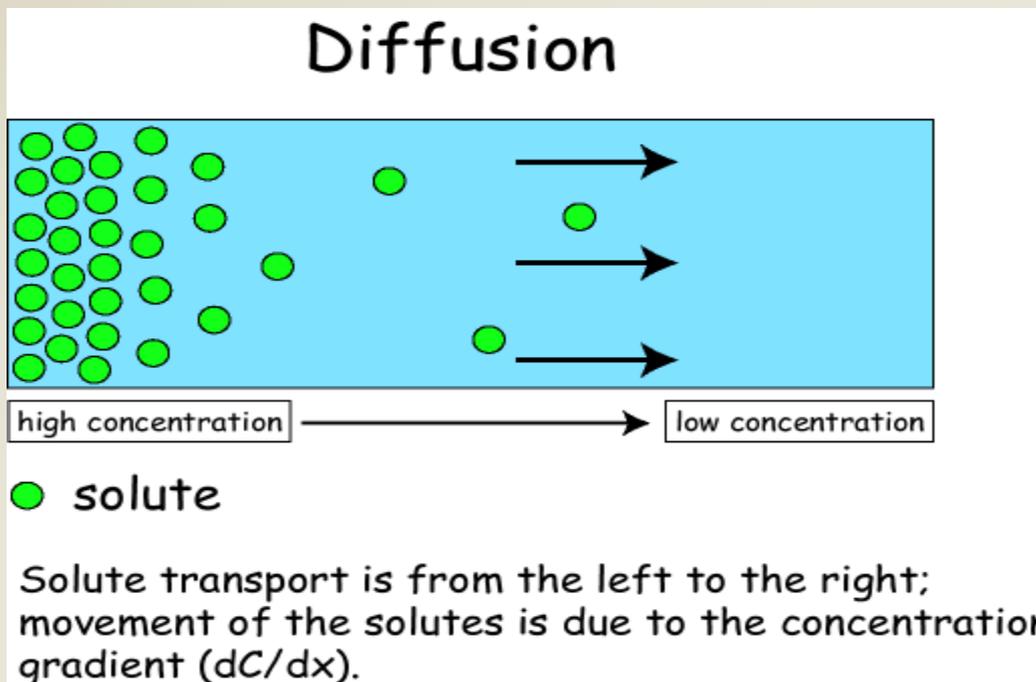


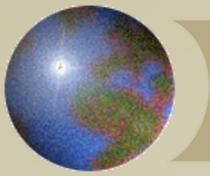
10. The cell membrane is a selectively permeable boundary around the cell.



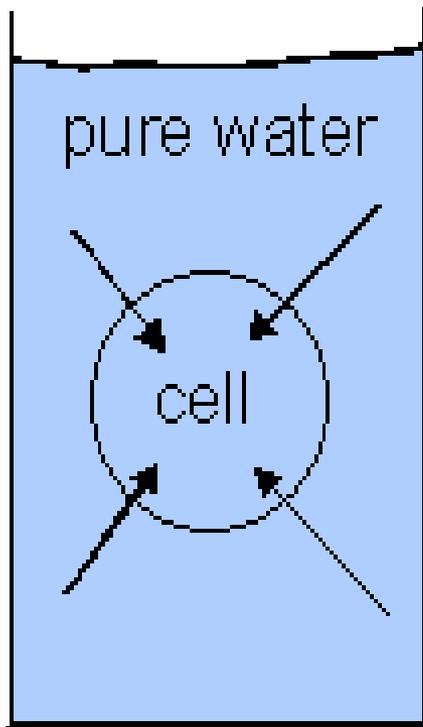


11. Diffusion from high to low concentration will occur across a membrane if the molecules are small and unchanged.

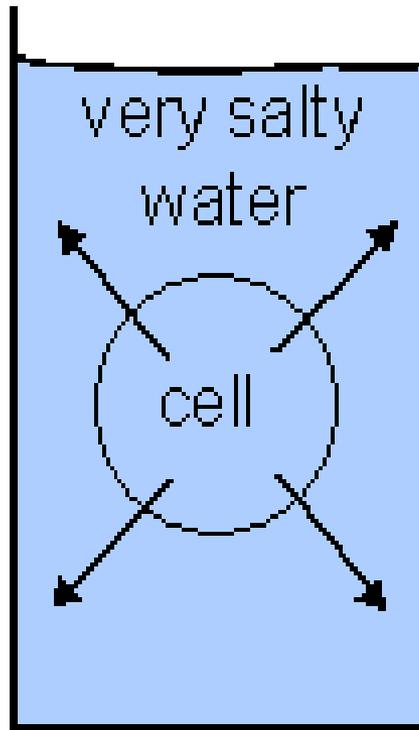




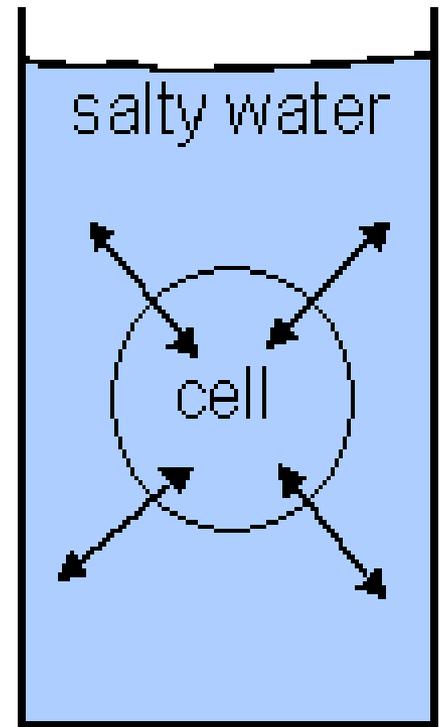
12. Types of solutions



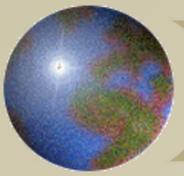
Hypotonic



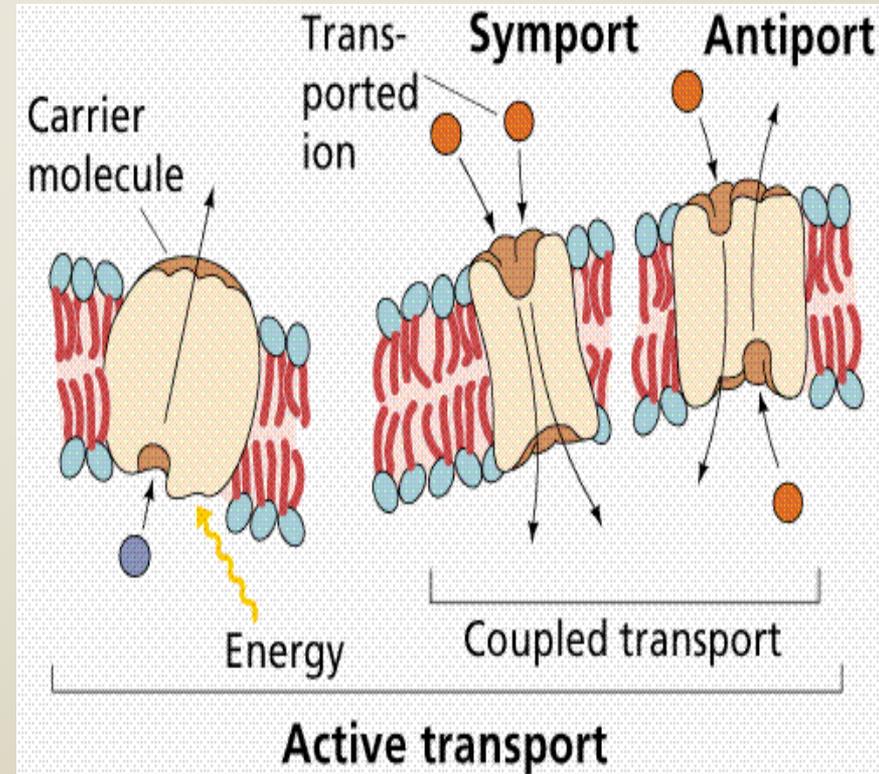
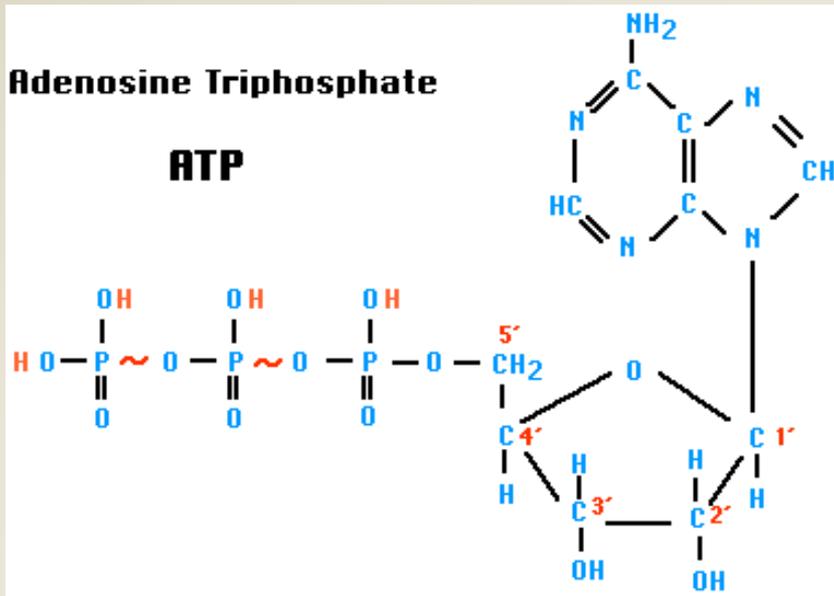
Hypertonic

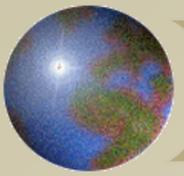


Isotonic



13. Active transport occurs when membrane proteins use ATP energy to carry materials into and out of a cell.





14. Receptor proteins in cell membranes attach to specific molecules.

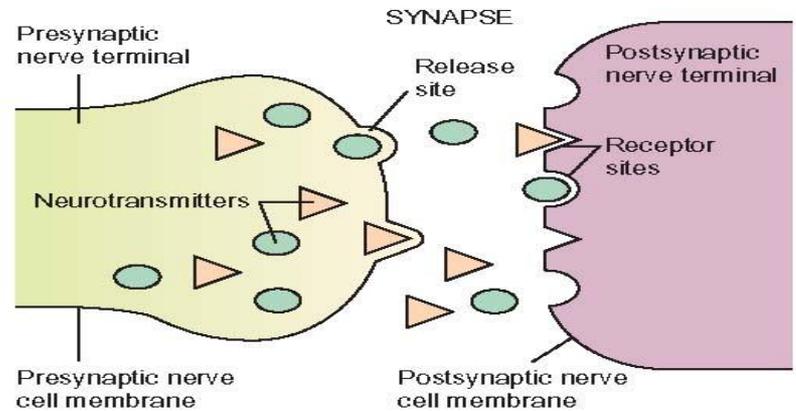
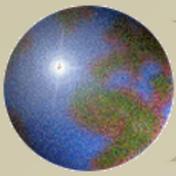
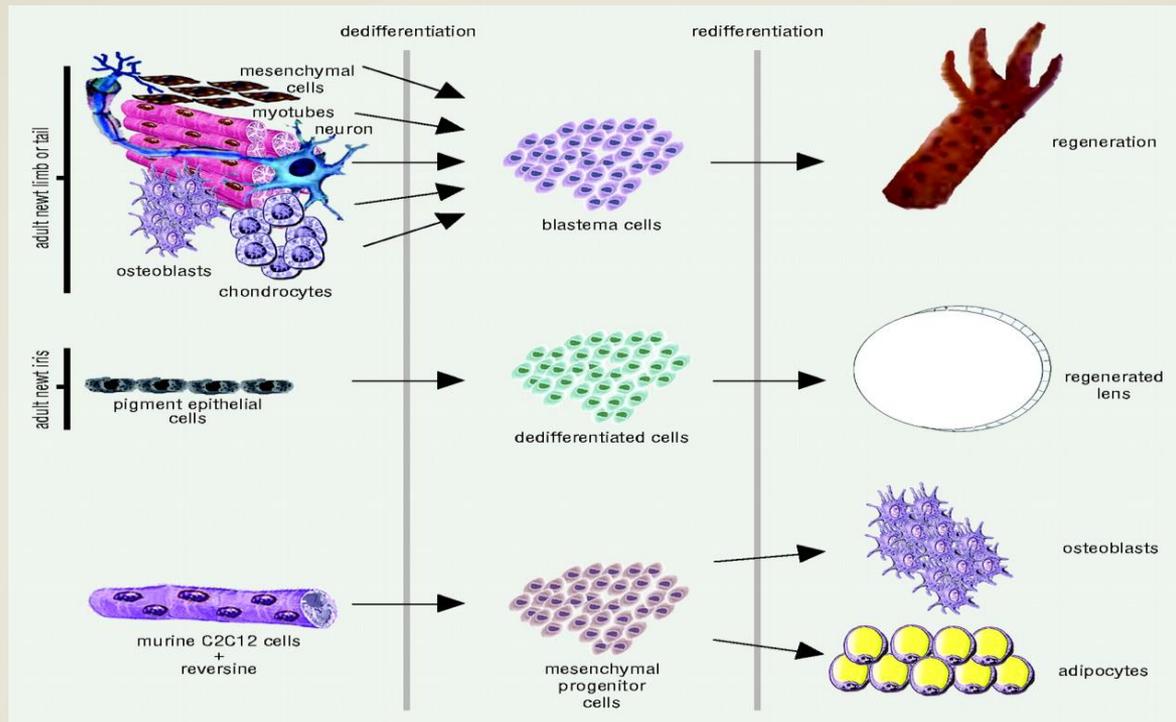


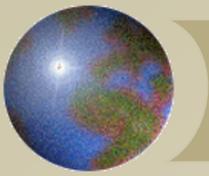
Figure 5-1 Neurotransmission in the central nervous system. Neurotransmitter molecules (eg, norepinephrine and acetylcholine), released by the presynaptic nerve, cross the synapse and bind with receptor proteins in the cell membrane of the postsynaptic nerve.

Copyright © 2004 by Lippincott Williams & Wilkins. *Clinical Drug Therapy: Rationales for Nursing Practice, 7th Edition* by Anne Collins Abrams.

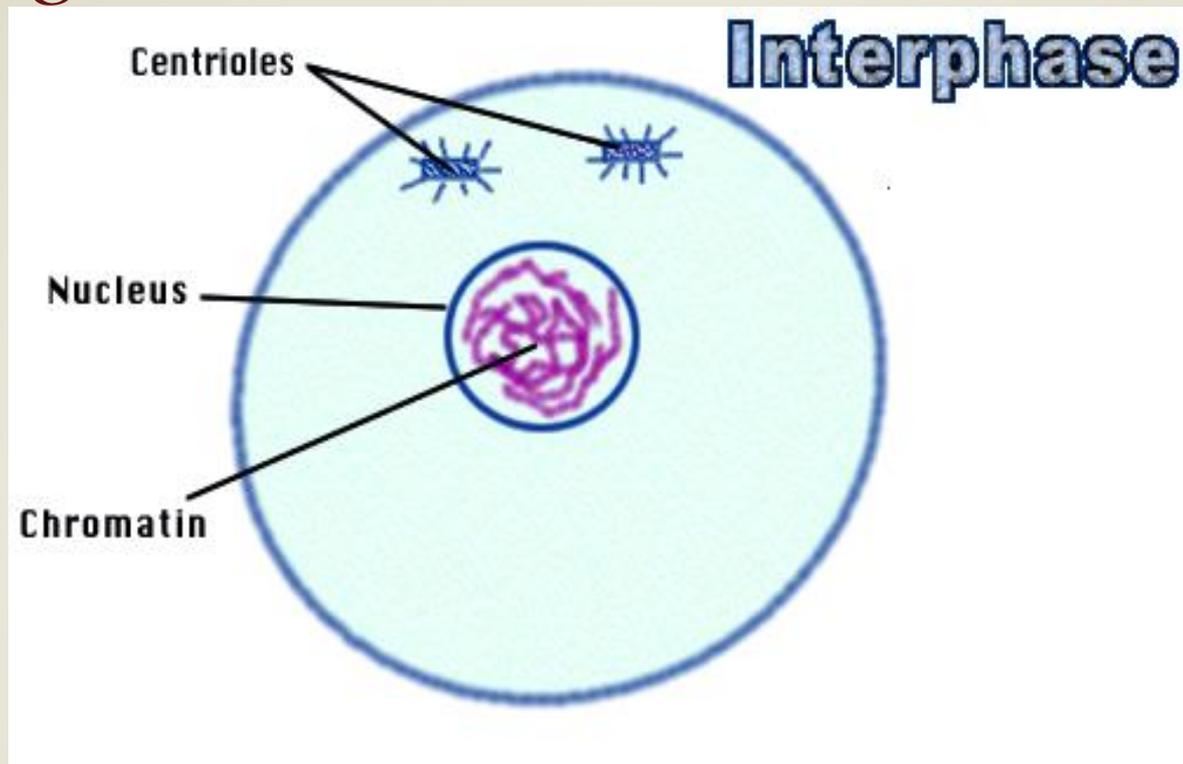


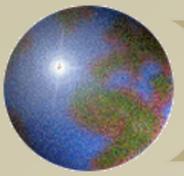
15. Many of the cells inside the human body are differentiated to carry out specific functions.



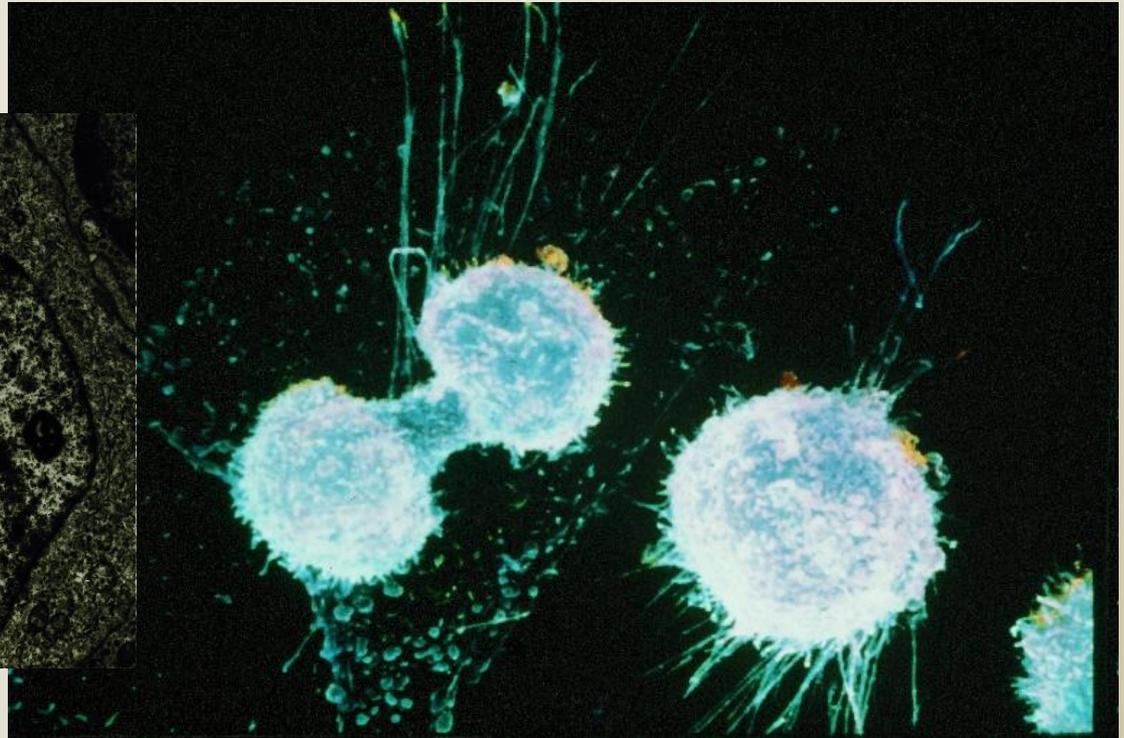
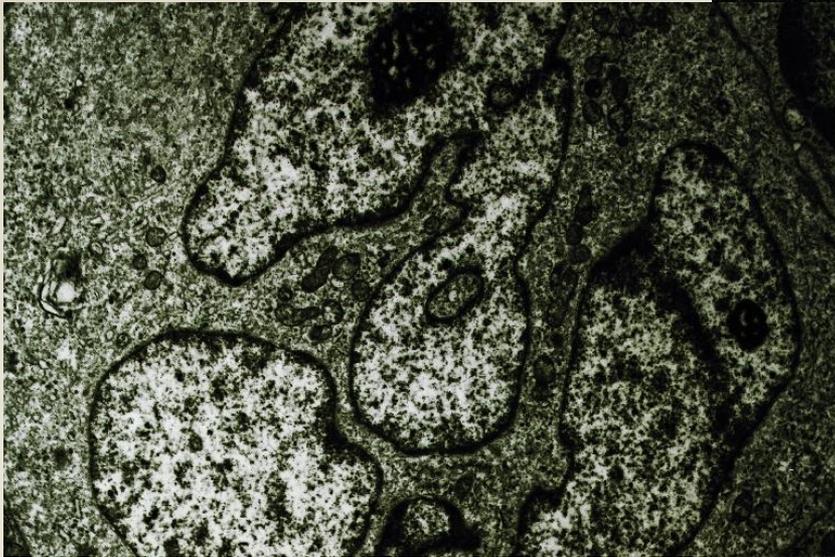


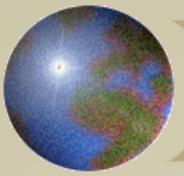
16. Mitosis involves a diploid cell dividing into two identical daughter cells.



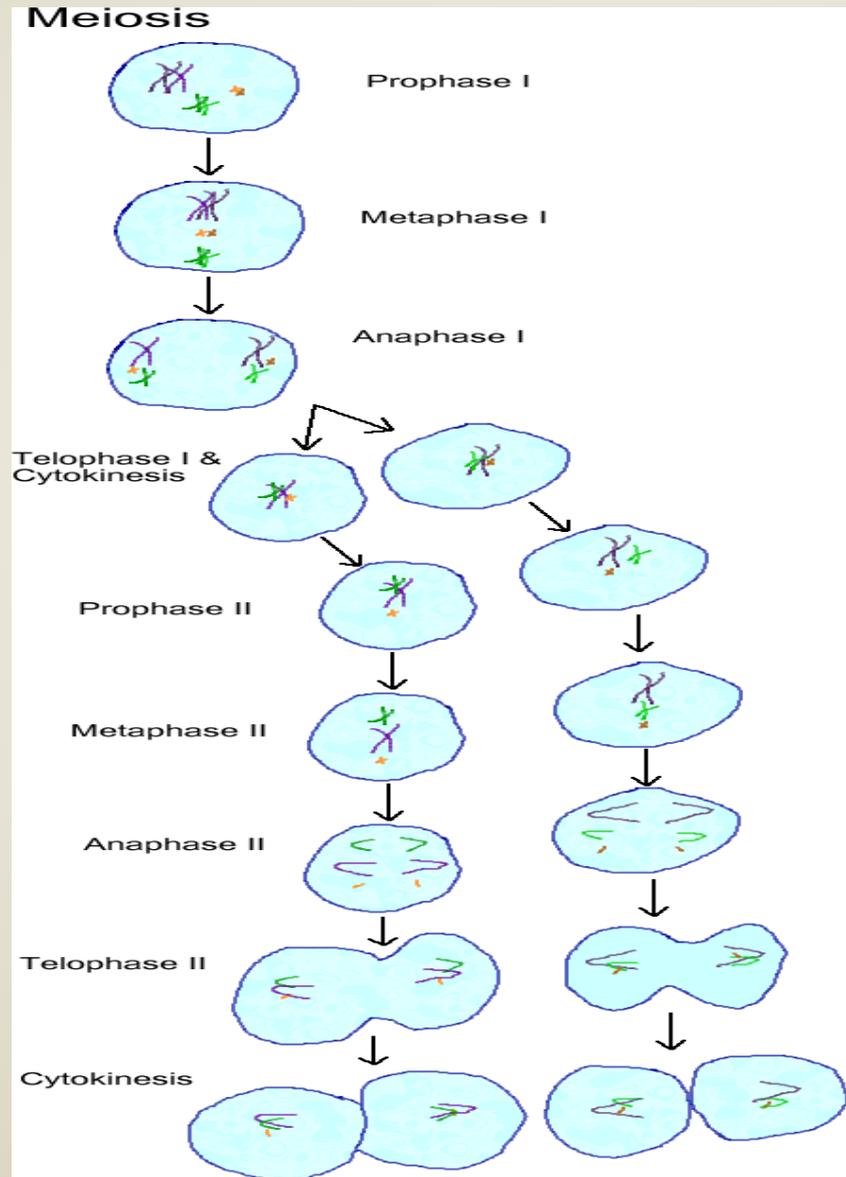


17. Cancer involves body cells dividing uncontrollably by mitosis.



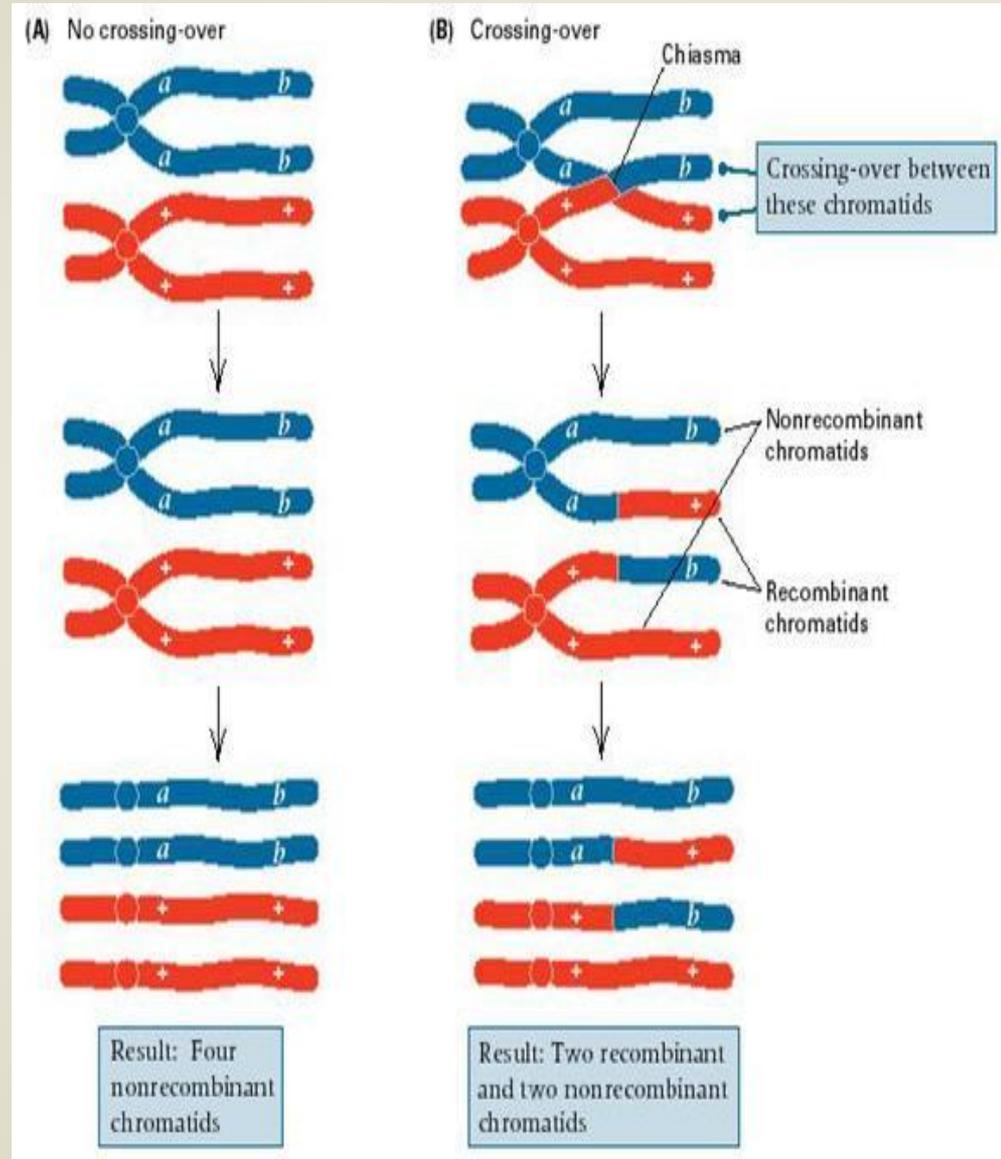


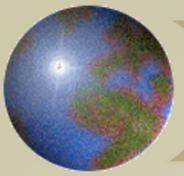
18. Meiosis is the process of producing haploid cells.



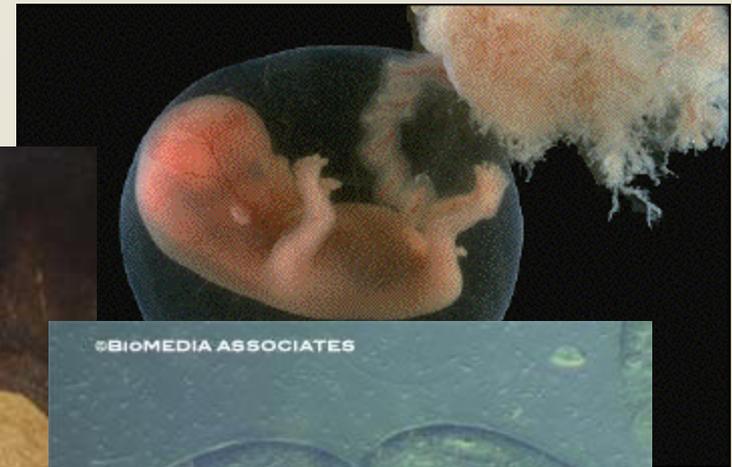
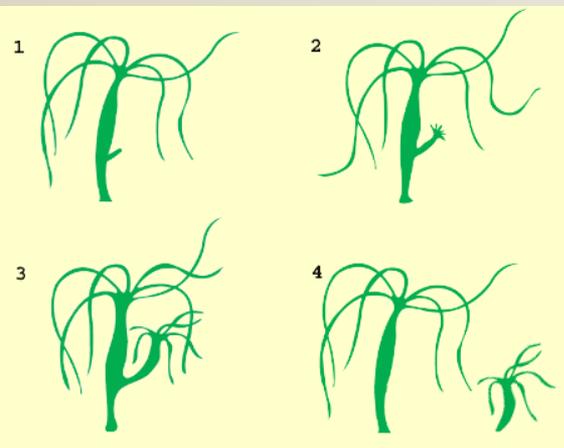
19. Meiosis is

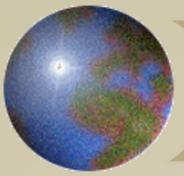
one of the factors responsible for producing variation among the gametes produced by an organism.



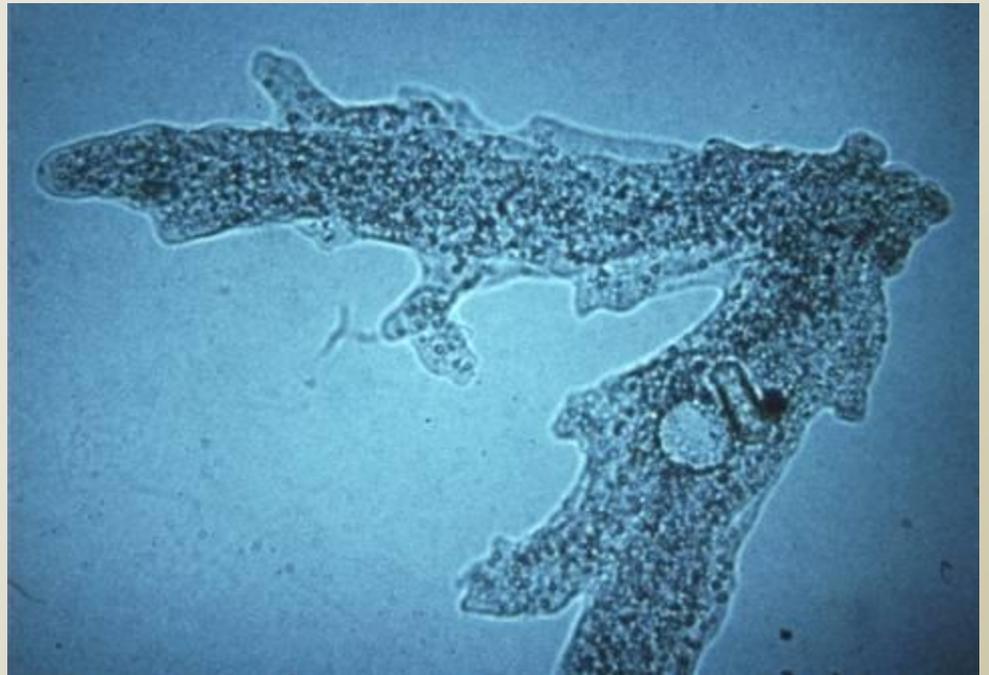
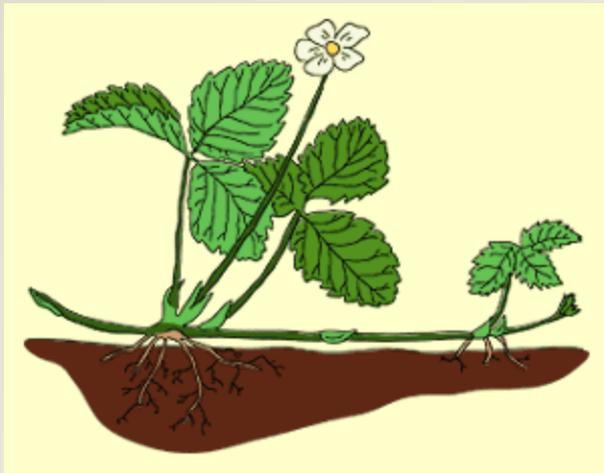


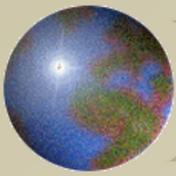
20. New individuals of an existing species are produced through the process of reproduction.



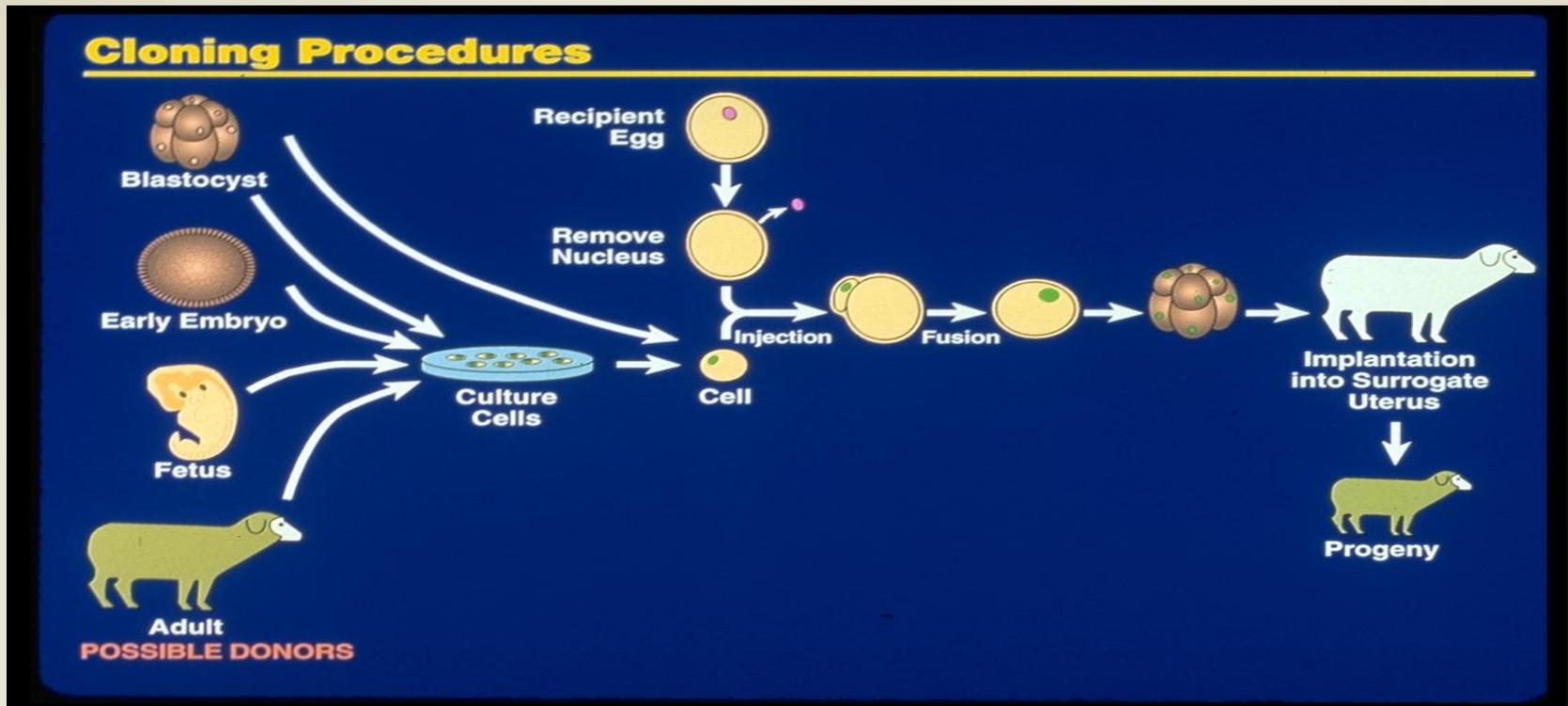


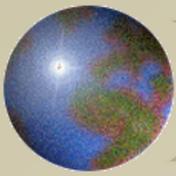
21. Asexual reproduction produces offspring that are genetically identical to the parent organism.



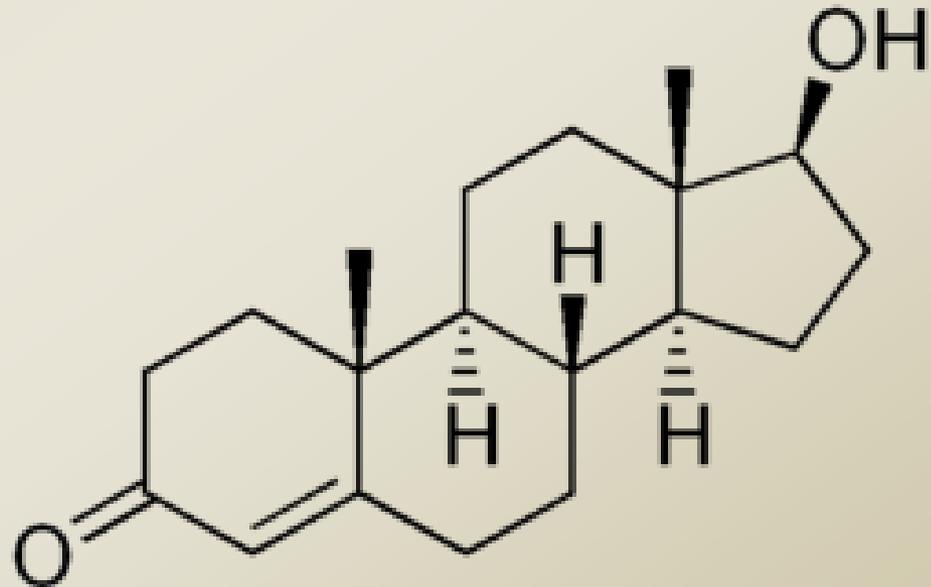


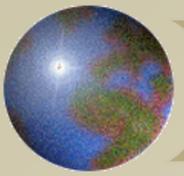
22. Modern cell biology techniques allow complex organisms such as mammals to be clones.



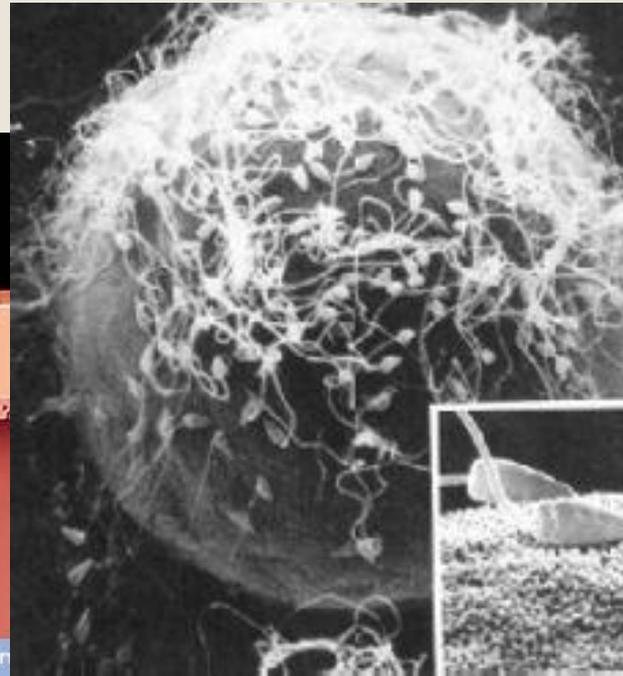
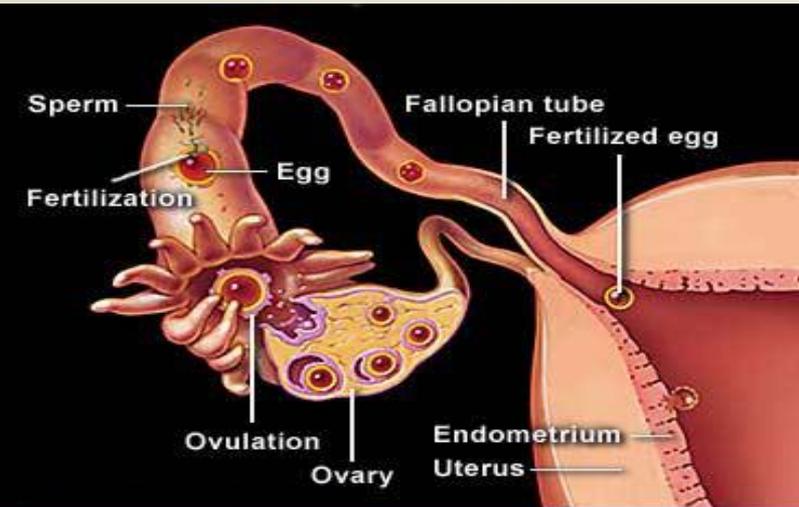


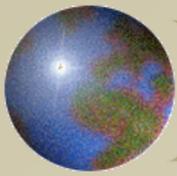
24. *Testosterone is the hormone that stimulates gamete (sperm) production and the formation of secondary sex characteristics in males.*



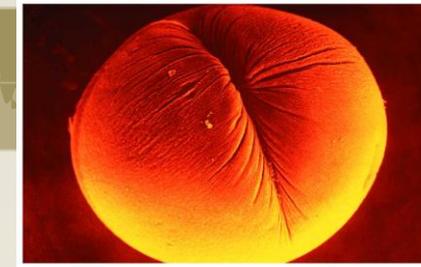


25. Fertilization is the process that involves the fusion of a haploid sperm cell with a haploid egg cell to form a diploid cell called a zygote.

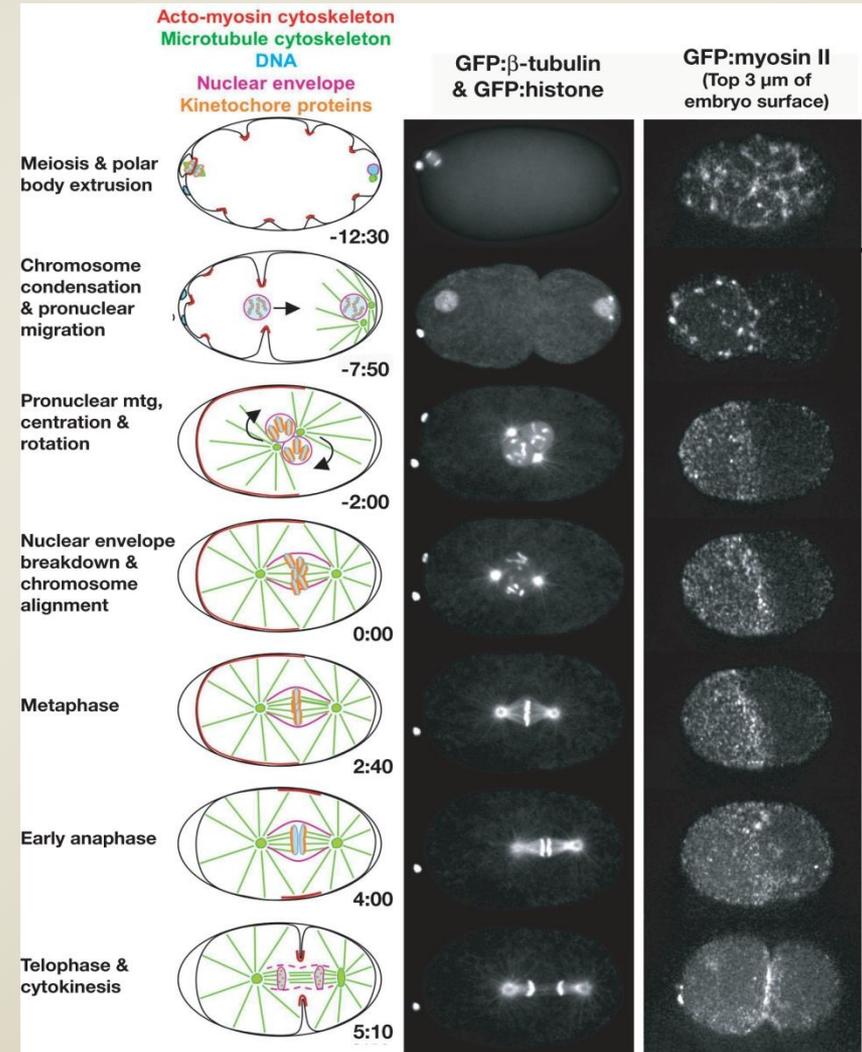


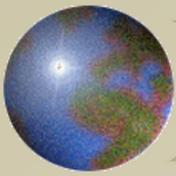


Cytokinesis in animals

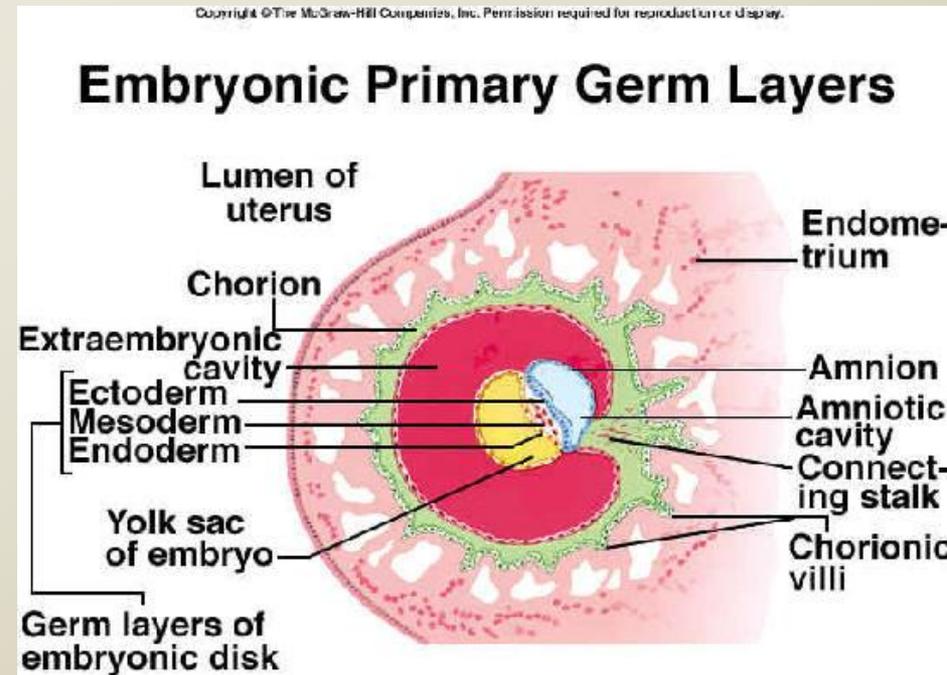
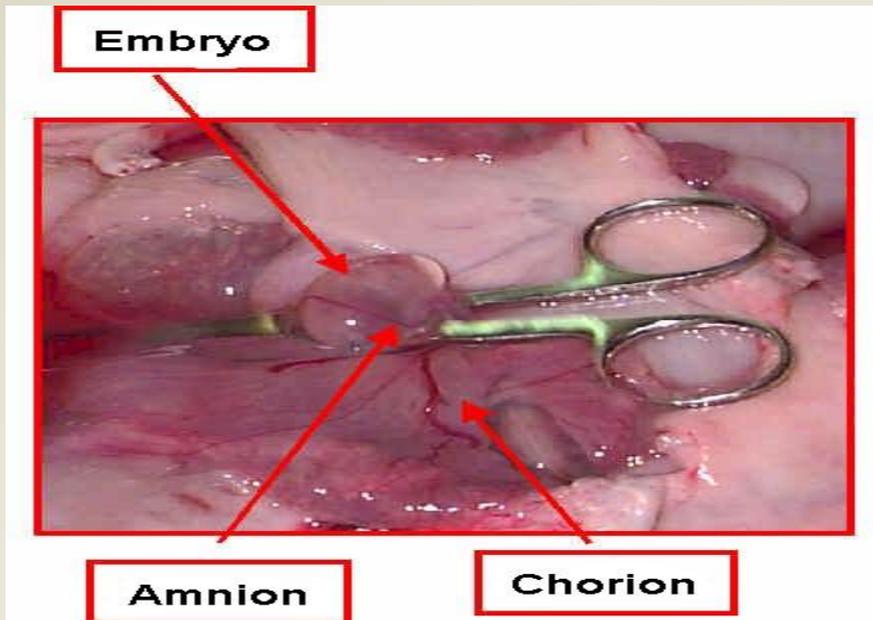


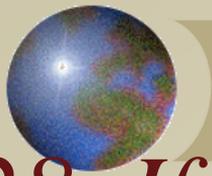
26. *Cleavage is the type of mitotic cell division without a change in cell size involved in embryonic development.*



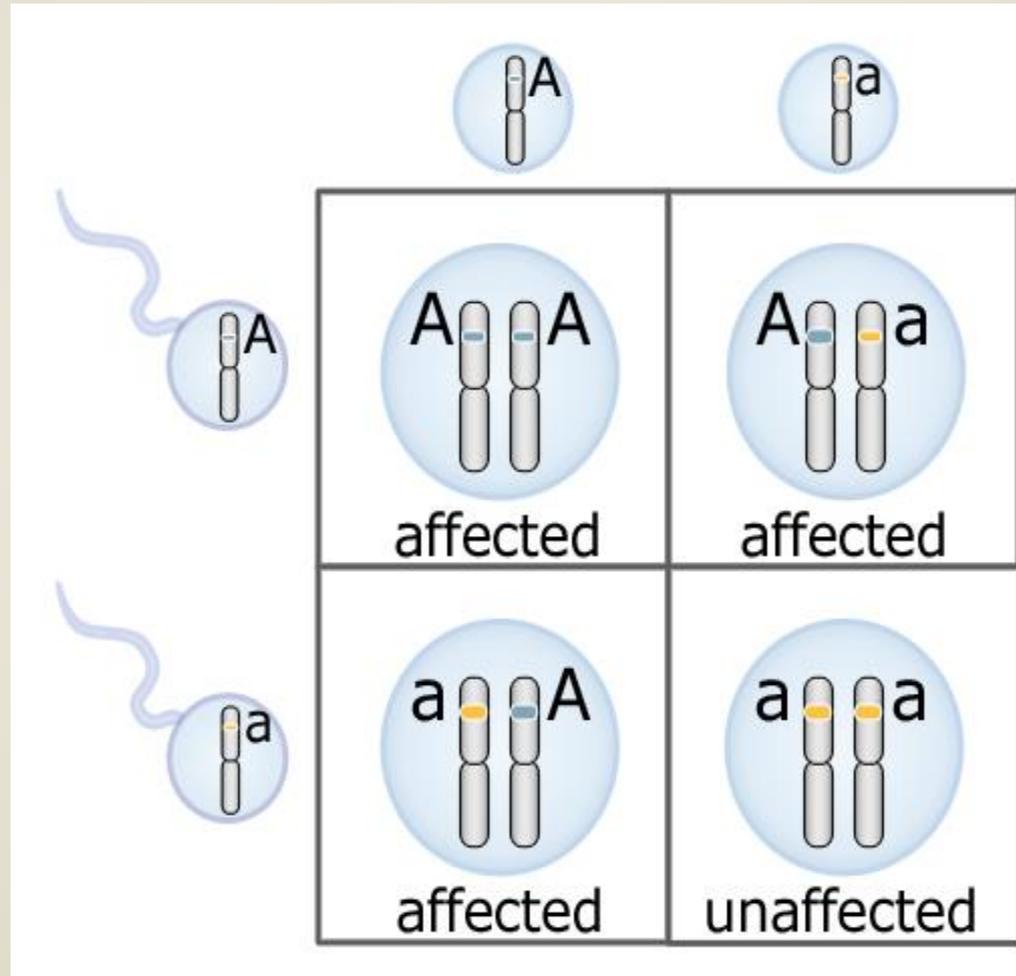


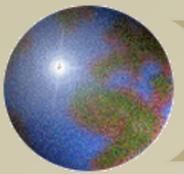
27. During intrauterine development in humans, the chorion, amnion, and placenta are necessary to maintain homeostasis.



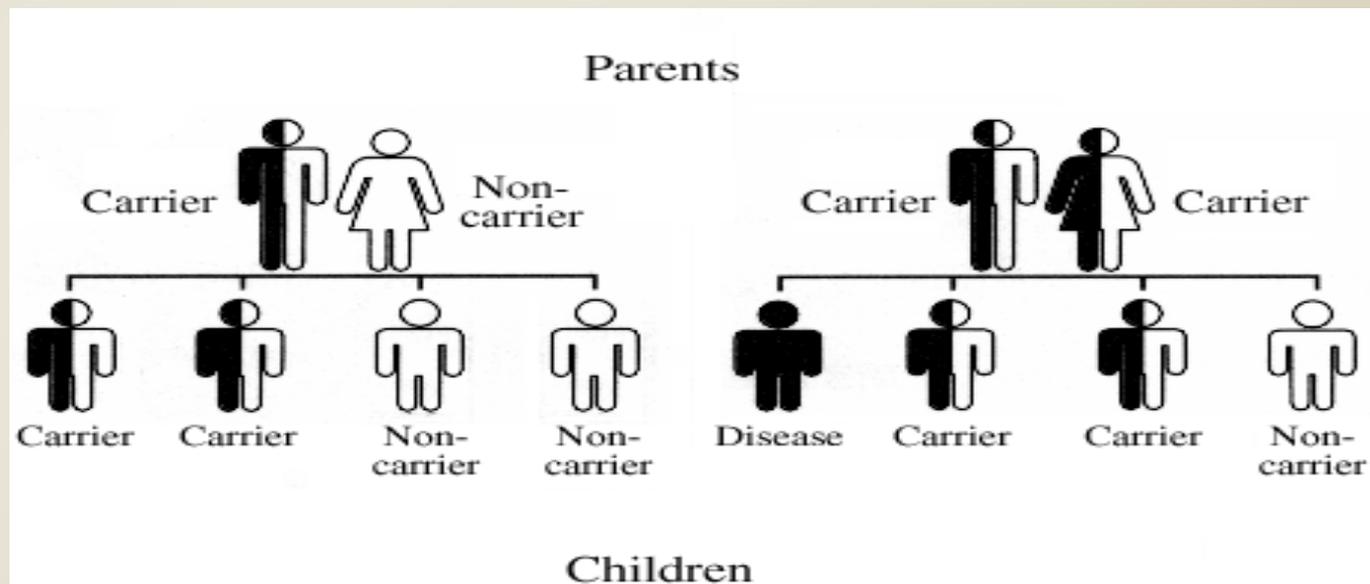


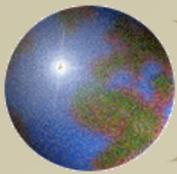
28. *If parents with desirable characteristics are selected to mate, the chance that their offspring will possess the alleles for these characteristics is high.*



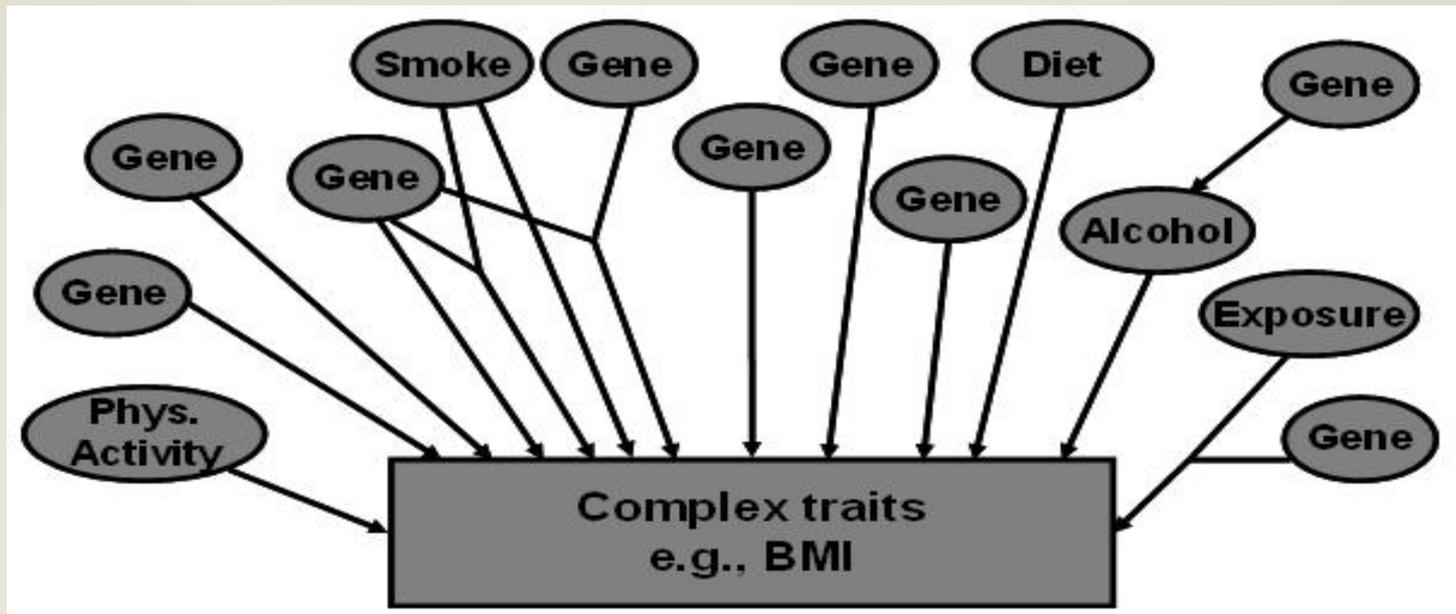


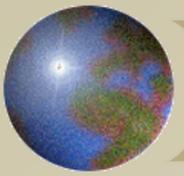
29. *Genetic diseases are inherited through DNA codes and are transmitted from parents to offspring during sexual reproduction.*



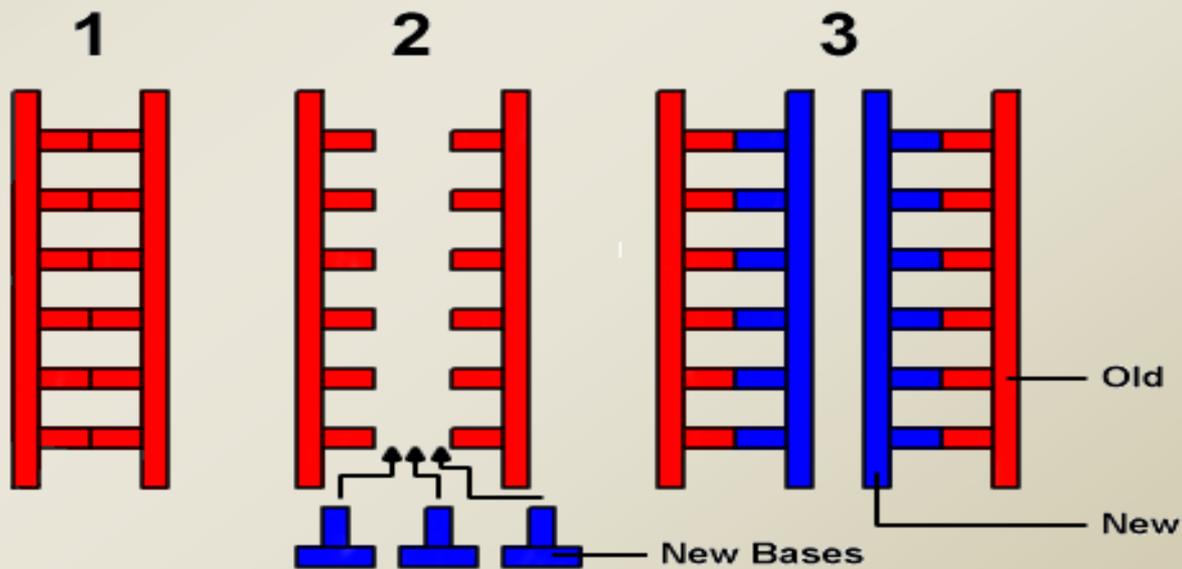


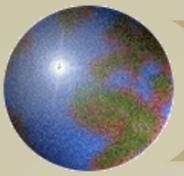
31. Environmental factors such as temperature and light can turn-on and turn-off genes in organisms.



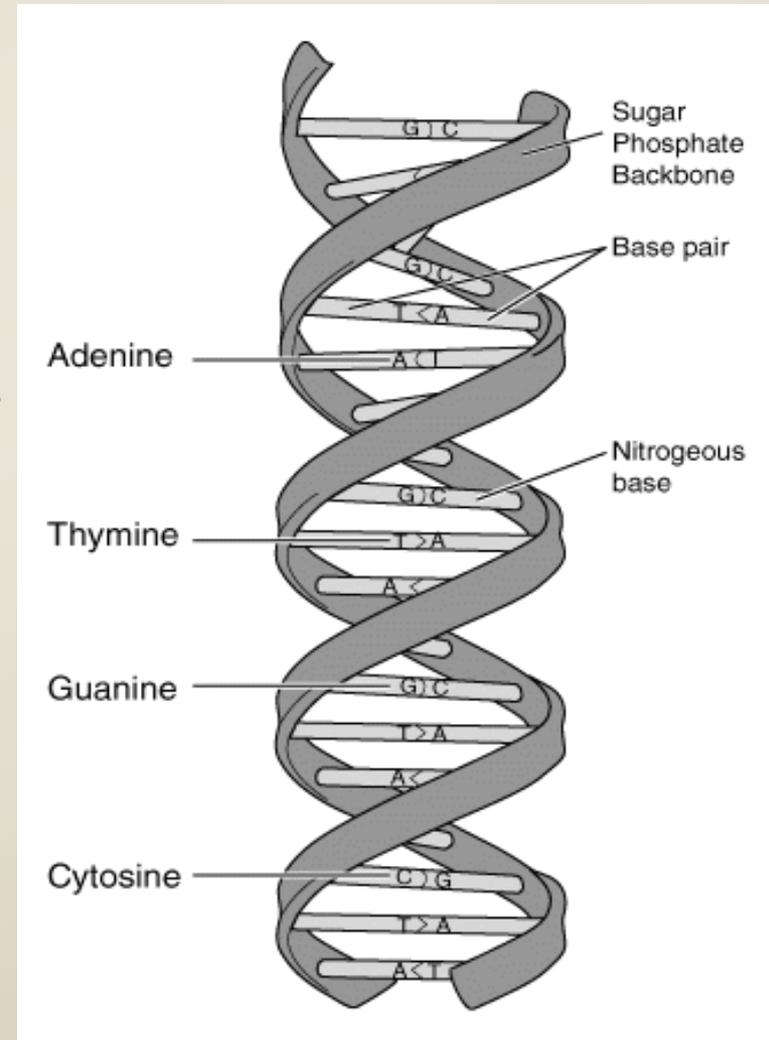


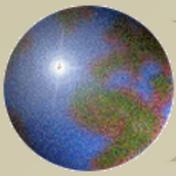
32. DNA replication involves making an identical copy of a cell's DNA.



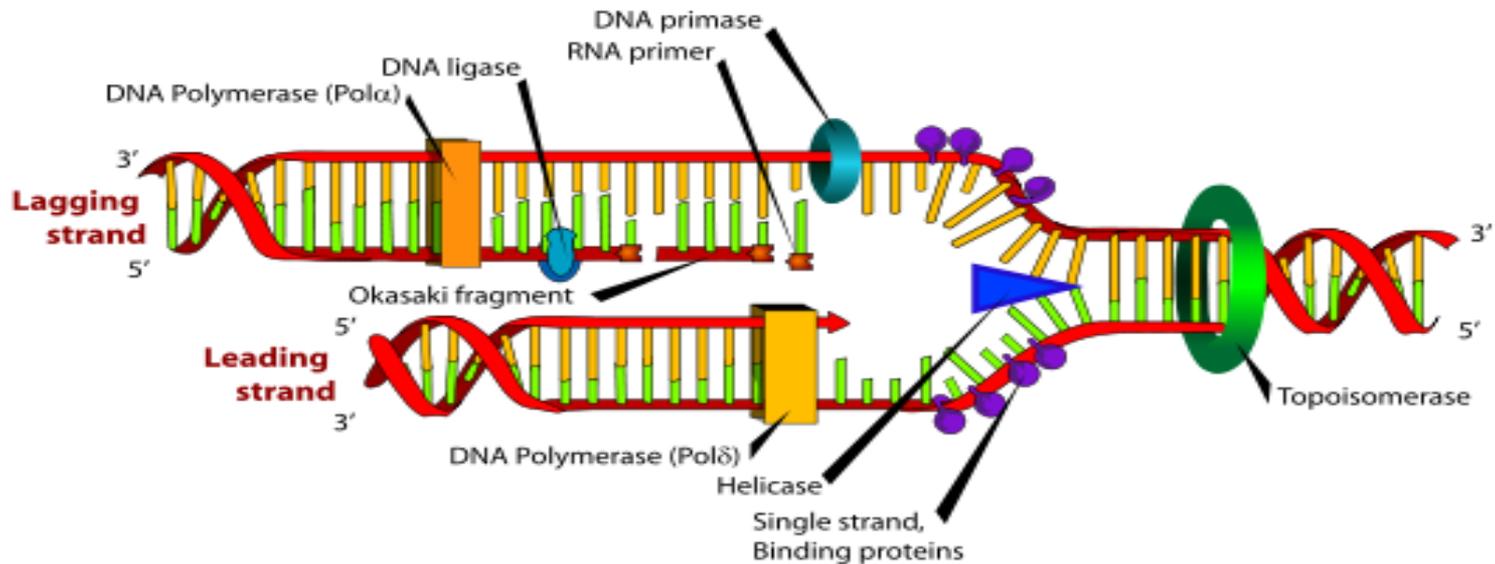


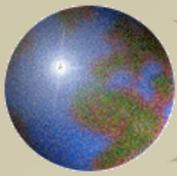
33. DNA replication involves matching nucleotide bases together using the law of complementary base pairing. AT-CG



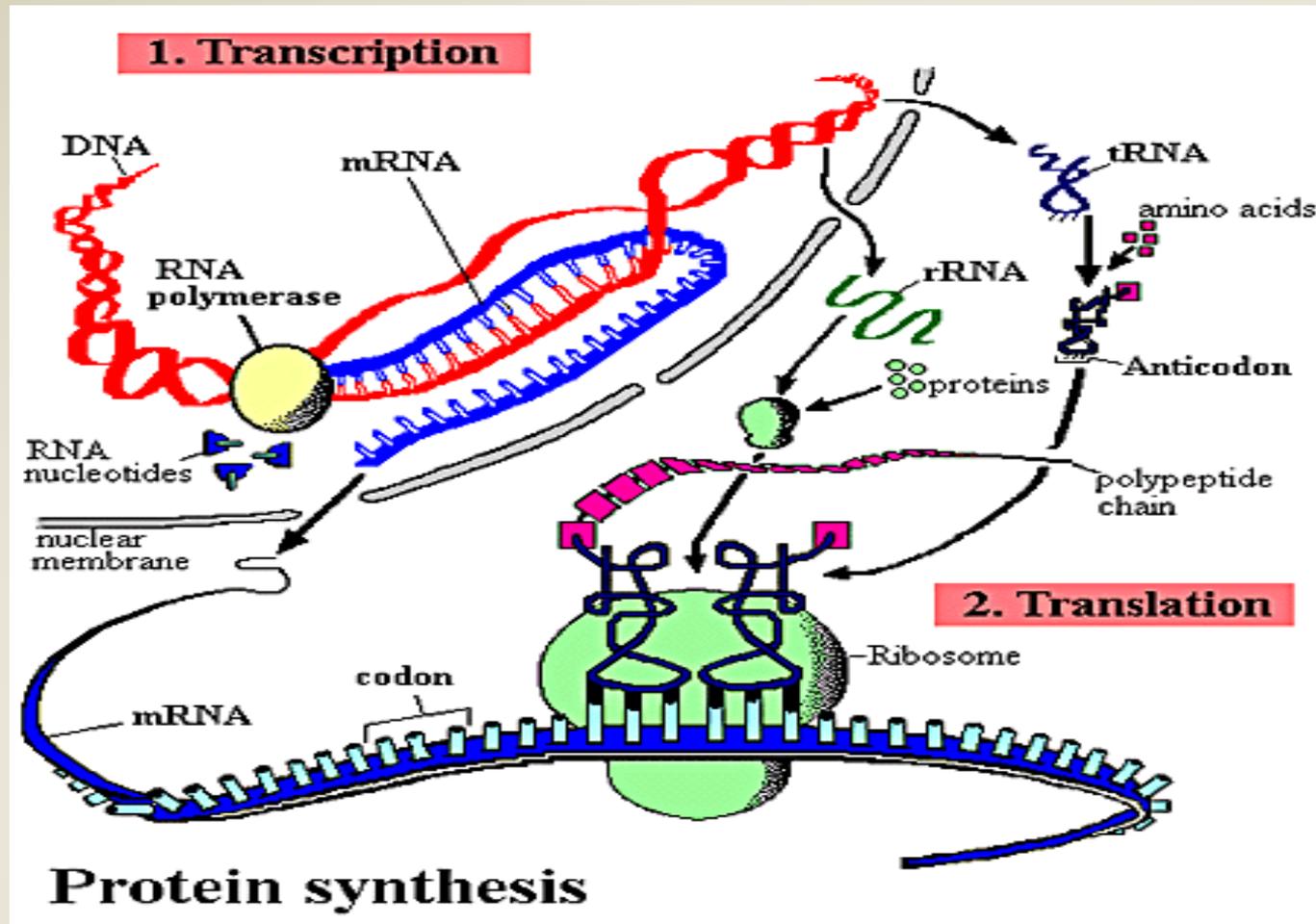


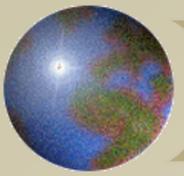
34. *During DNA replication, the double strand of DNA unzips as weak H bonds between the base pairs are broken.*



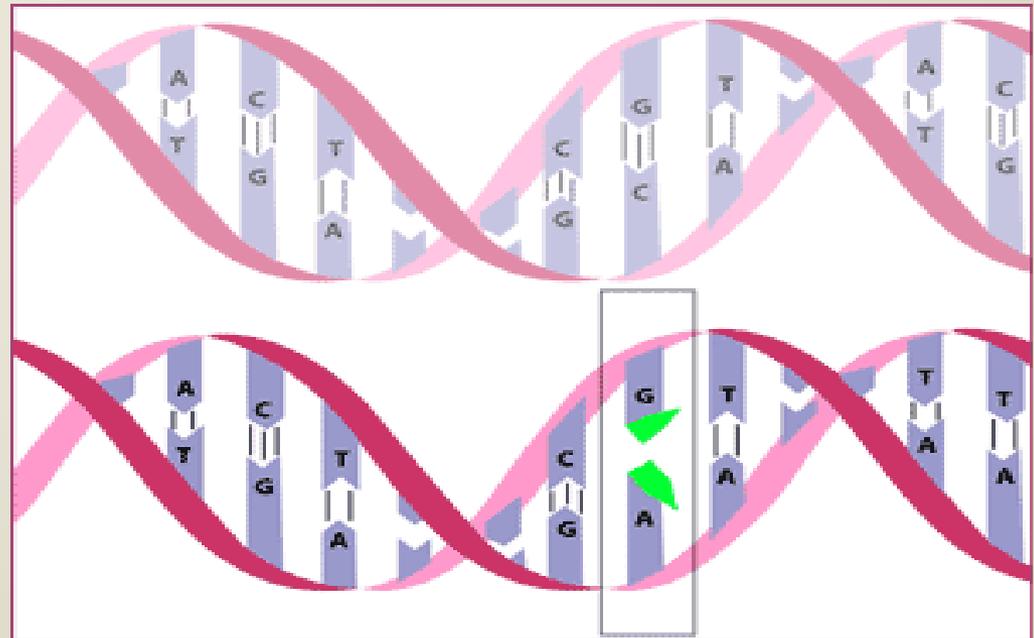


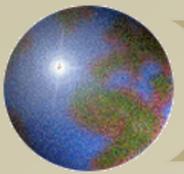
35. $DNA \rightarrow RNA \rightarrow Protein$



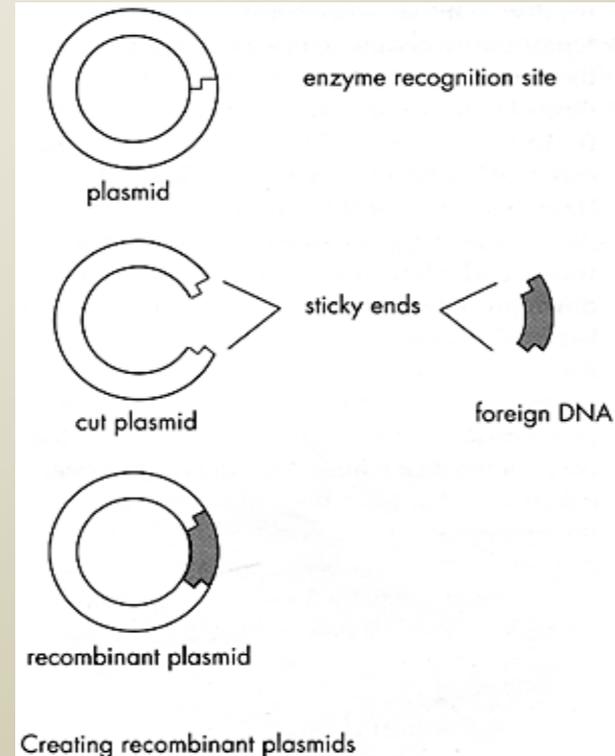
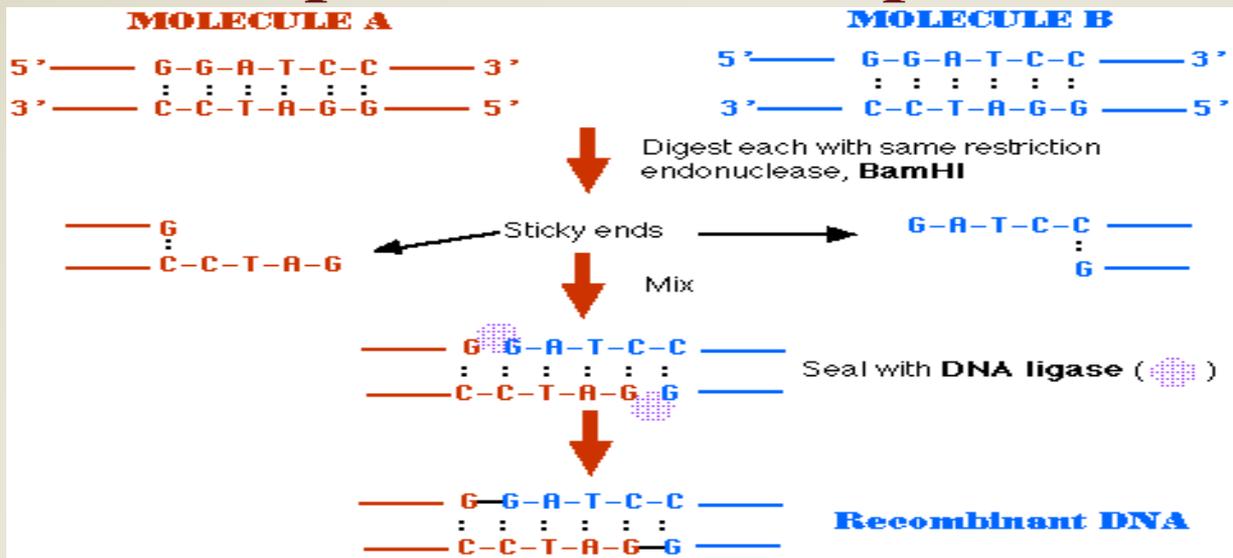


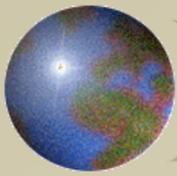
36. DNA mutations may result in the production of abnormal proteins that do not function correctly, or the stopping of protein production.



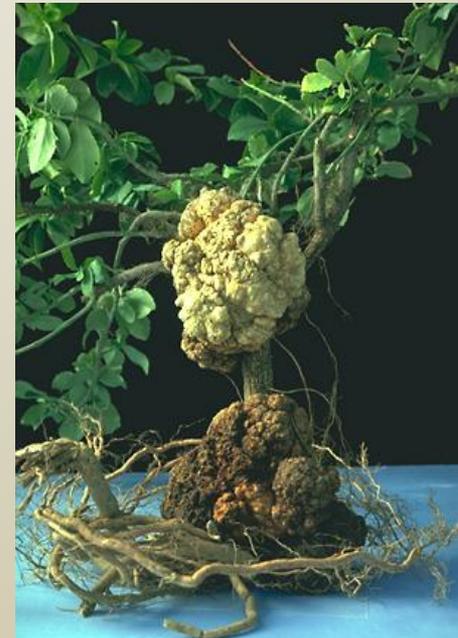


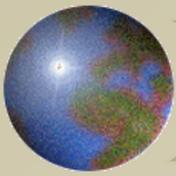
37. Insertion of recombinant plasmids into bacterial cells by transformation will allow them to produce new proteins.



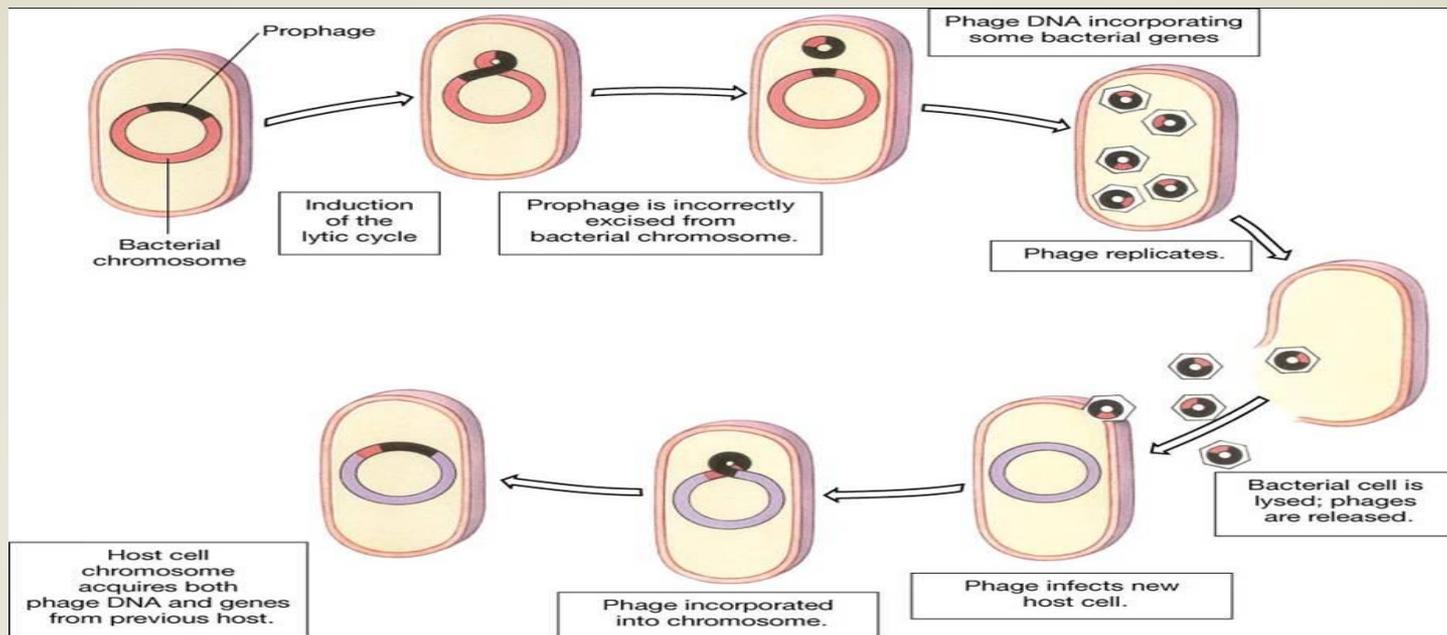


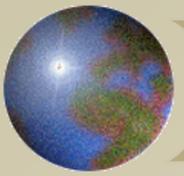
*38. Insertion of recombinant plasmids into plant cells by *Agrobacterium tumefaciens* infection will allow genetically altered plants to be created.*



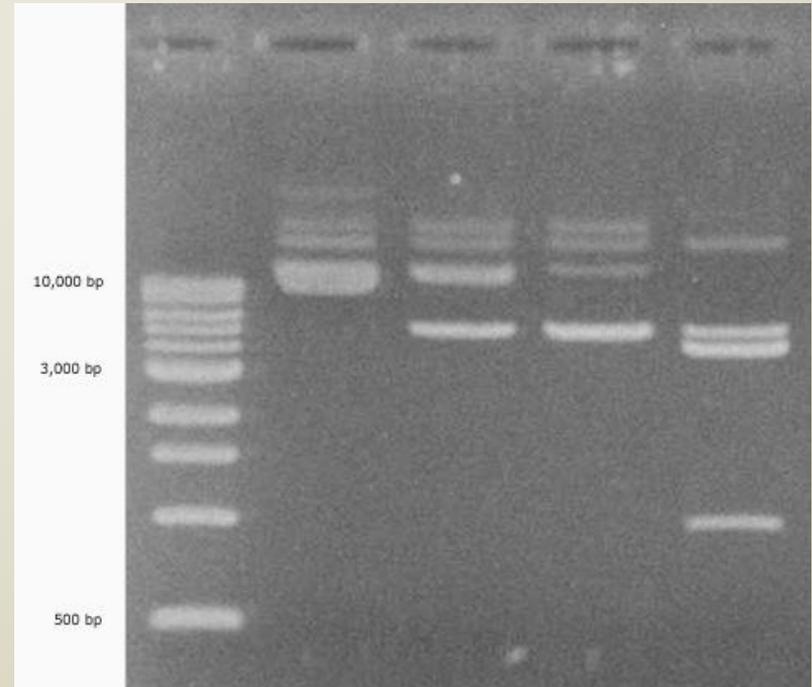
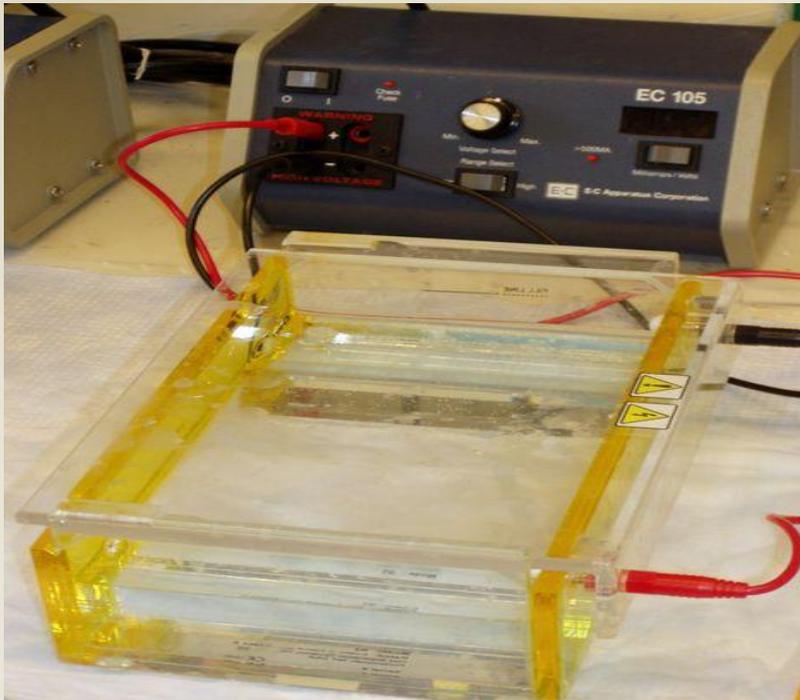


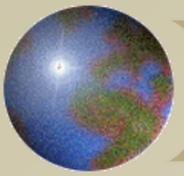
39. Recombinant viral DNA can be added to human cells using the process of transduction.





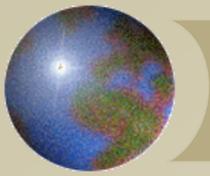
40. Electrophoresis is a technique used to separate fragments of cut DNA according to size.



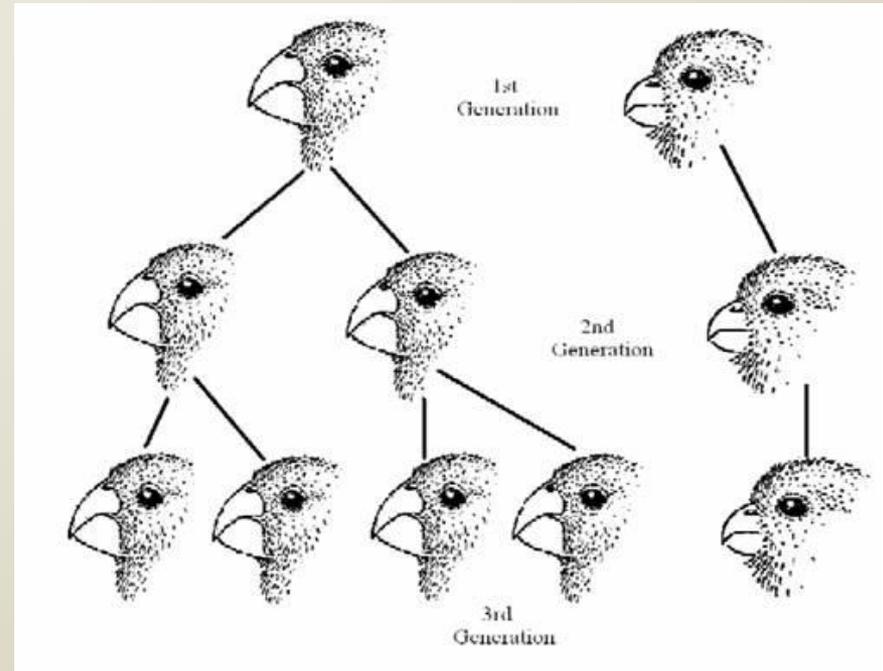
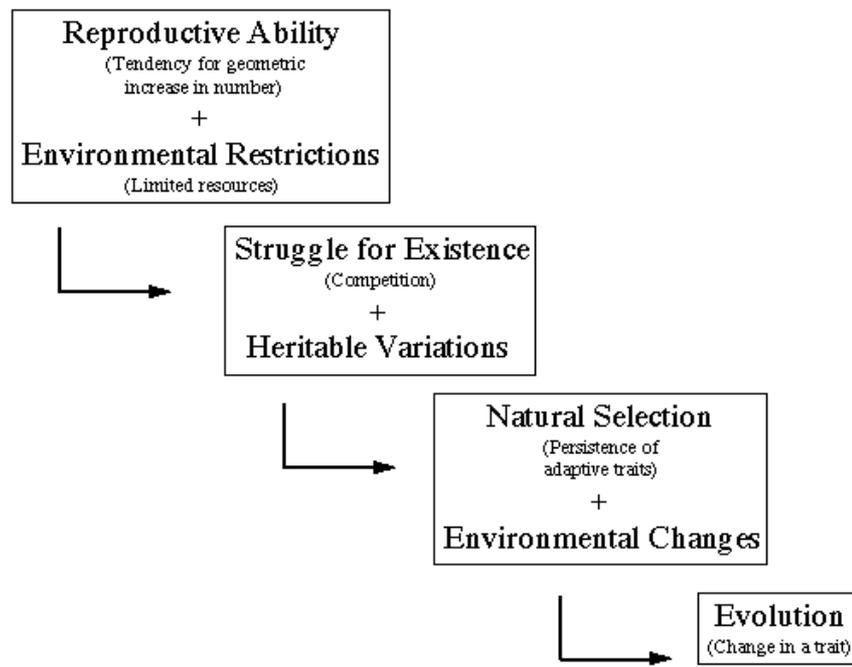


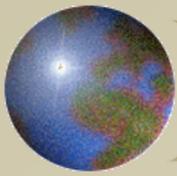
41. Organisms have different structural adaptations to carry out essential life functions.



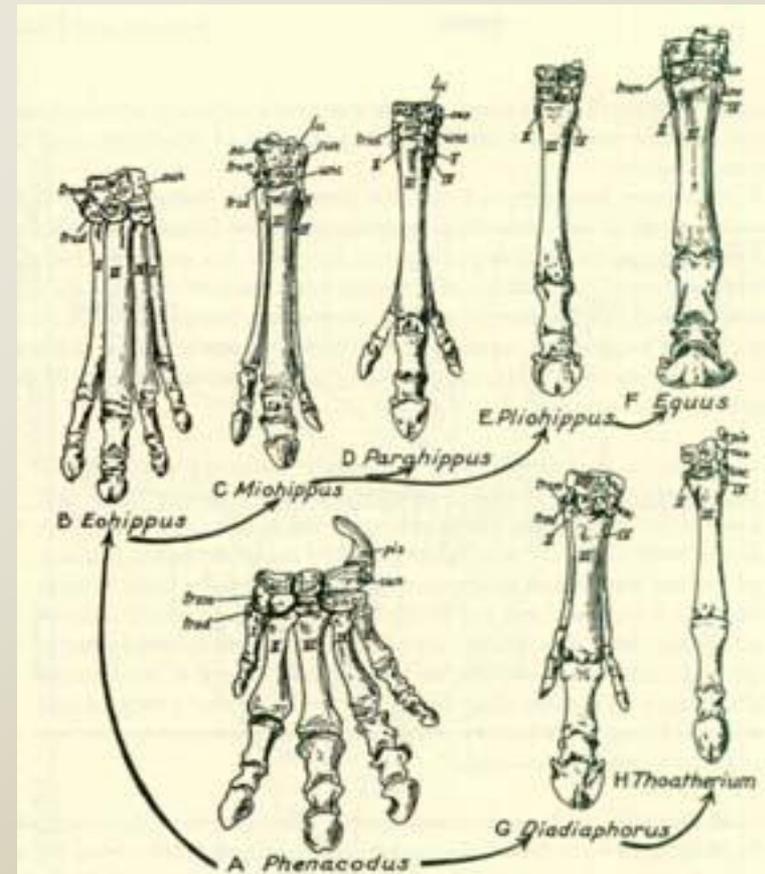
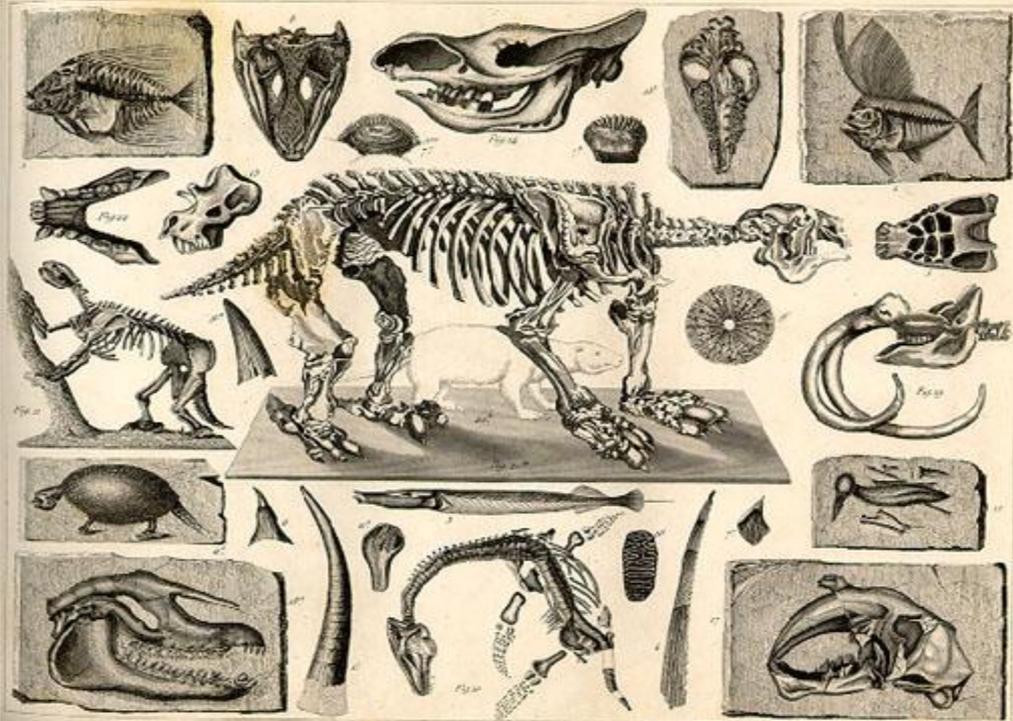


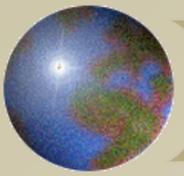
42. *Natural selection is the process that may lead to the evolution of new species.*



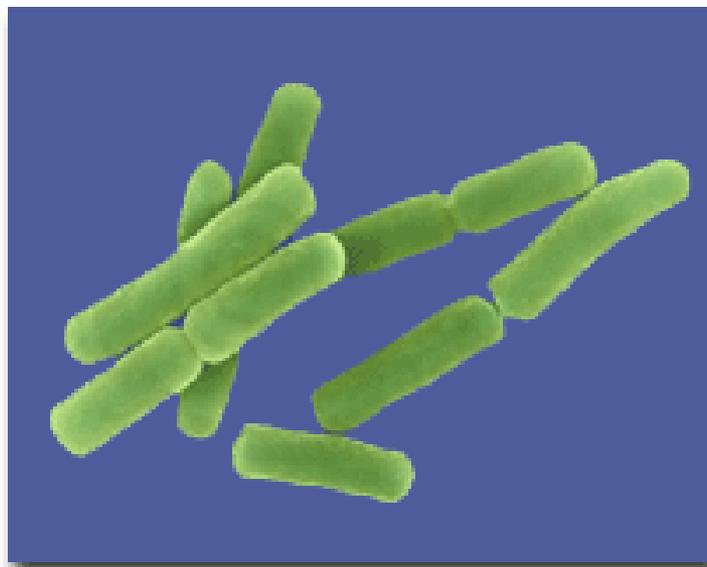


43. *The fossil record provides evidence that evolution has occurred.*

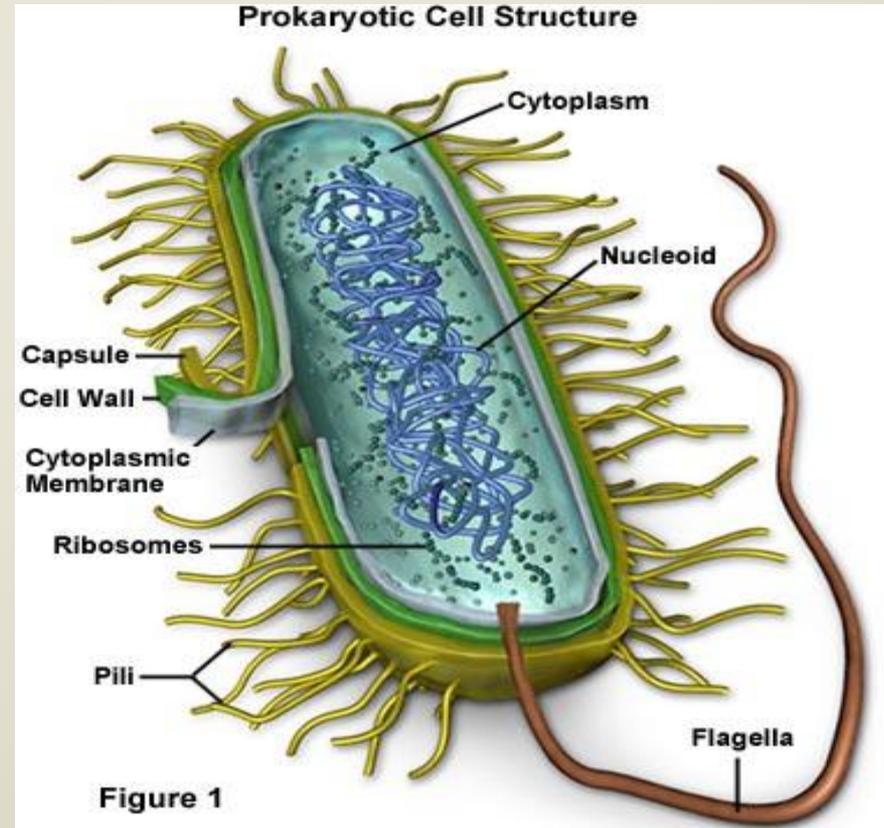


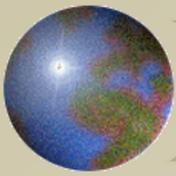


44. The first living organisms were single celled prokaryotic organisms.

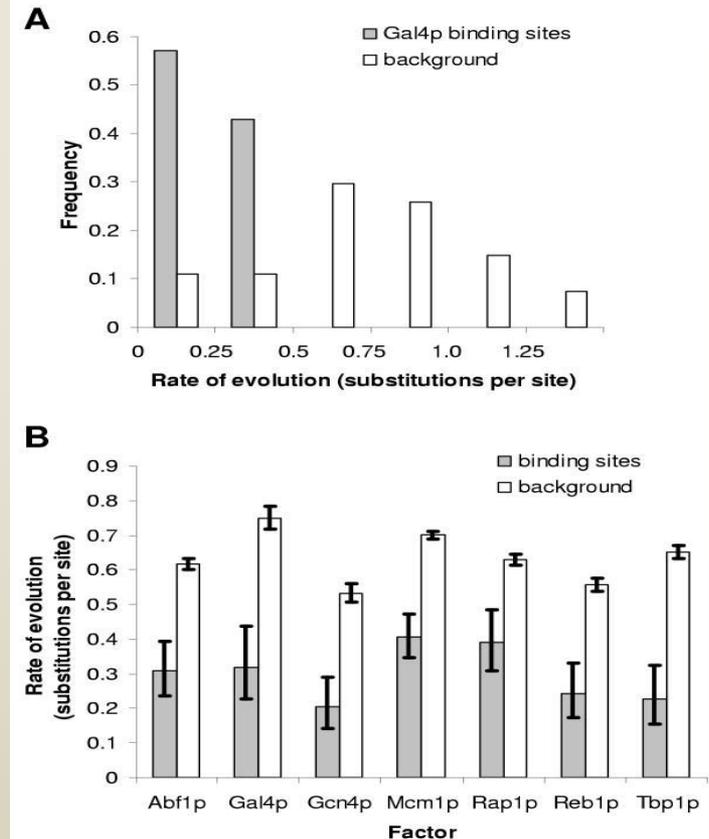
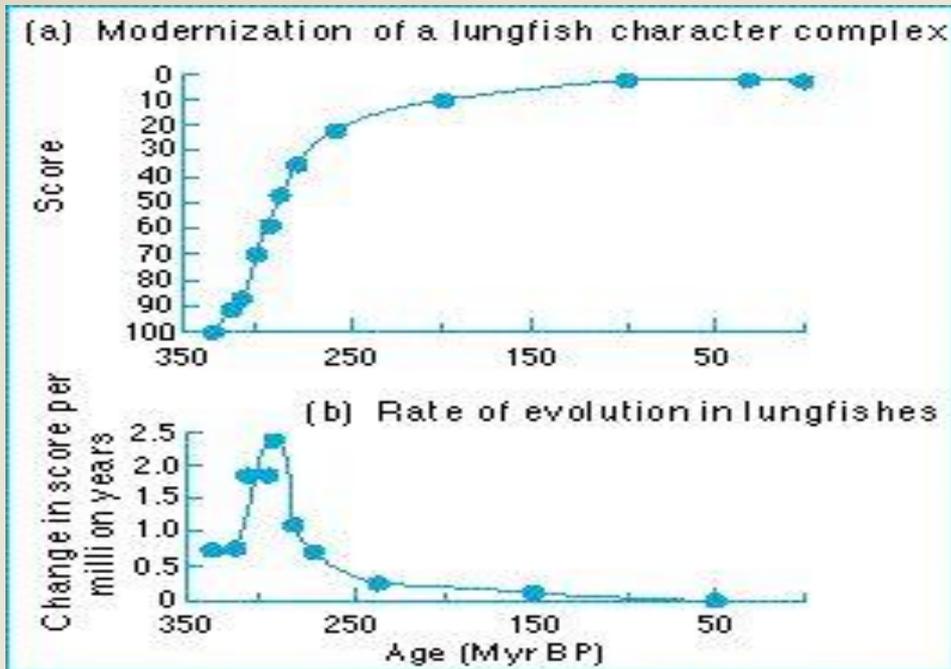


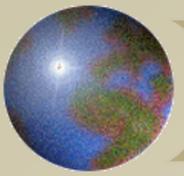
Bacillus Bacteria





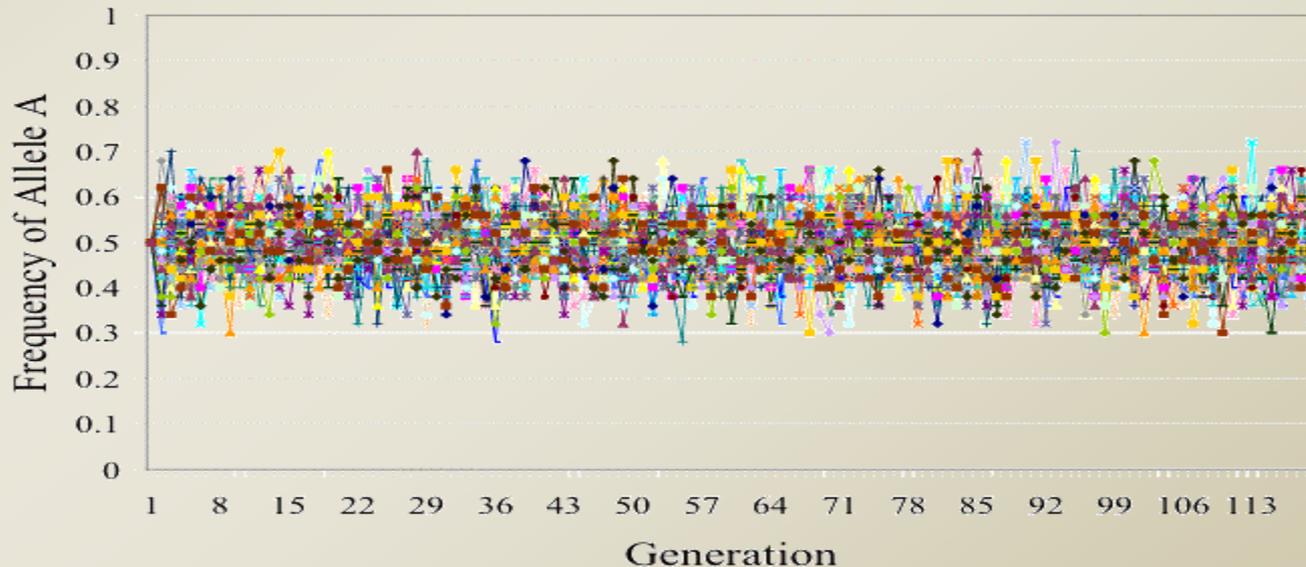
45. *The rate at which evolution occurs varies from organism to organism.*

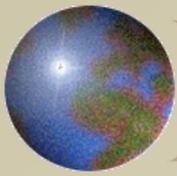




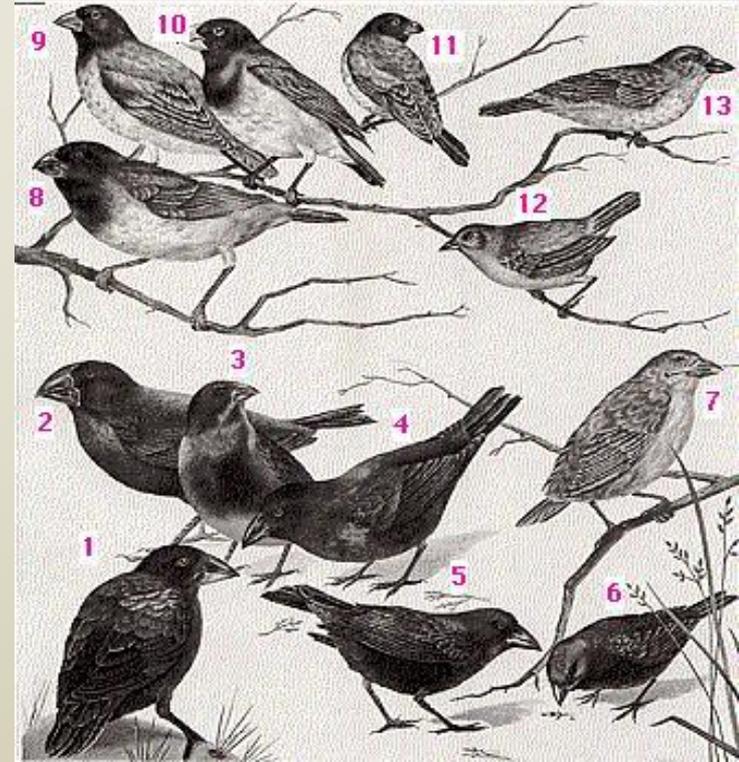
46. The allele frequency in a population is the percentage of alleles for a specific characteristics.

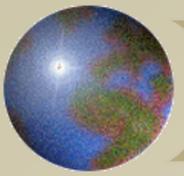
Genetic Drift Population Size 50



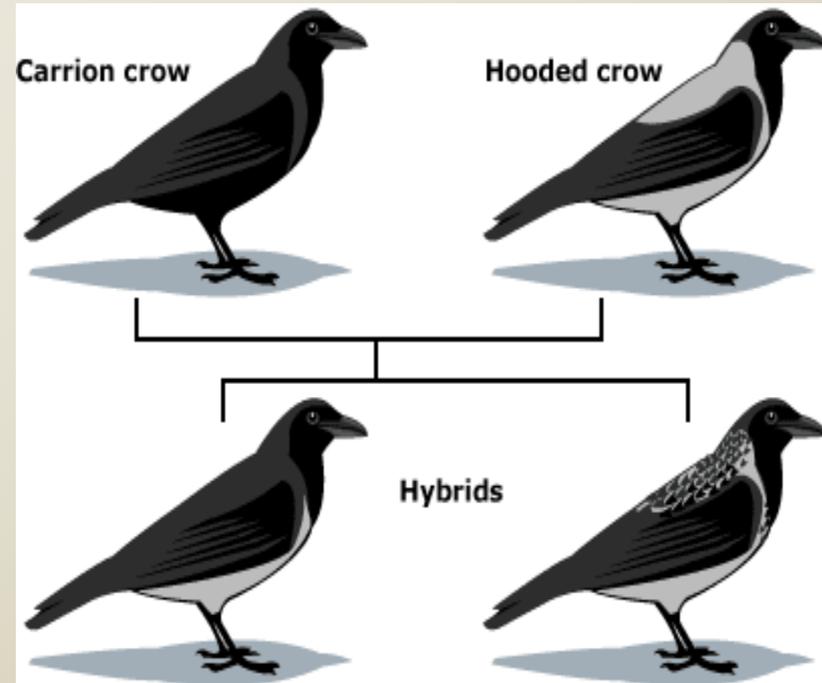


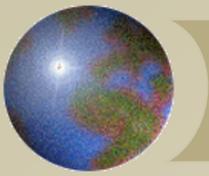
47. *When a small group of individuals is separated from the main population, they may evolve into a new species that is specialized for a different environment or become extinct.*



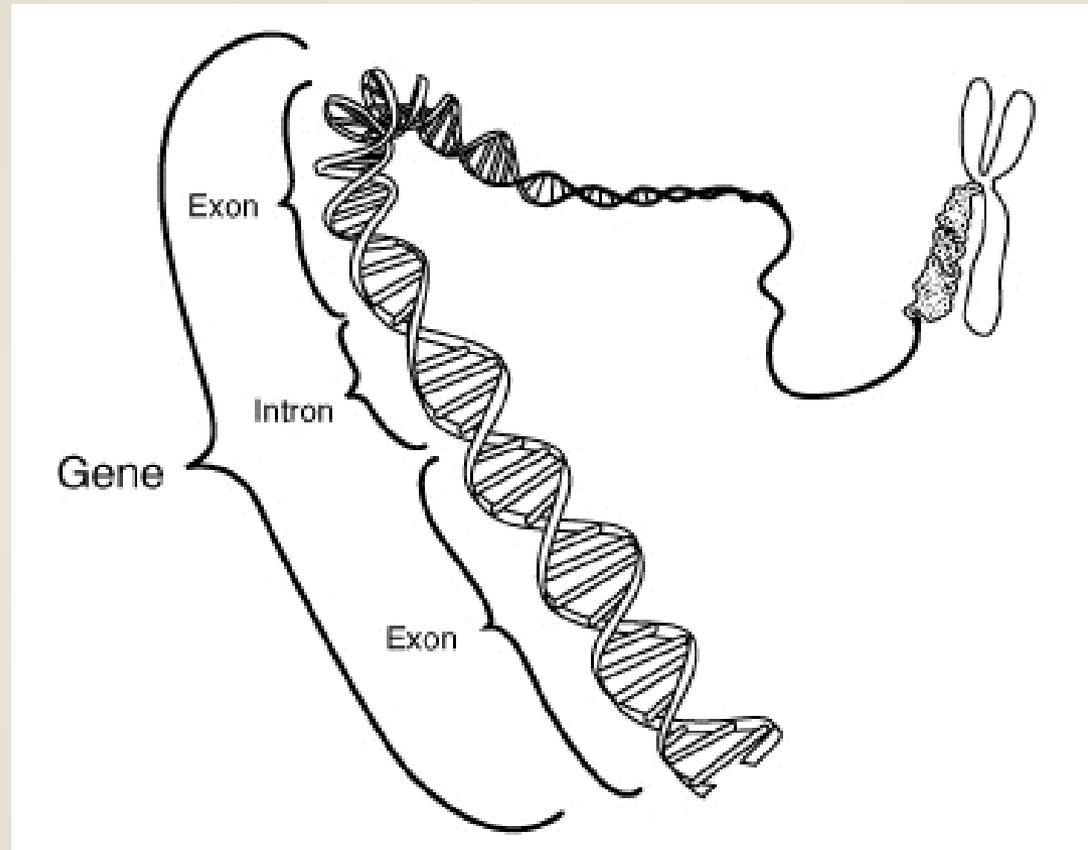
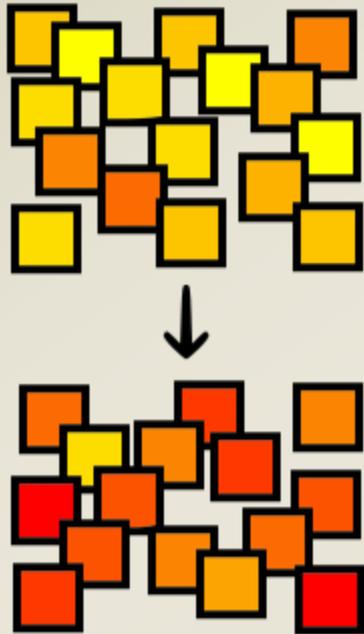


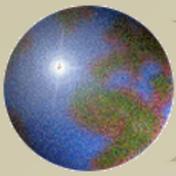
48. Changes in genes result in variation that lead to the formation of new species.





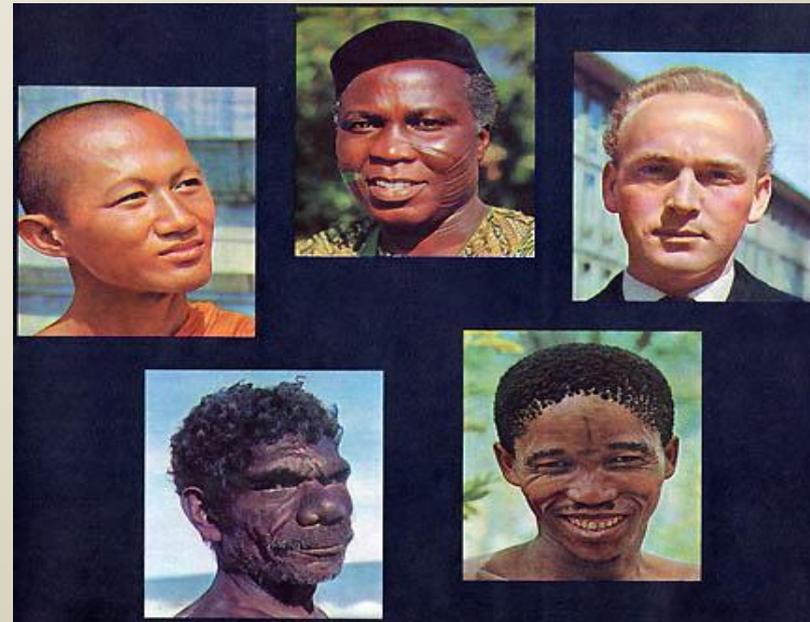
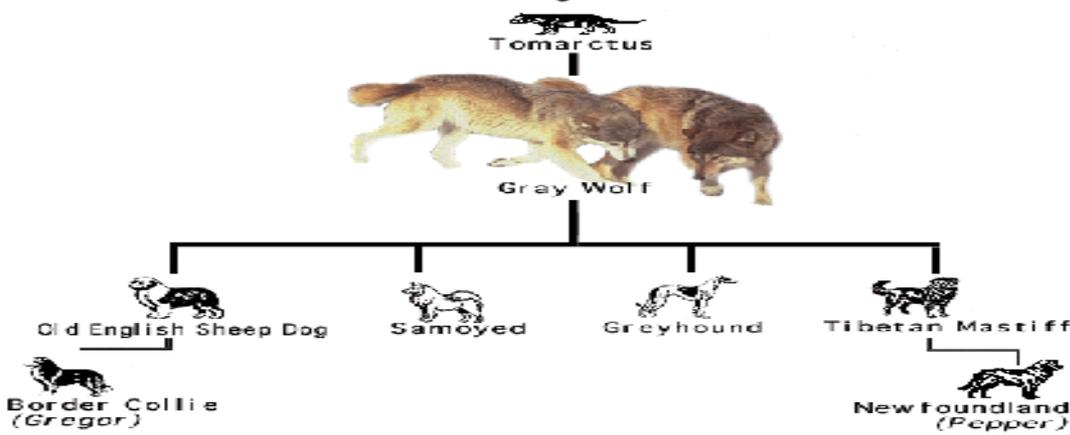
49. *Changes in genes make evolution possible.*

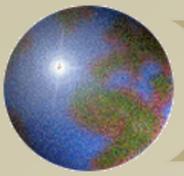




50. If a population has a wide range of variation due to genetic diversity, it gives the population an increased ability to adapt if the environment ever changes drastically.

Family Tree





51. Gradualism: evolution occurs at a slow and steady pace (Darwin).

EOLSS - PATTERNS AND RATES OF SPECIES EVOLUTION

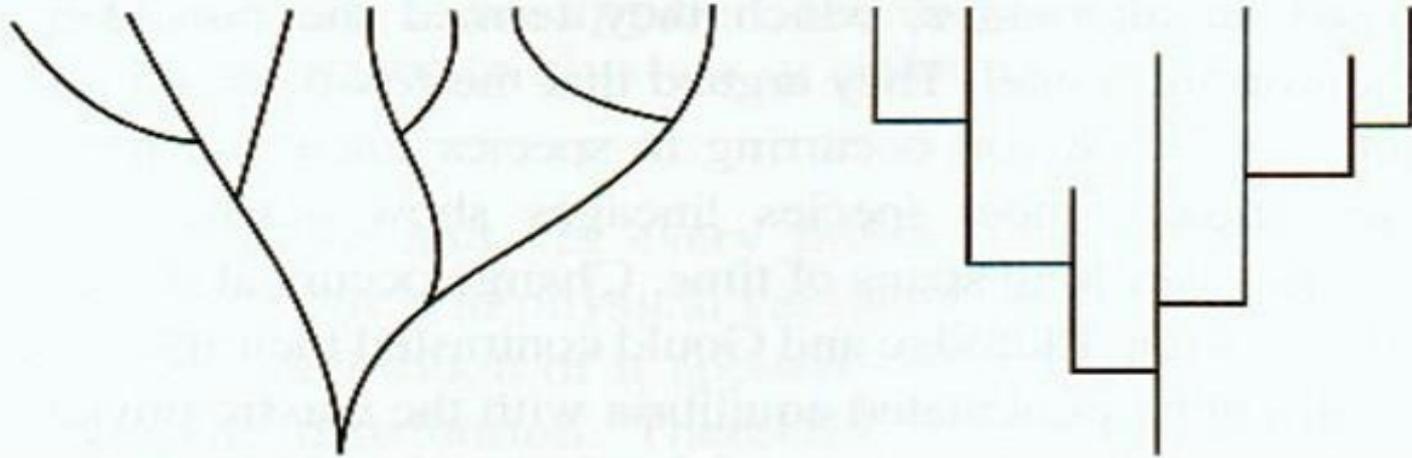
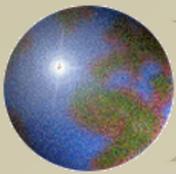


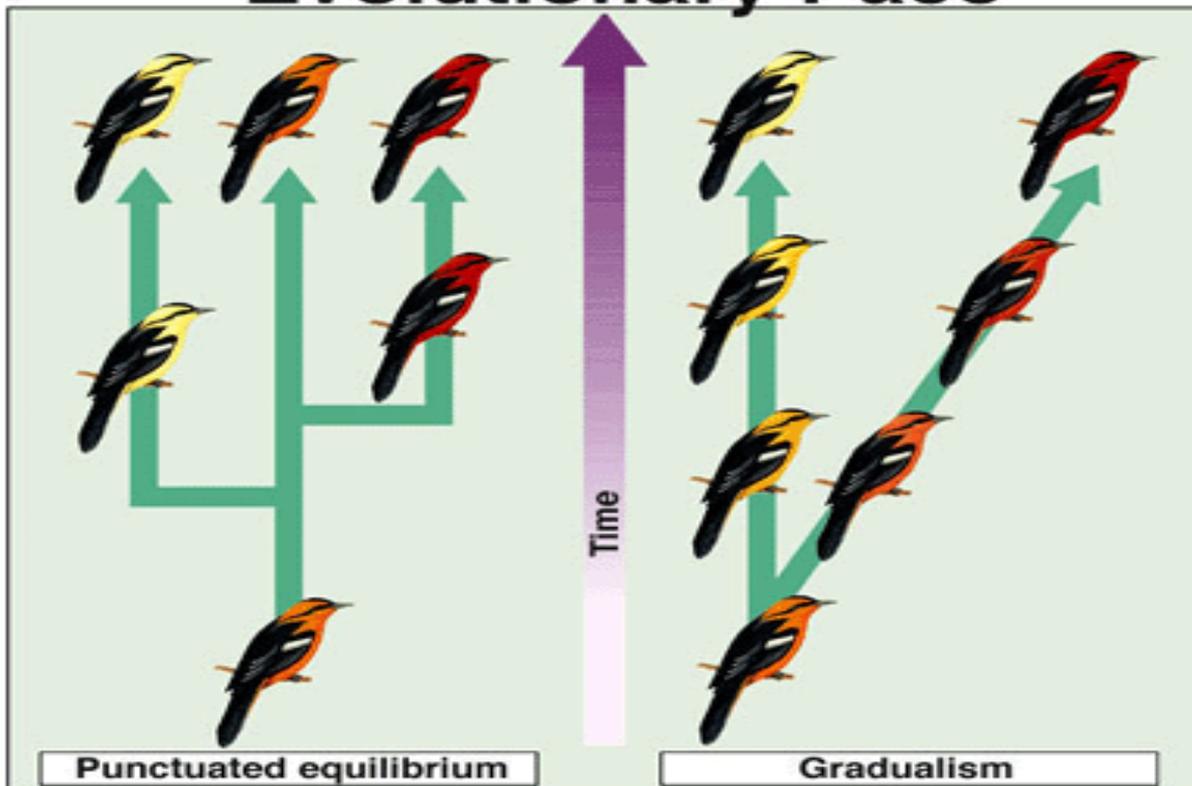
Fig. 3. Contrasting expectations of species-level evolution, the classic phyletic gradualism model (A), and the punctuated equilibrium model (B). Modified from various sources.

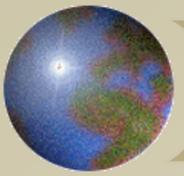


52. *Punctuated Equilibrium:*
evolution occurs rapidly with
interspersed periods of stability.

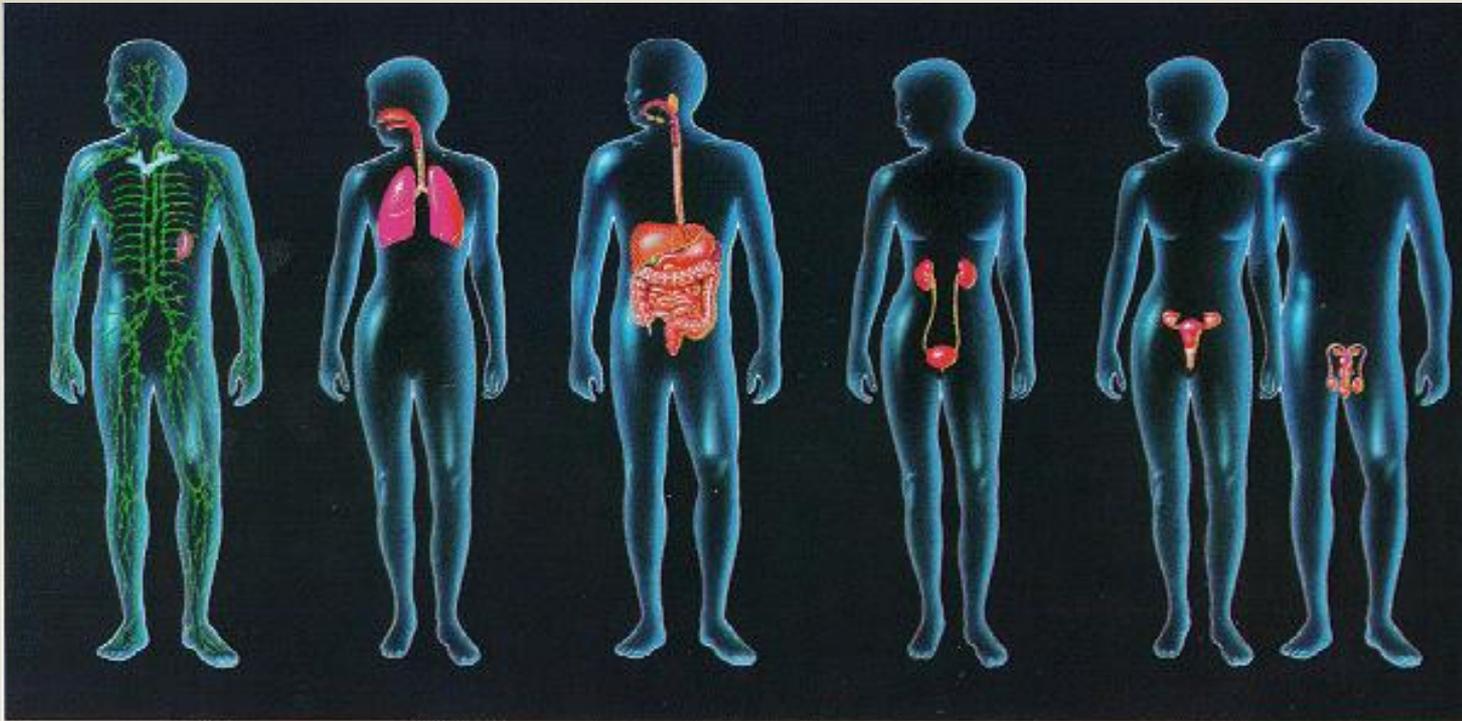
Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

Evolutionary Pace





53. Organs and systems in the human body help maintain homeostasis.



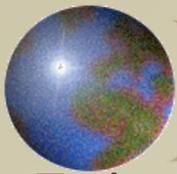
Lymphatic System

Respiratory System

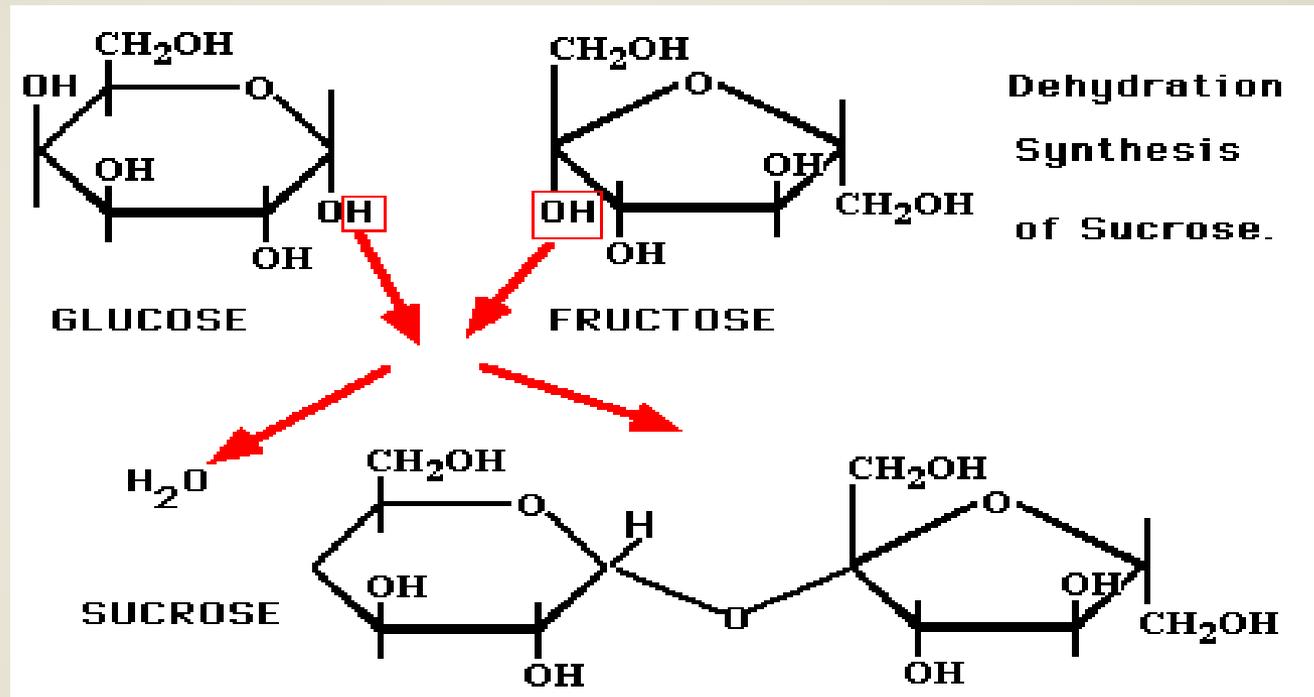
Digestive System

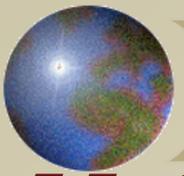
Urinary System

Reproductive System

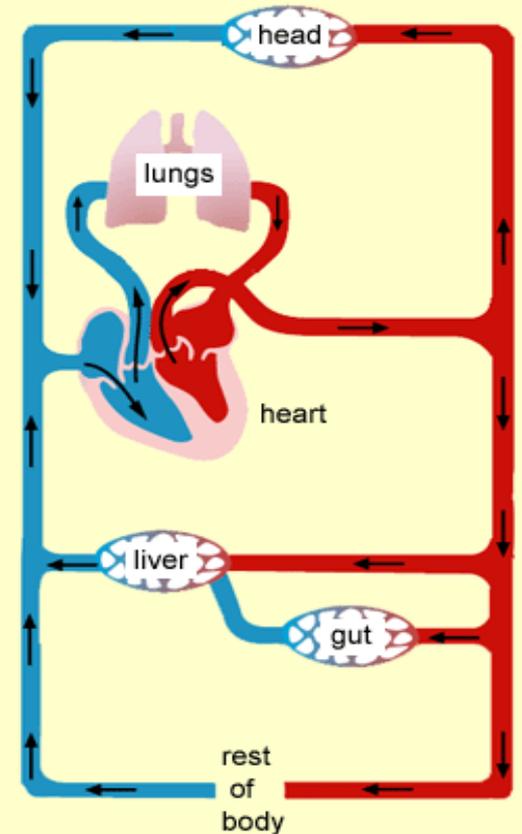


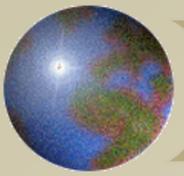
54. *Enzymes in the digestive system are responsible for the hydrolysis (breaking down) of carbohydrates, proteins, and lipids.*



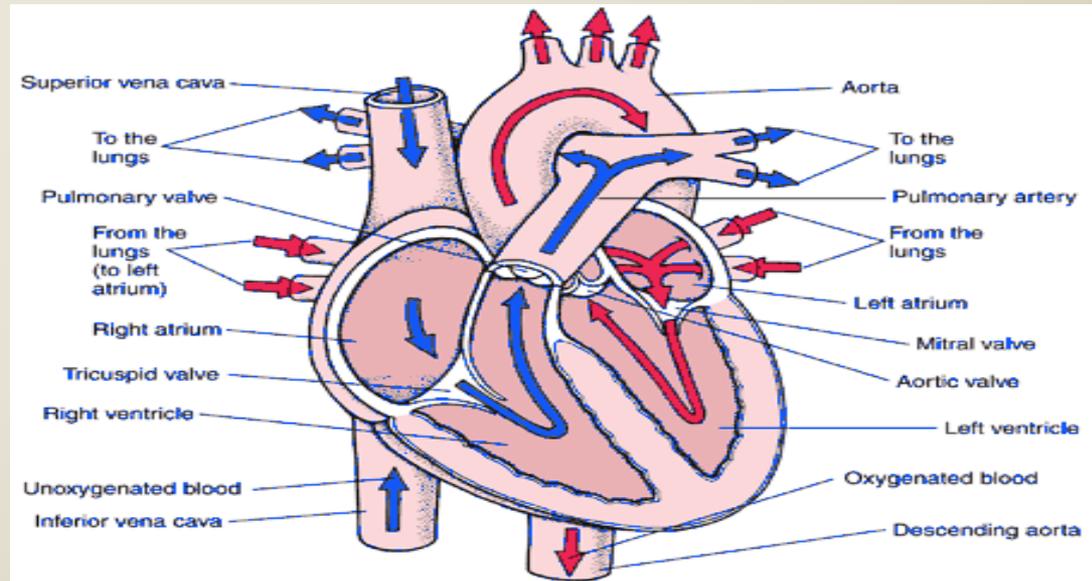


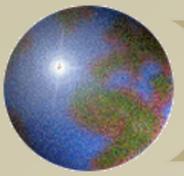
55. *The circulatory system is responsible for moving plasma and cells to all regions of the body through the blood vessels, while the lymphatic system moves water and small molecules to each individual cells.*



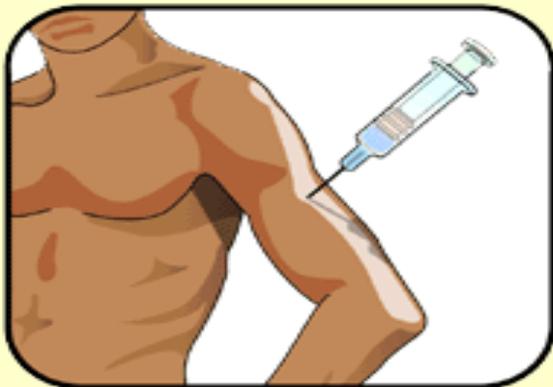
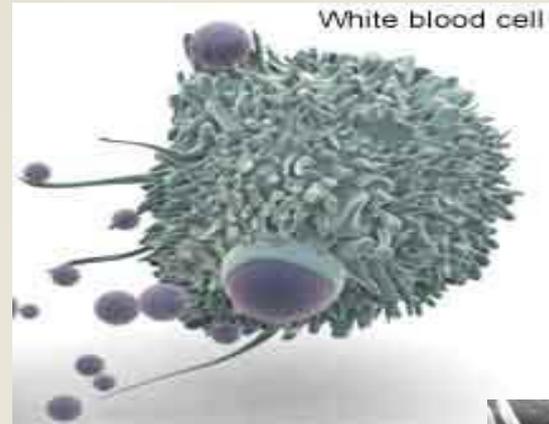


56. *The right side of the heart is the pump that moves deoxygenated blood to the lungs and the left side of the heart is the pump that moves oxygenated blood to the body's cells.*

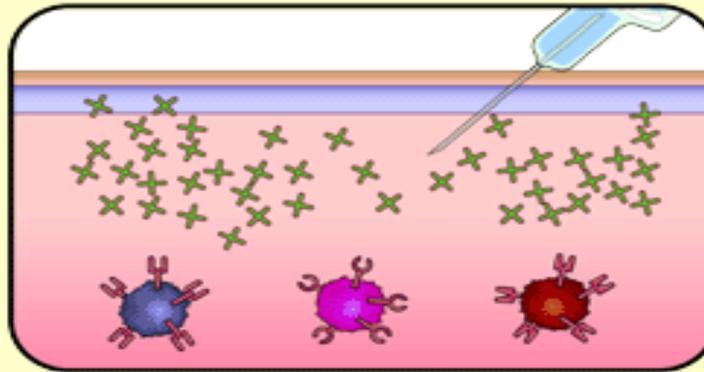




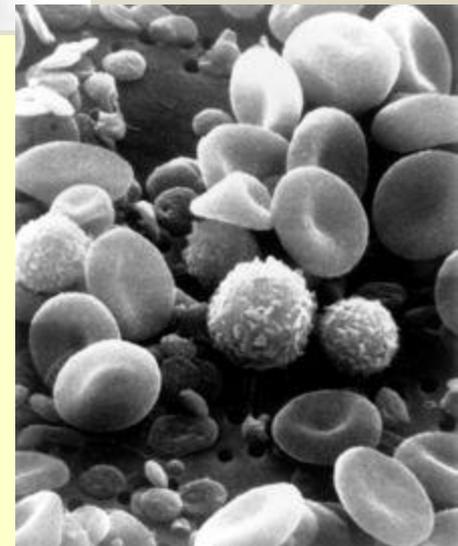
57. *White blood cells fight pathogens in the body.*

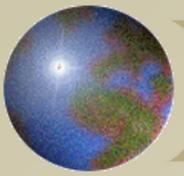


1 Weakened or harmless version of pathogen is introduced into your body

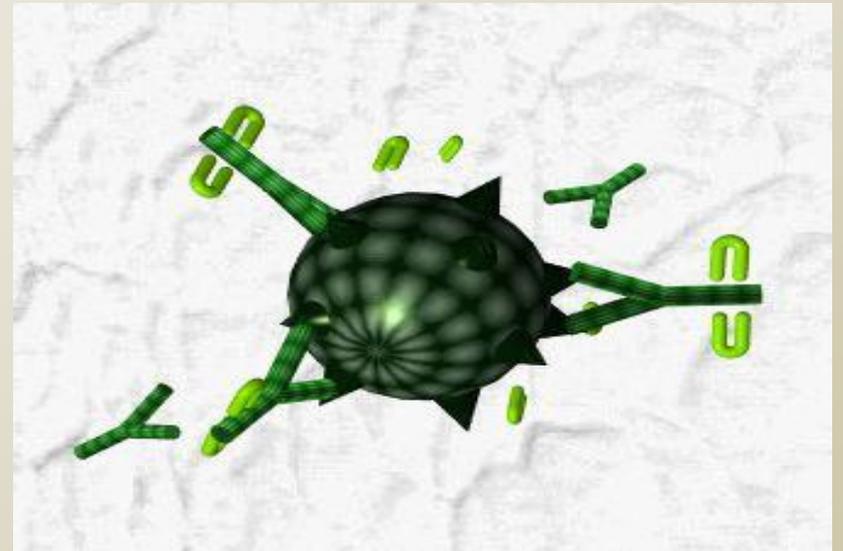
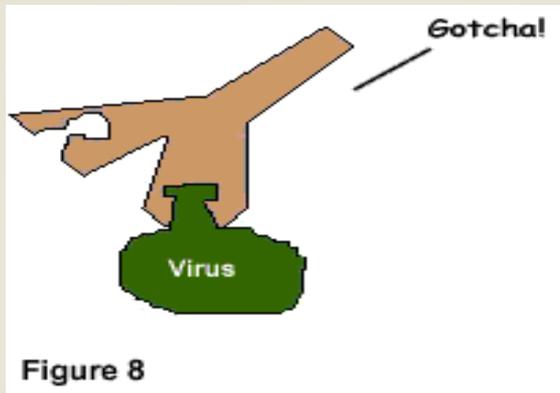


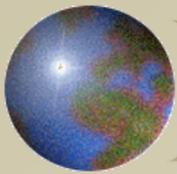
2 White cells respond to presence of pathogens



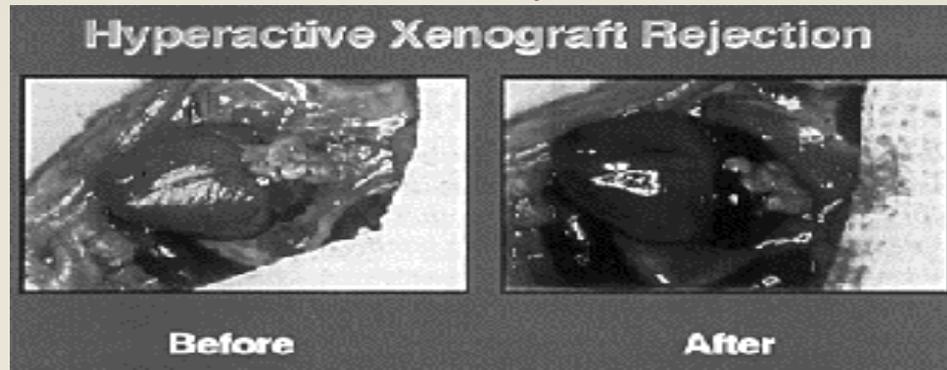


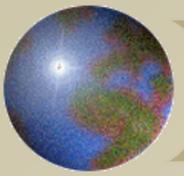
58. Antibodies are proteins produced by white blood cells in the human body that attach to invading pathogens and clump them together: antigen-antibody complex.



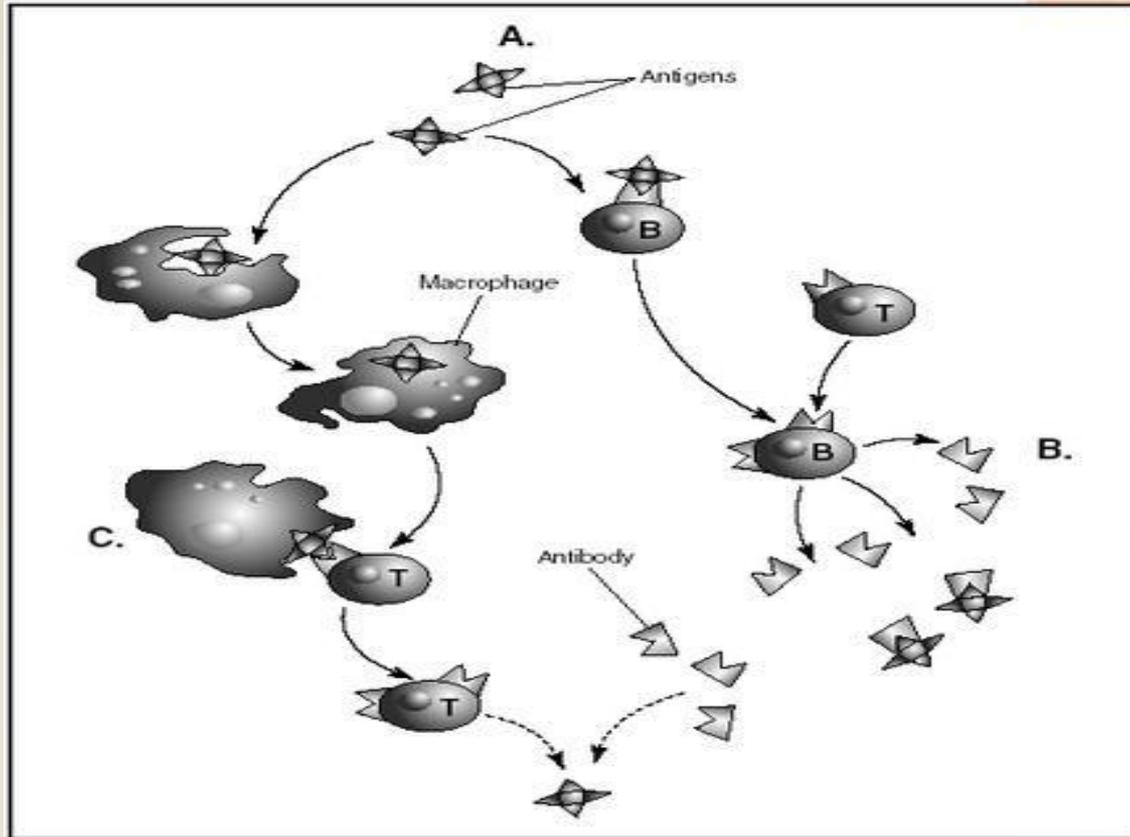


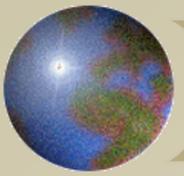
59. *When a person gets an organ transplant, the cells of the implanted organ are recognized as foreign invading cells by the recipient's immune system.*



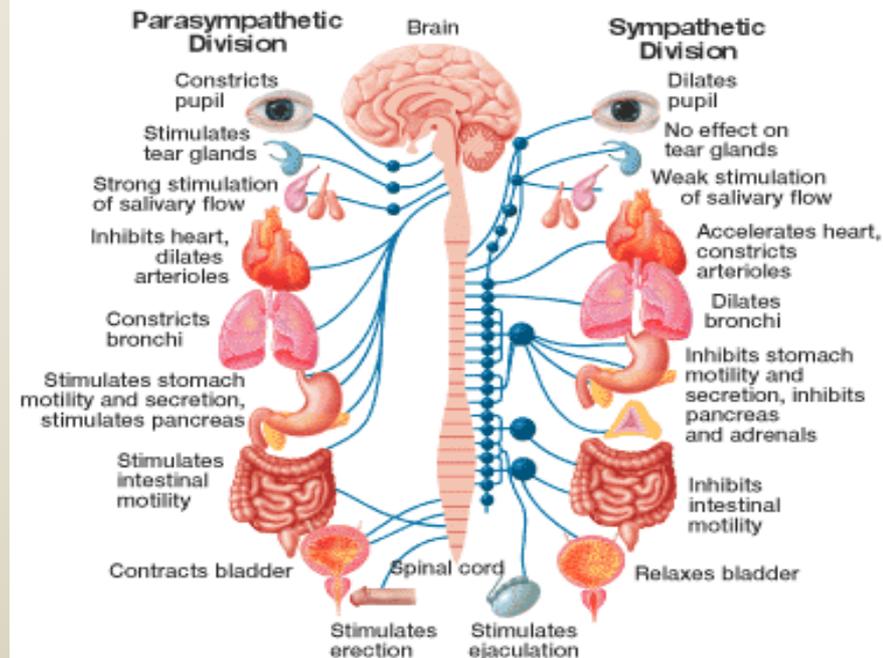
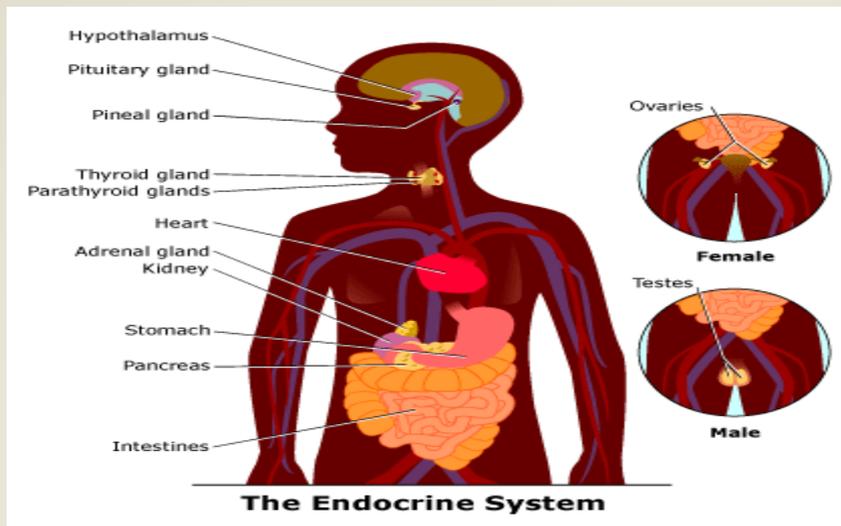


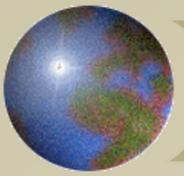
60. *Vaccines are weakened forms of pathogen or a protein from the pathogen's surface.*



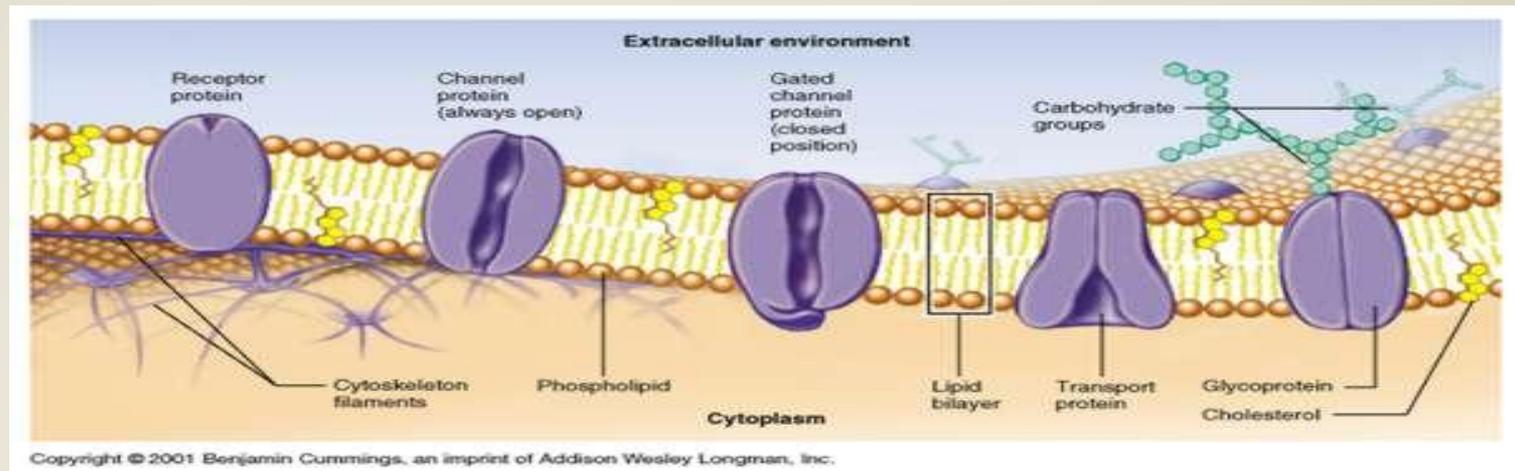


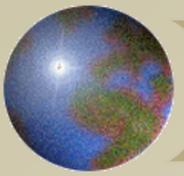
61. The nervous system and endocrine system allow cells within multicellular organisms to communicate and coordinate their actions.



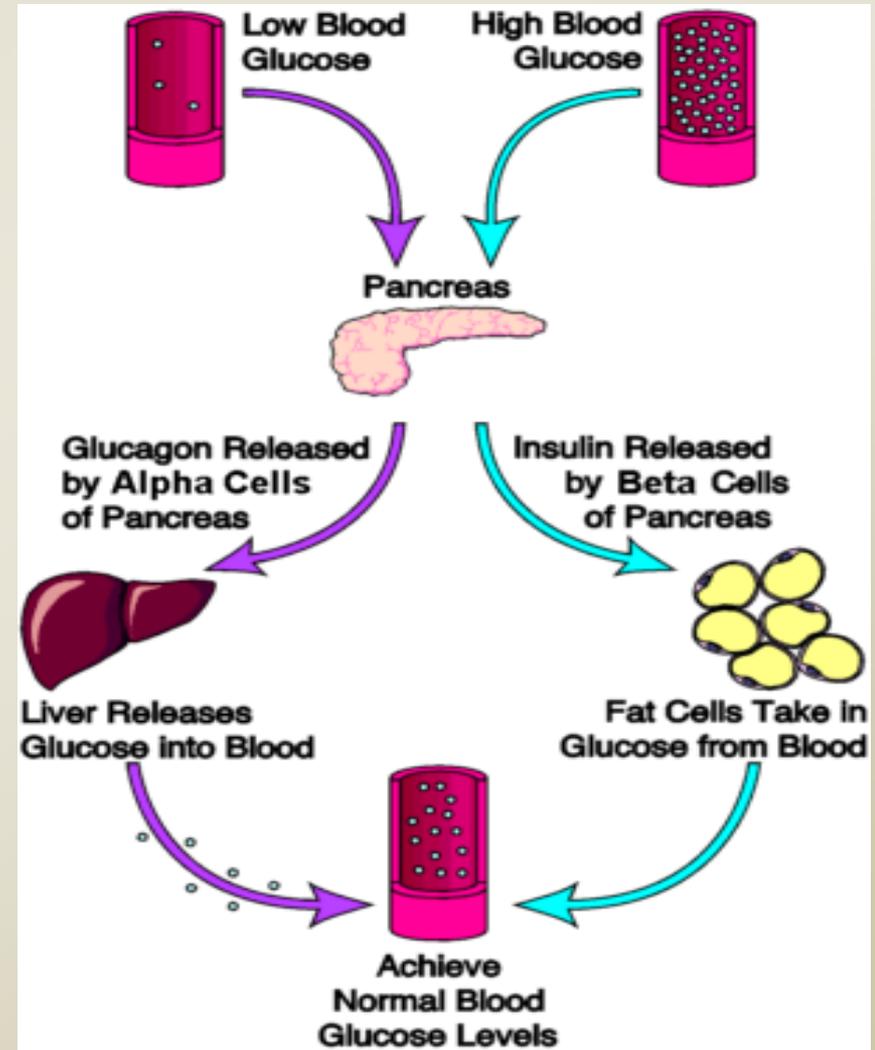


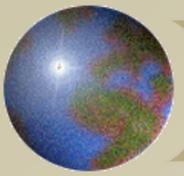
62. Hormones are specific chemical messenger molecules that travel through the blood and attach to receptor proteins on the surface of target cells.



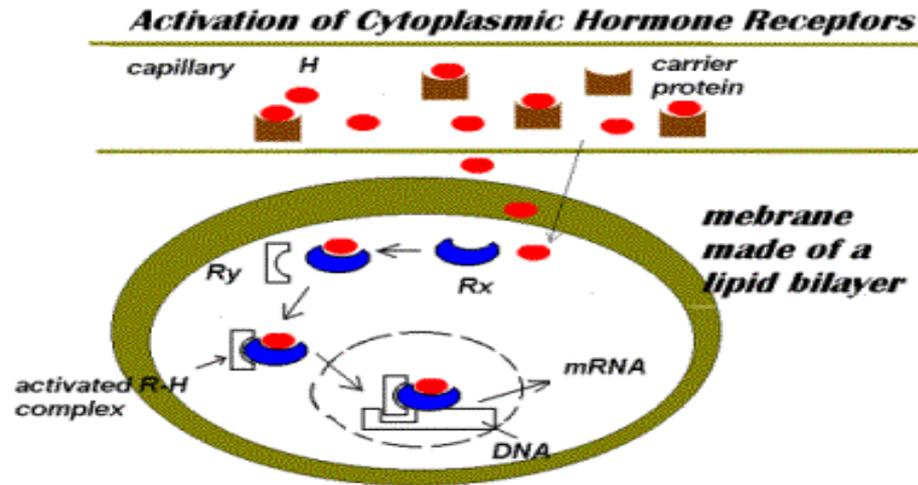


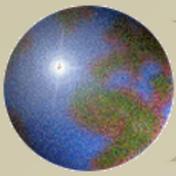
63. *The hormone insulin is secreted from the pancreas and lowers the glucose level in the blood.*



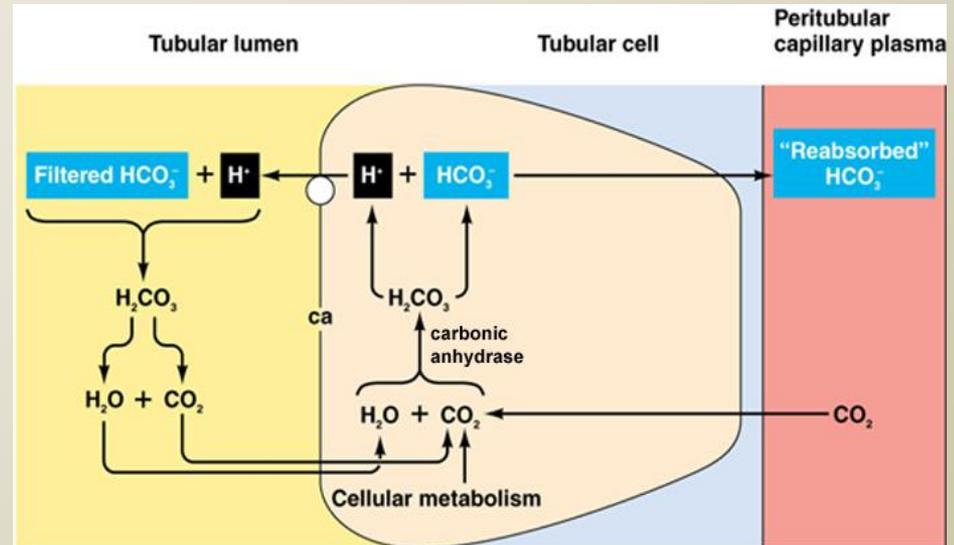
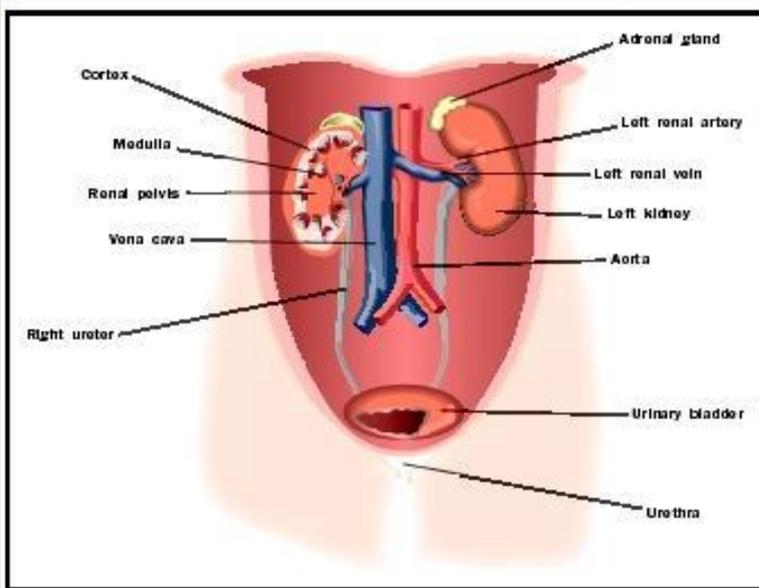


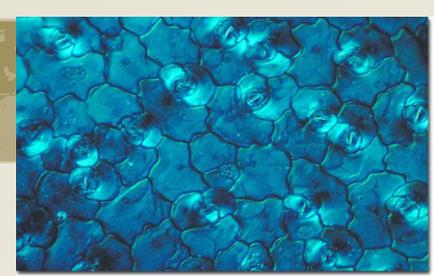
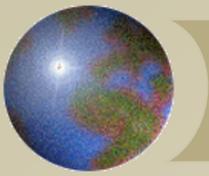
64. *Hormonal feedback mechanisms maintain homeostasis in the human body.*



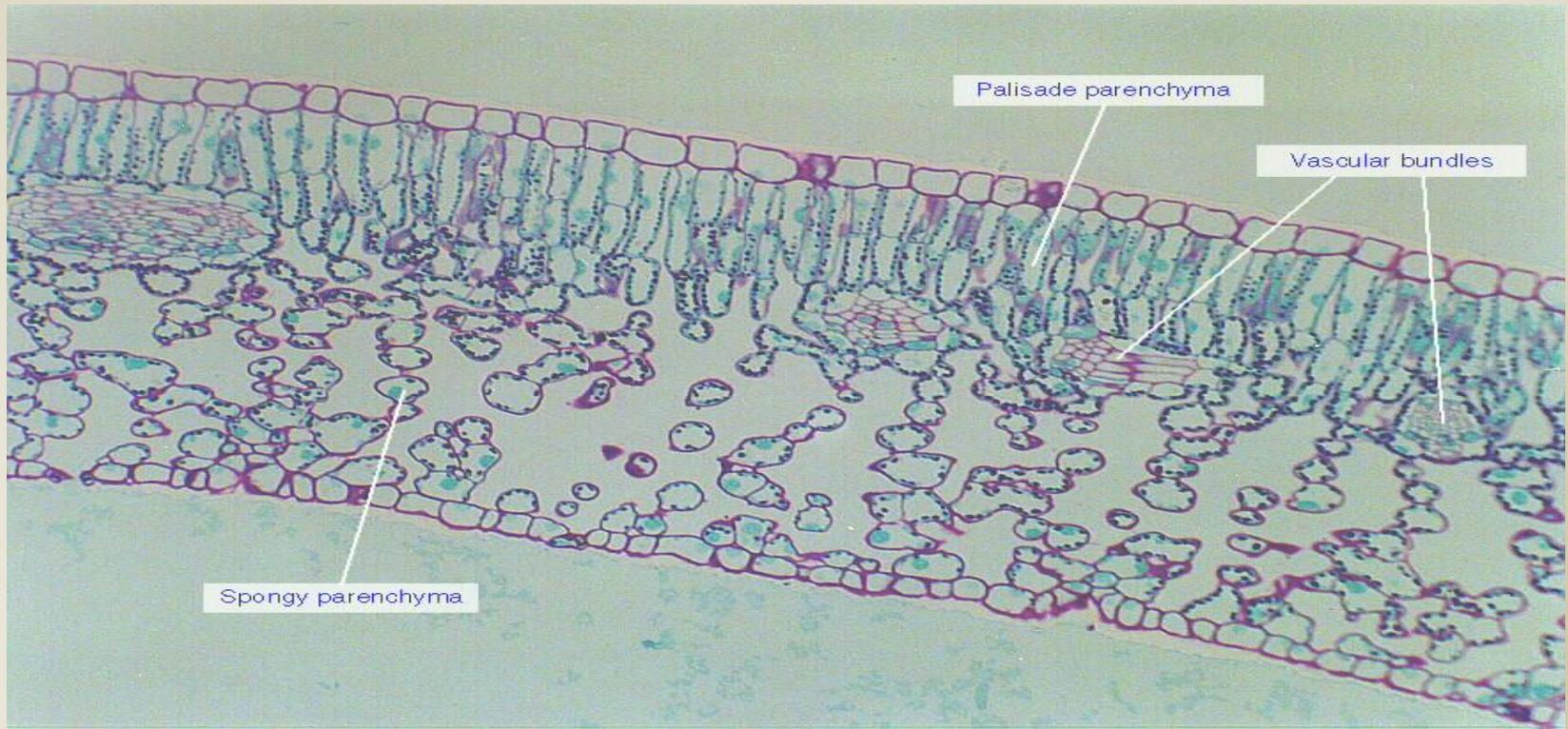


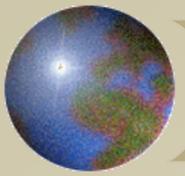
65. The kidneys regulate urine composition and water balance in the blood by filtering and reabsorbing molecules.



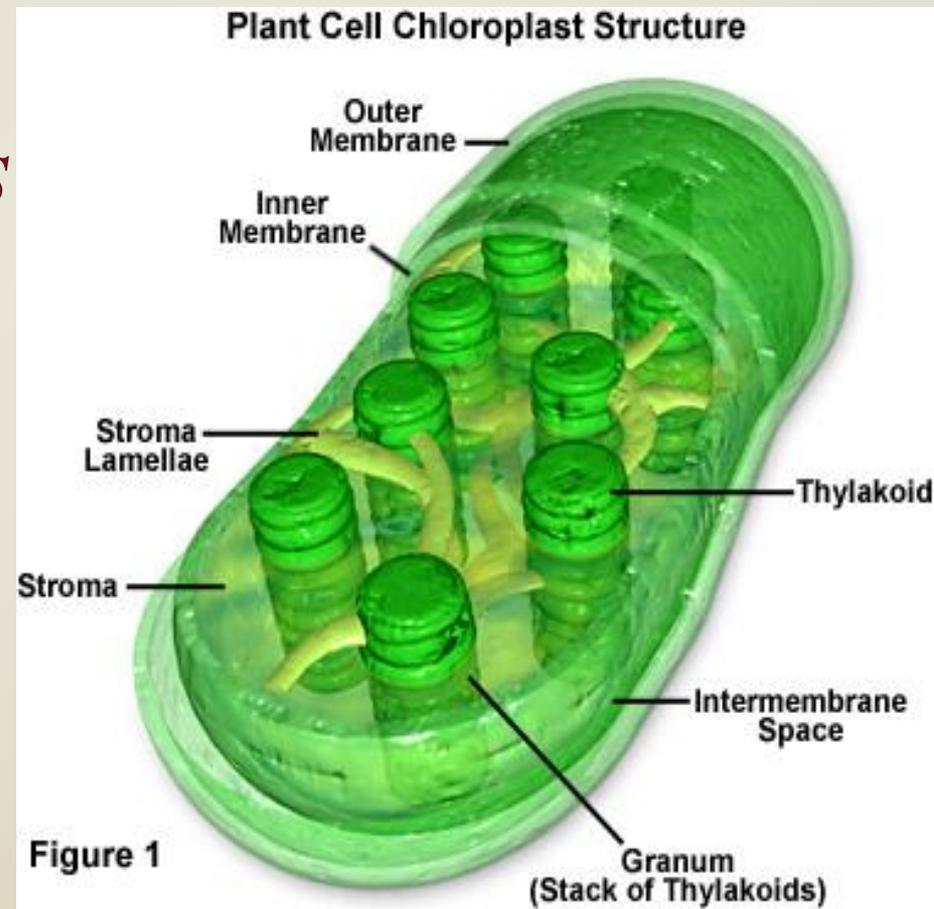


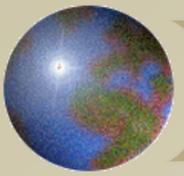
66. Stomates maintain homeostasis in leaves by regulating gas exchange and water loss.



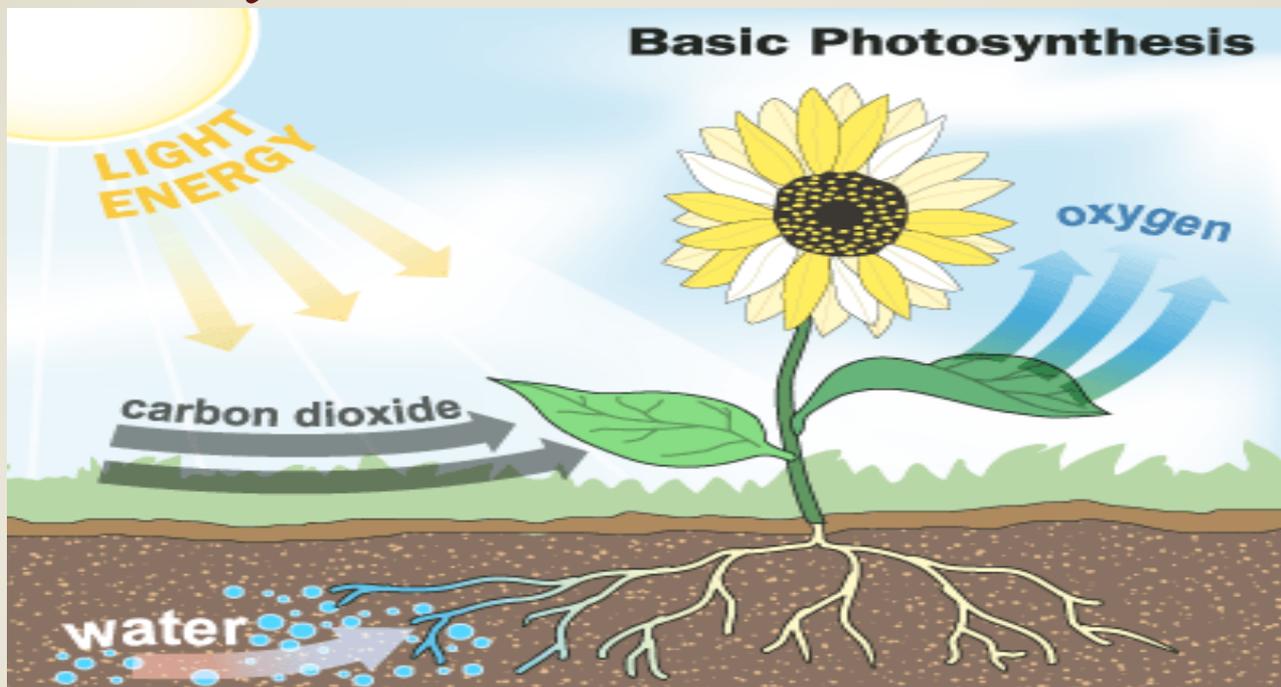


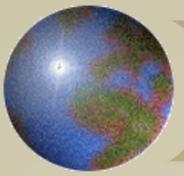
67. Chlorophyll molecules in chloroplasts capture light energy from the sun to power the process of photosynthesis.



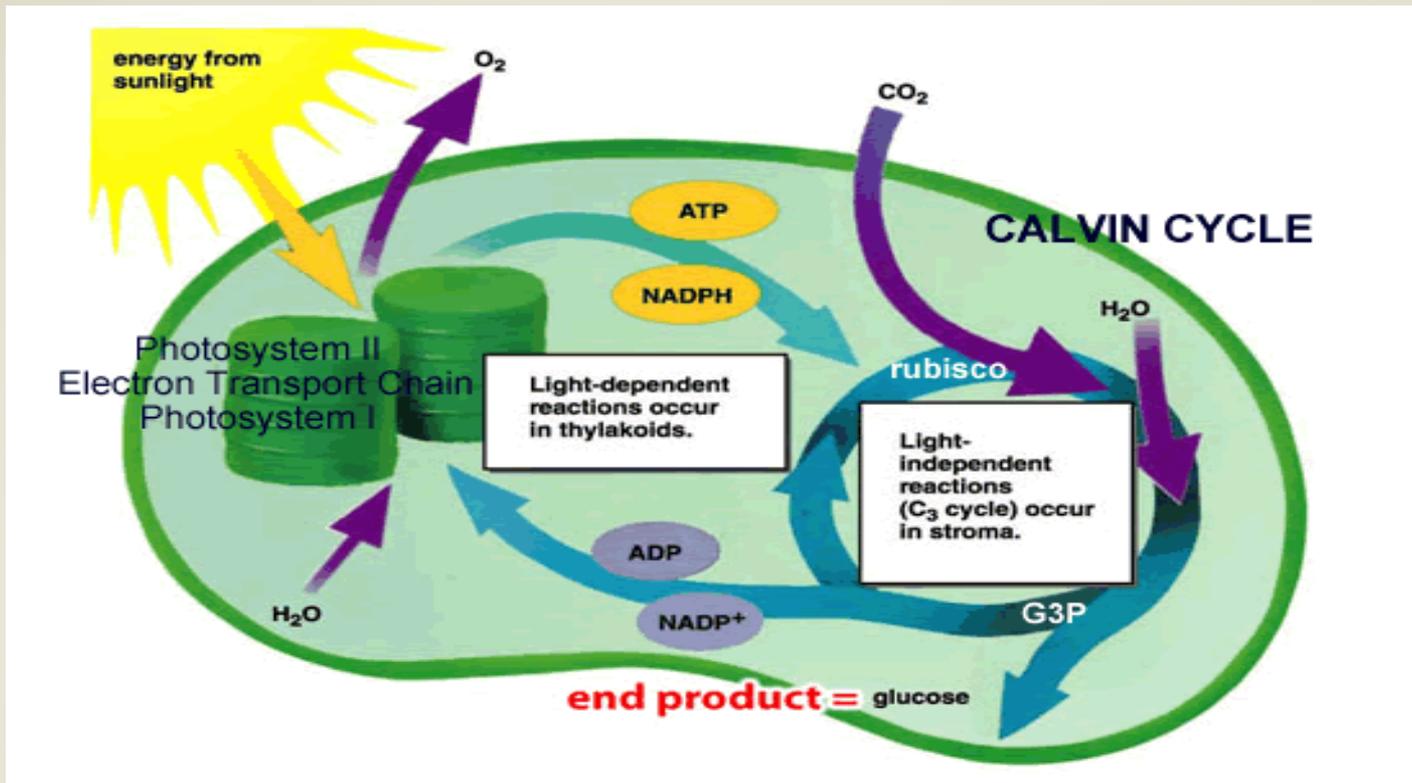


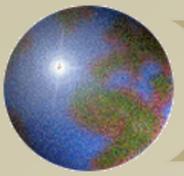
68. *Carbon dioxide gas is consumed in photosynthesis, while excess oxygen gas is produced in photosynthesis.*



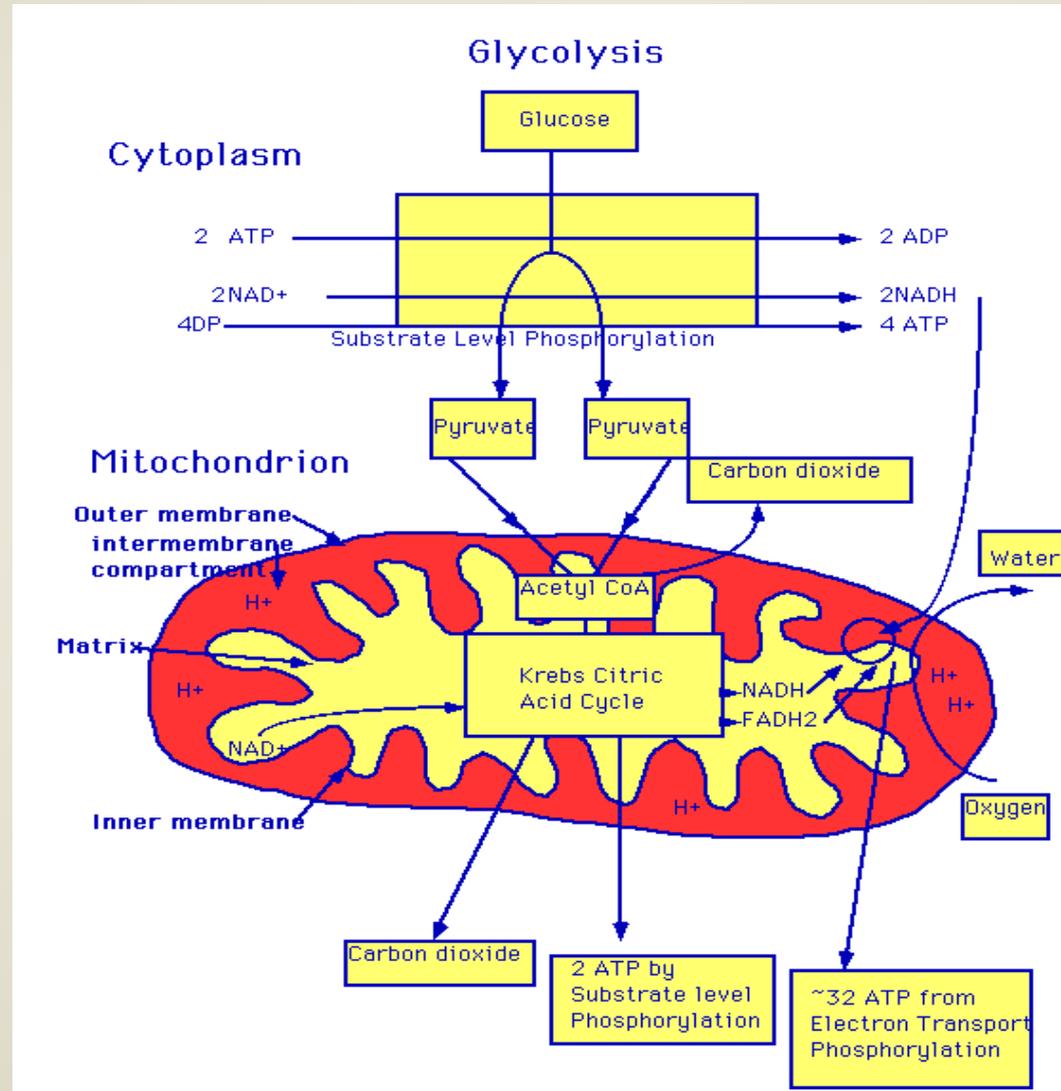


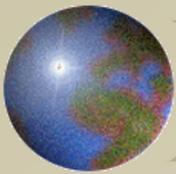
69. Glucose is the first stable product of photosynthesis and serves as a food source within cells.





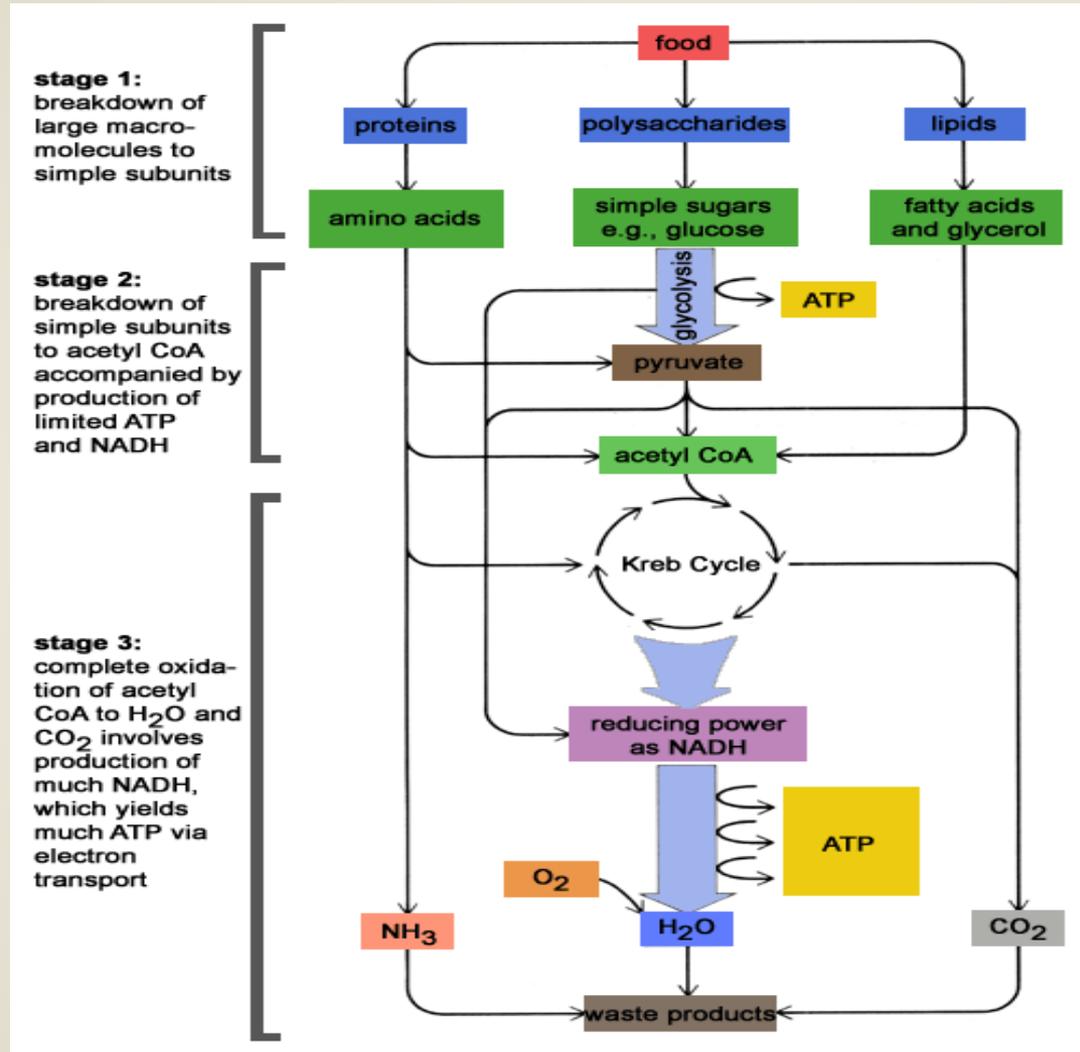
70. Cellular Respiration is the process of producing ATP energy from glucose and oxygen in mitochondria.

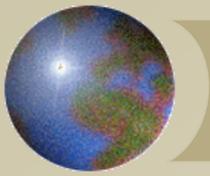




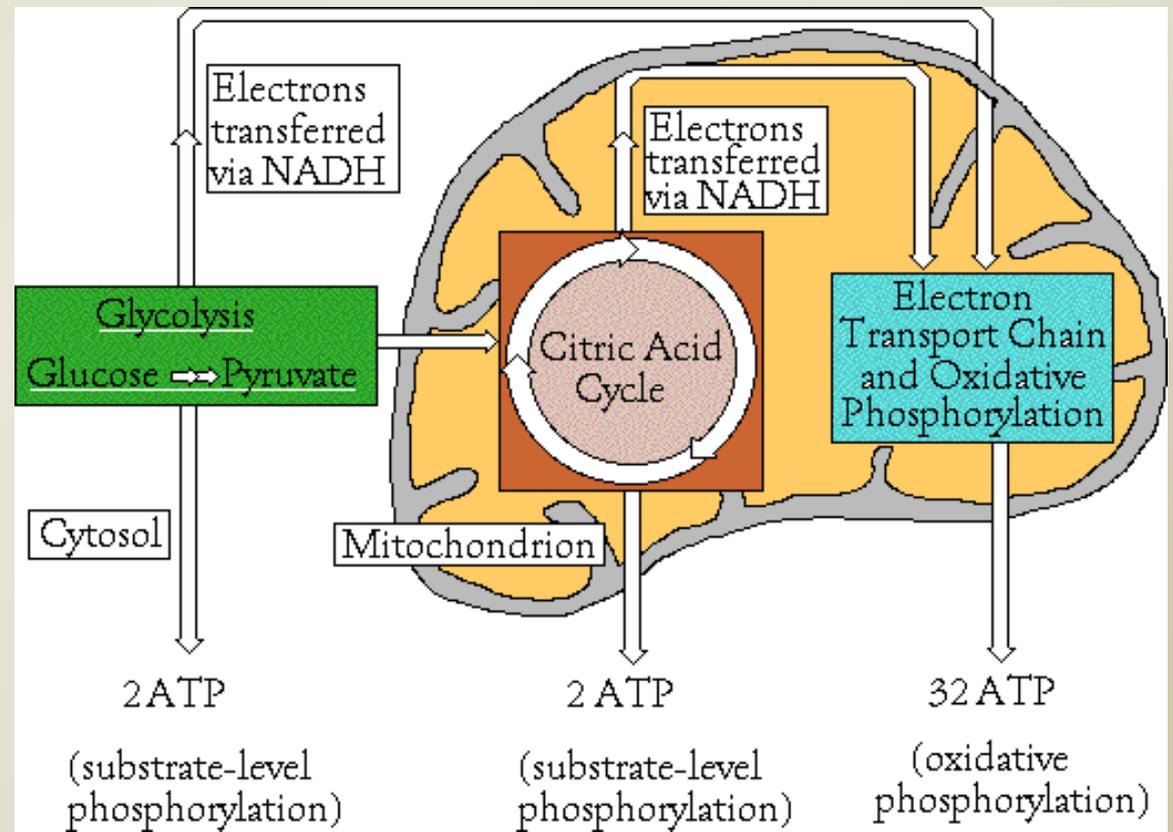
71. Carbon dioxide is the waste gas

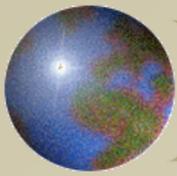
produced in cellular respiration and excreted through the lungs.





72. All organisms carry on respiration to breakdown glucose and produce ATP energy molecules.

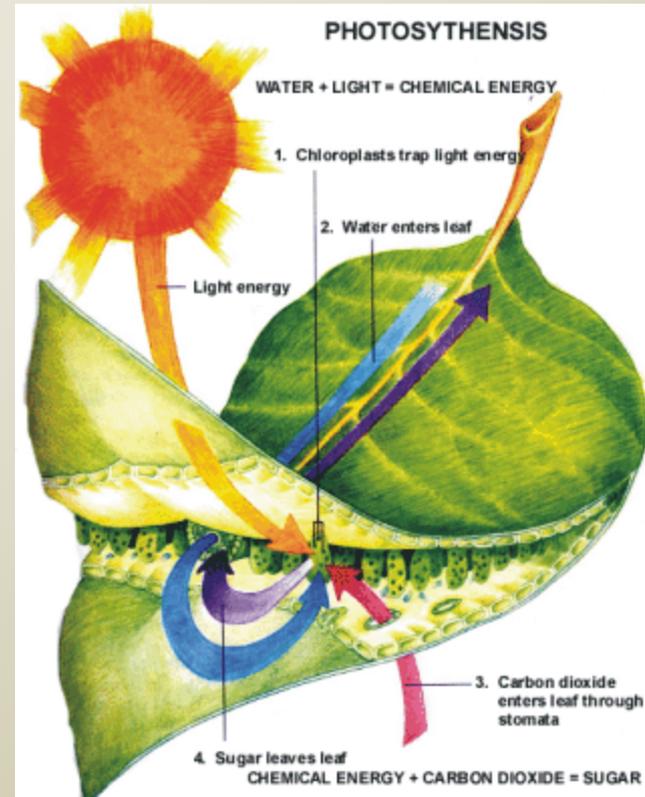


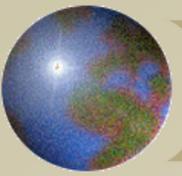


73. Photosynthesis and respiration are responsible for the stable levels of oxygen and carbon dioxide in the Earth's atmosphere.

Aerobic respiration:

**Glucose + Oxygen = Carbon Dioxide +
Water + Energy**

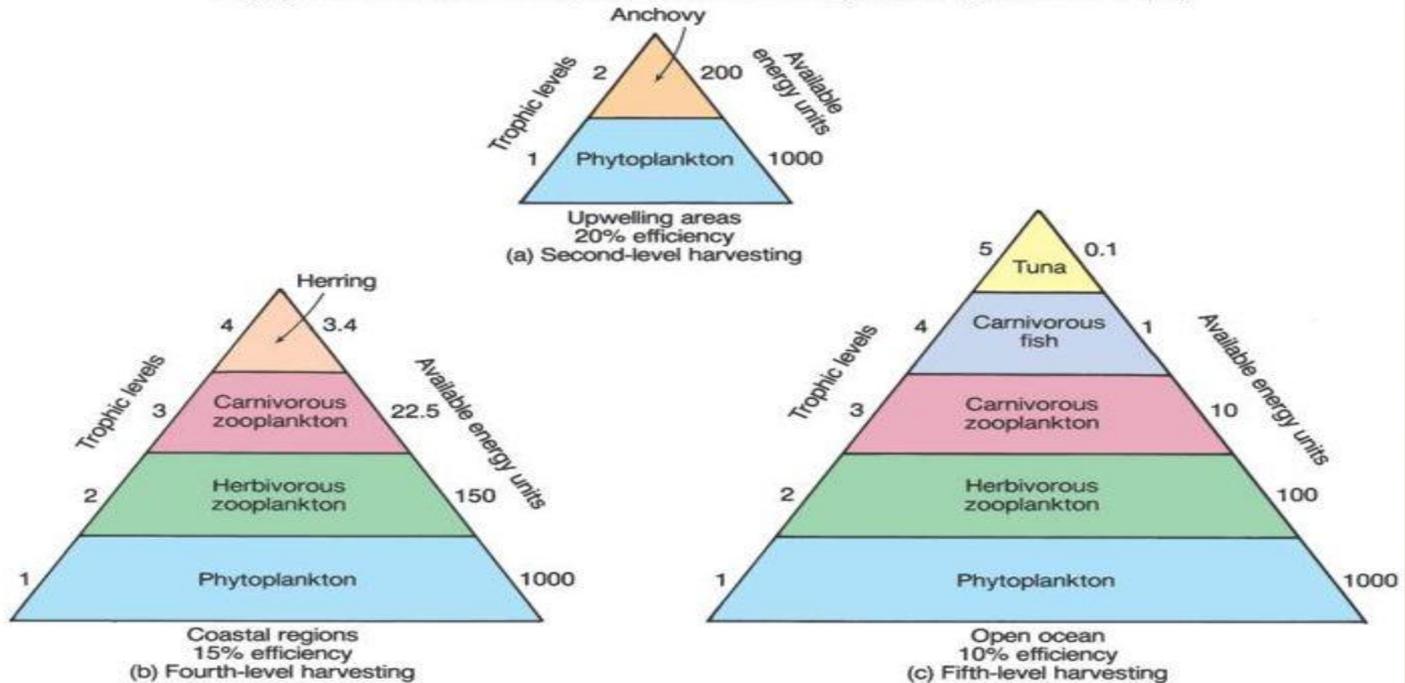


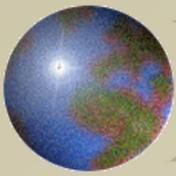


74. Energy is transferred from one organism to another within a food web.

Fig 15.14 in "An Introduction to the World's Oceans" (2nd edition, 2004)

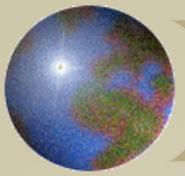
Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



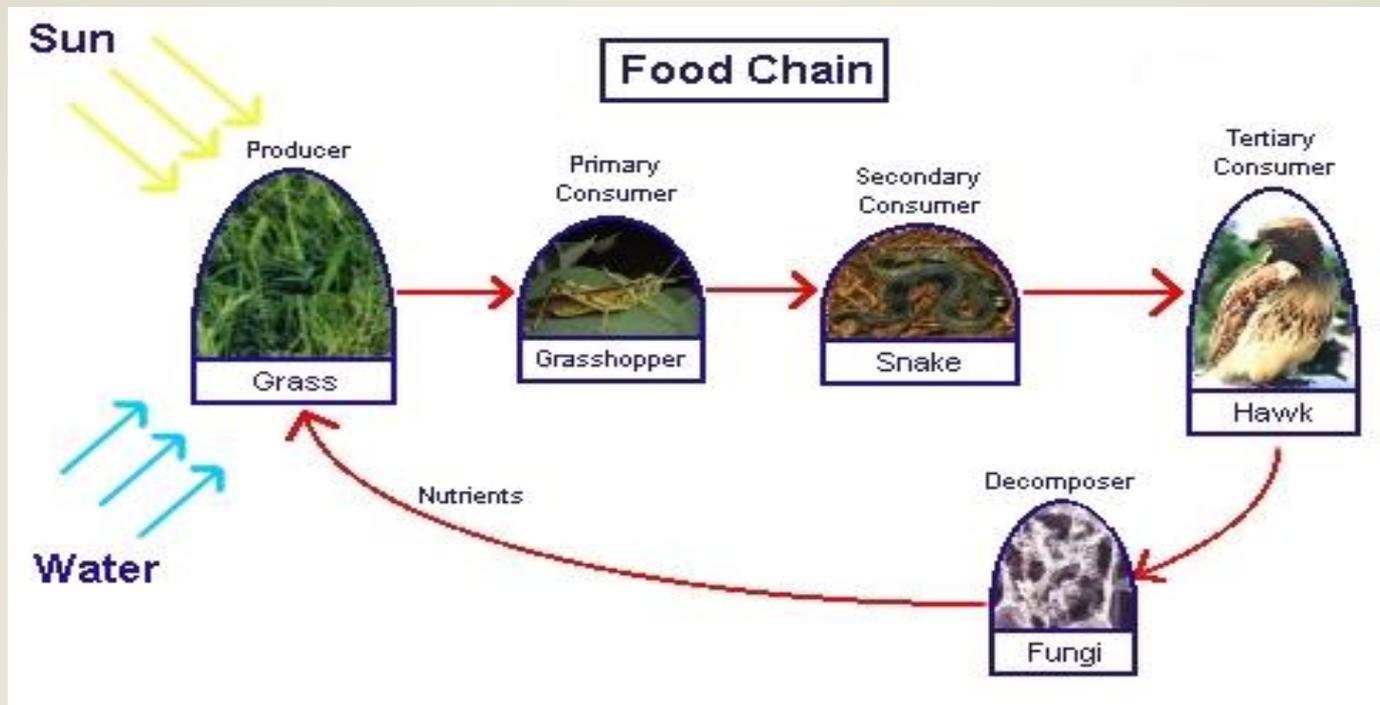


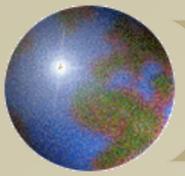
75. Decomposers are responsible for recycling materials when they breakdown organic molecules from dead organisms.





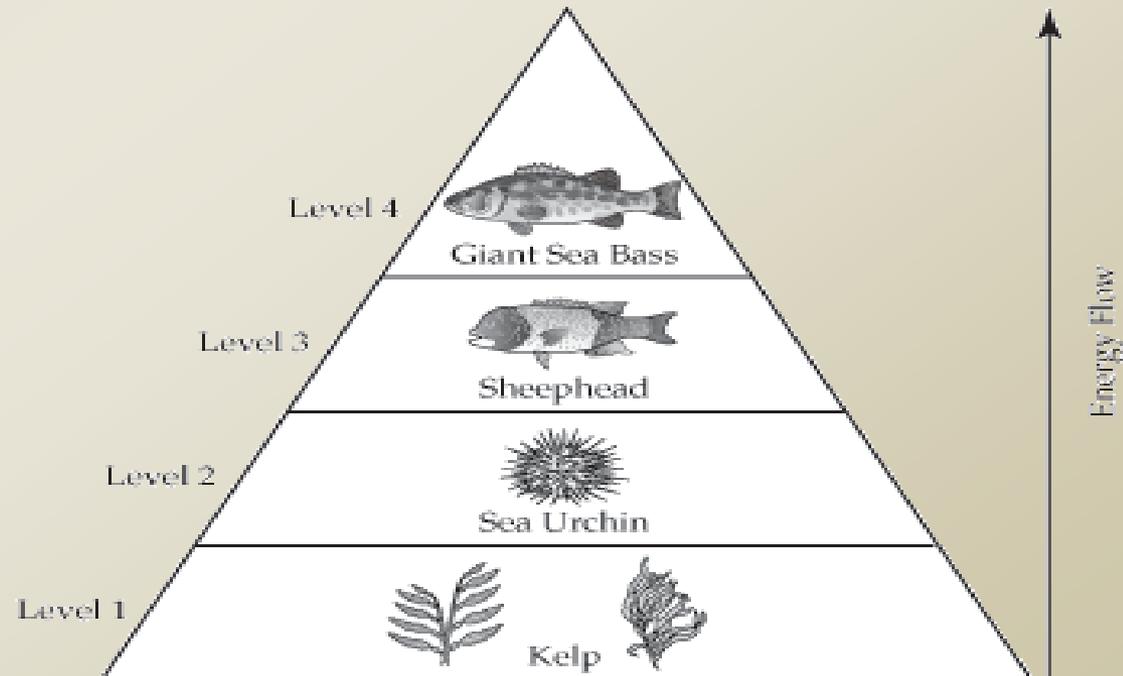
76. Food chains always begin with a producer, progress with a series of consumers, and end with decomposers.

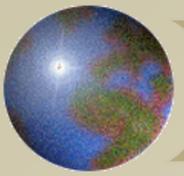




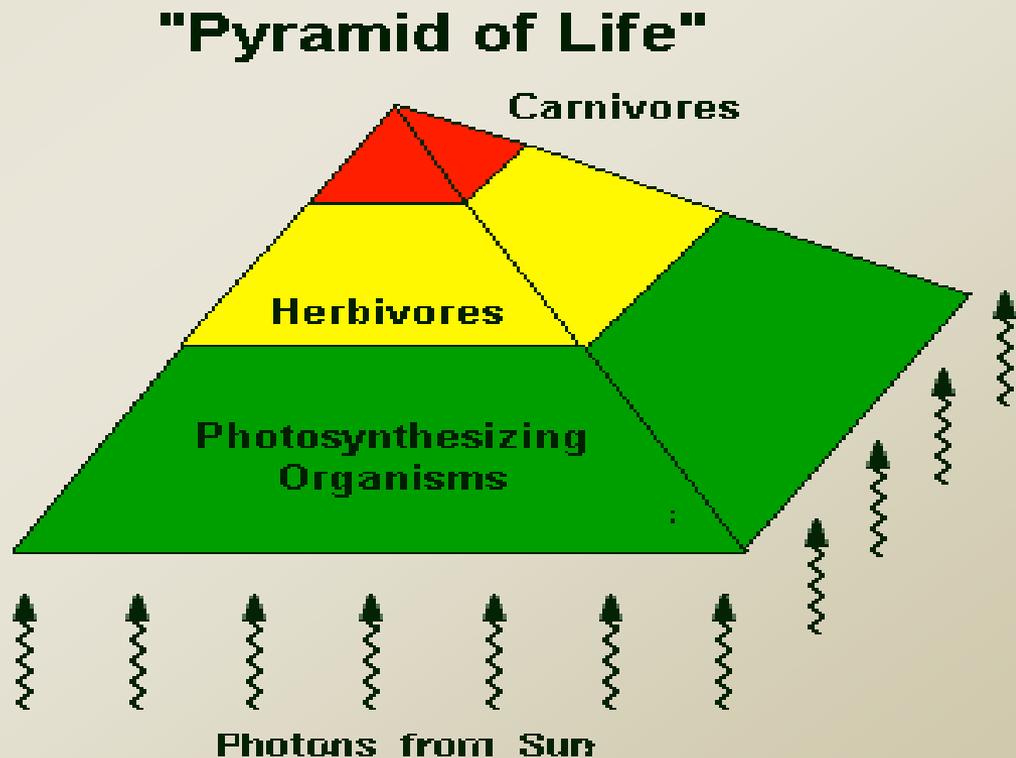
77. *Only 10% of the energy processes from one level of the food chain to the next level because energy is used in metabolism.*

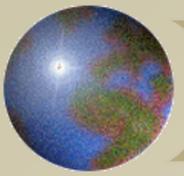
FLOW OF ENERGY IN A KELP FOREST ECOSYSTEM



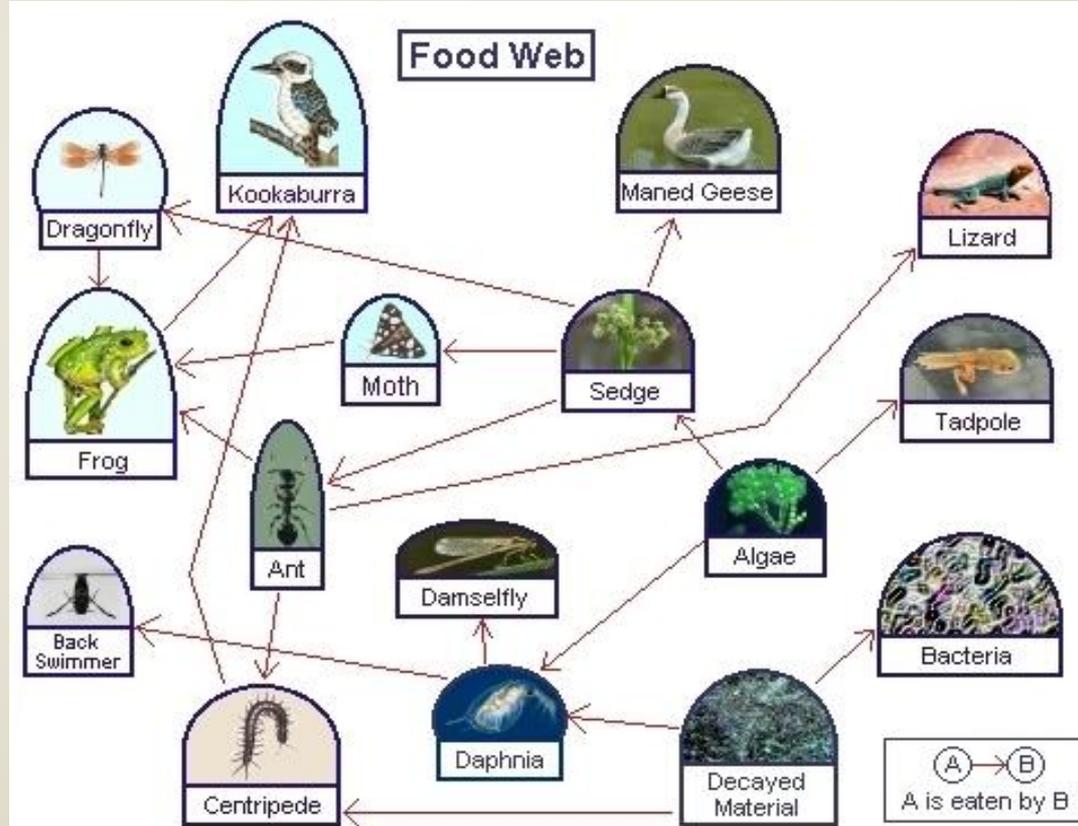


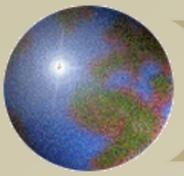
78. *Plants hold most of the energy in the ecosystem and are at the base of an ecosystem's energy pyramid.*





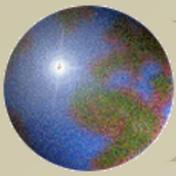
79. *If the population of one organism in a food web increases or decreases, it will affect all the other organisms in the food web with which it is linked.*



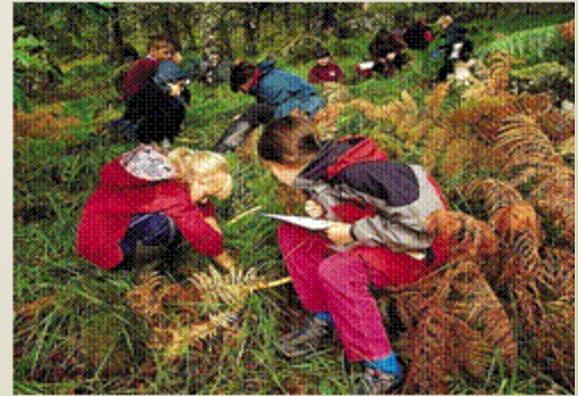
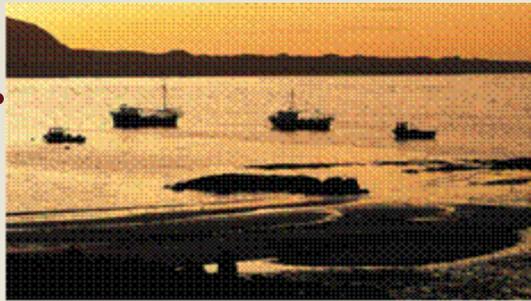


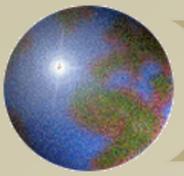
80. In a host-parasite symbiotic relationship, one organism is harmed while the other benefits.



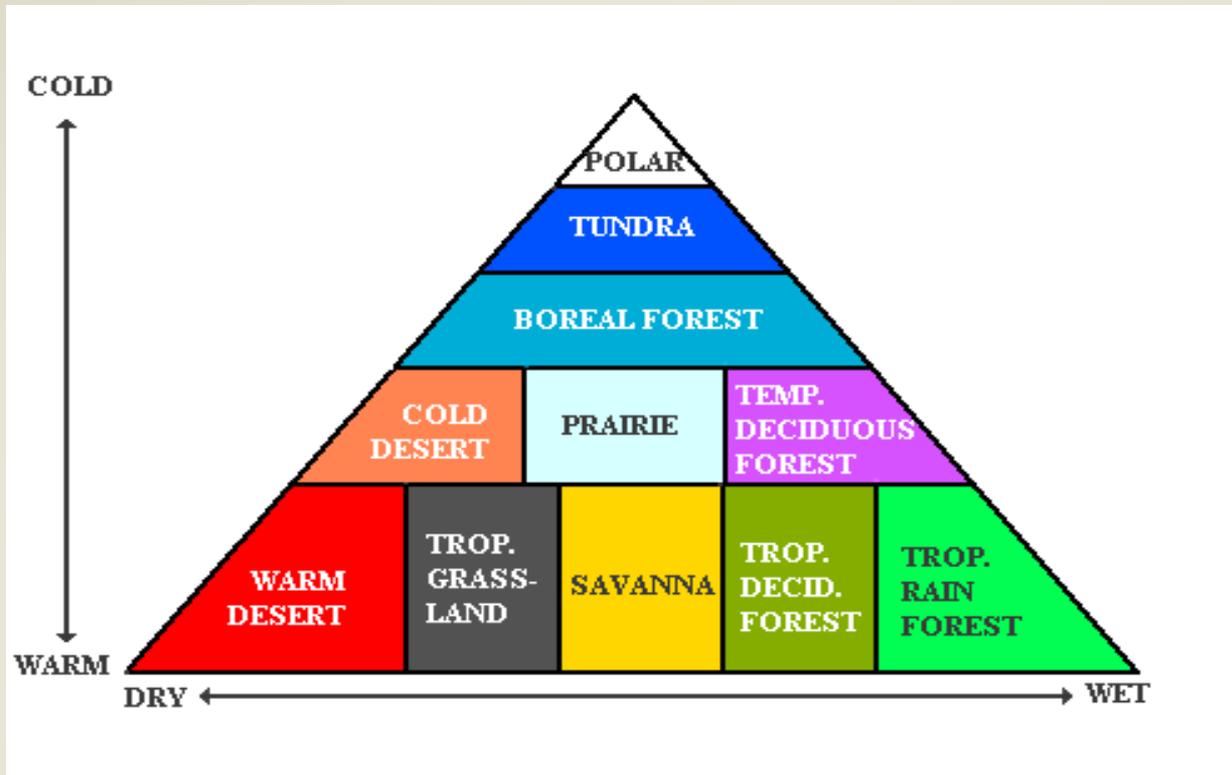


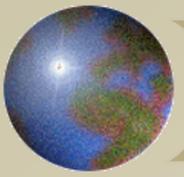
81. Stable ecosystems have a complex food web and high biodiversity.



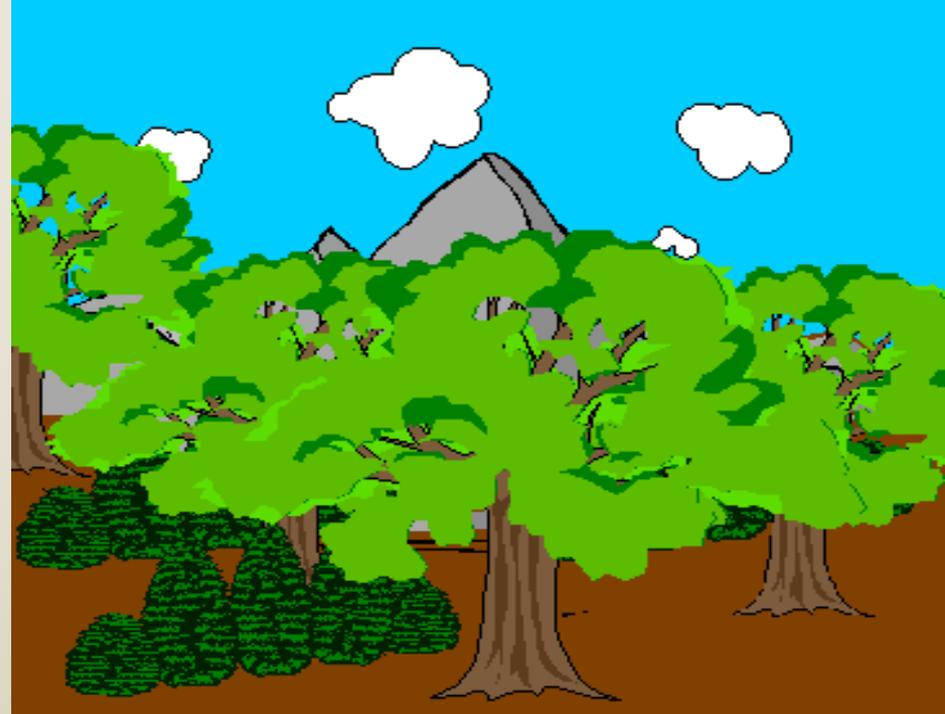
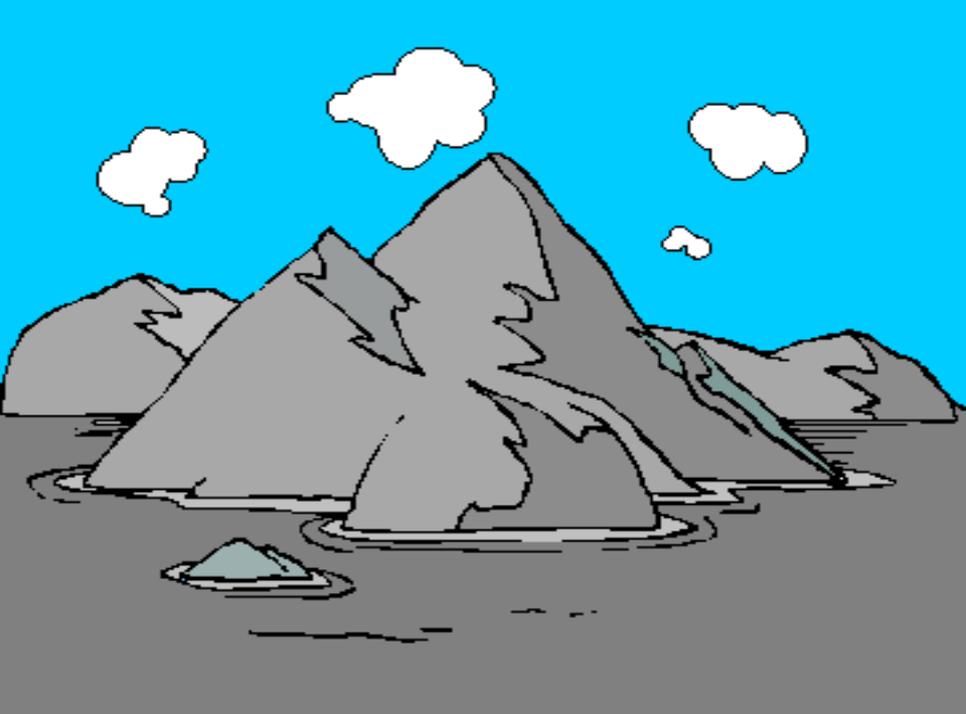


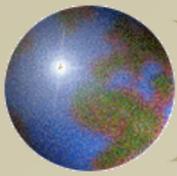
82. *Biomes are the regions of the Earth with similar climatic conditions, plants, and animals.*





83. Climax communities develop in ecosystems over thousands of years through the process of ecological succession.

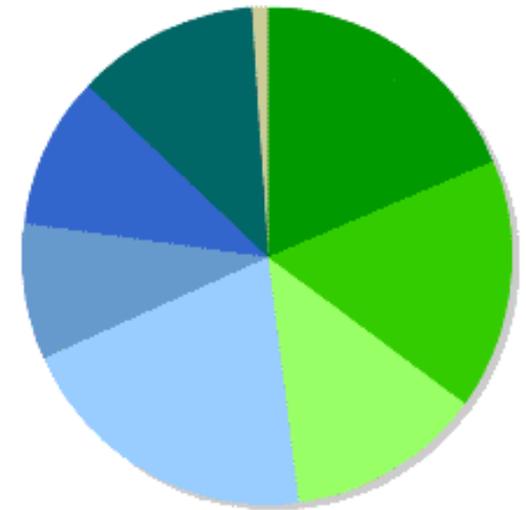




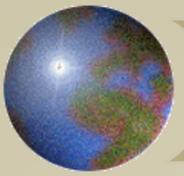
84. Water ecosystems: ponds and lakes into marshes, into swamps, into dry land.



Figure 1: The relative value of ecosystems

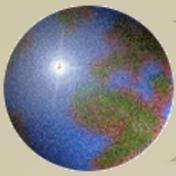


- | | |
|--|---|
|  Forests |  Estuaries |
|  Agriculture & horticulture |  Near coastal zone |
|  Wetlands |  Coastal marine area |
|  Rivers and lakes |  Other |

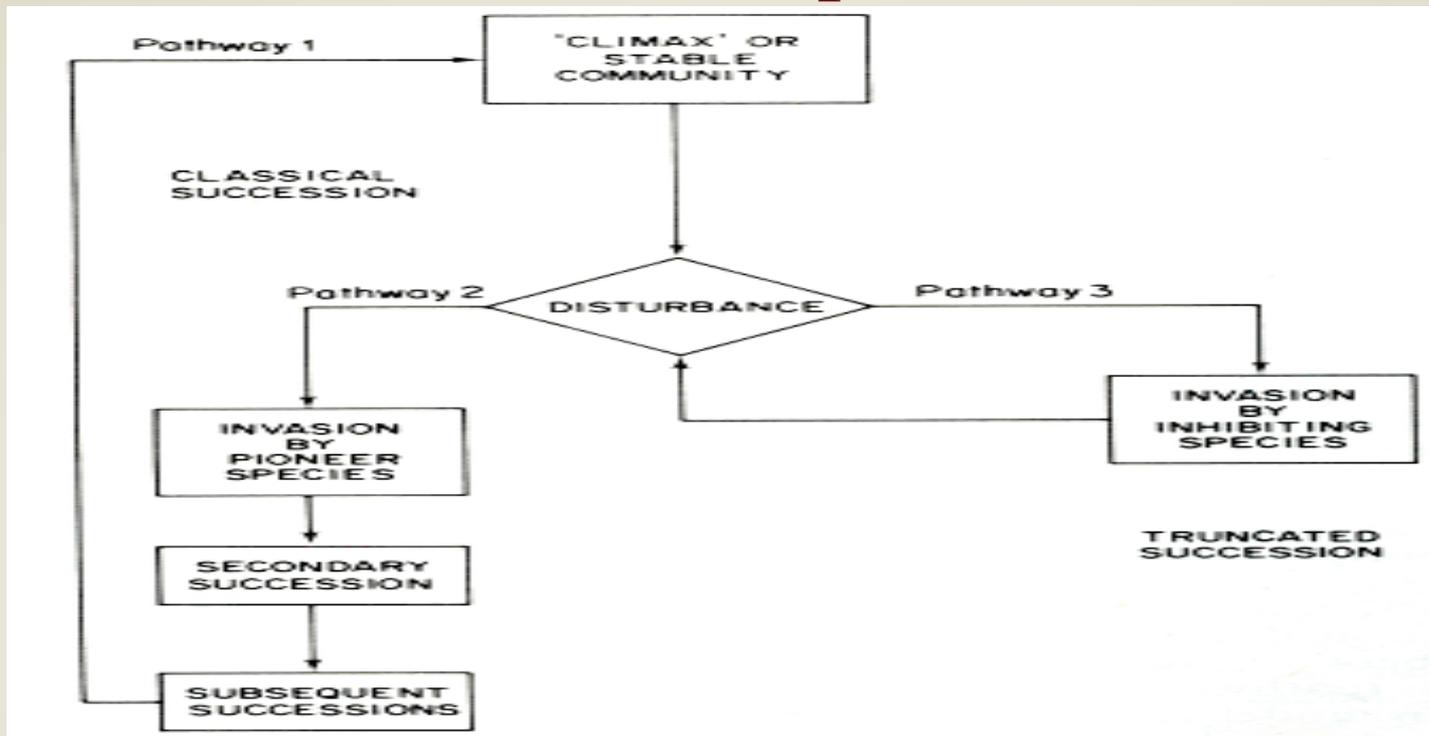


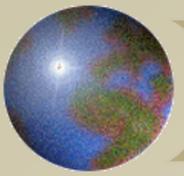
85. *Land ecosystems: rock into soil by lichens acid secretions, into mosses, into grasses, into shrubs, into conifers and then into deciduous forests (leafy trees), called a climax community; the most mature kind of community.*



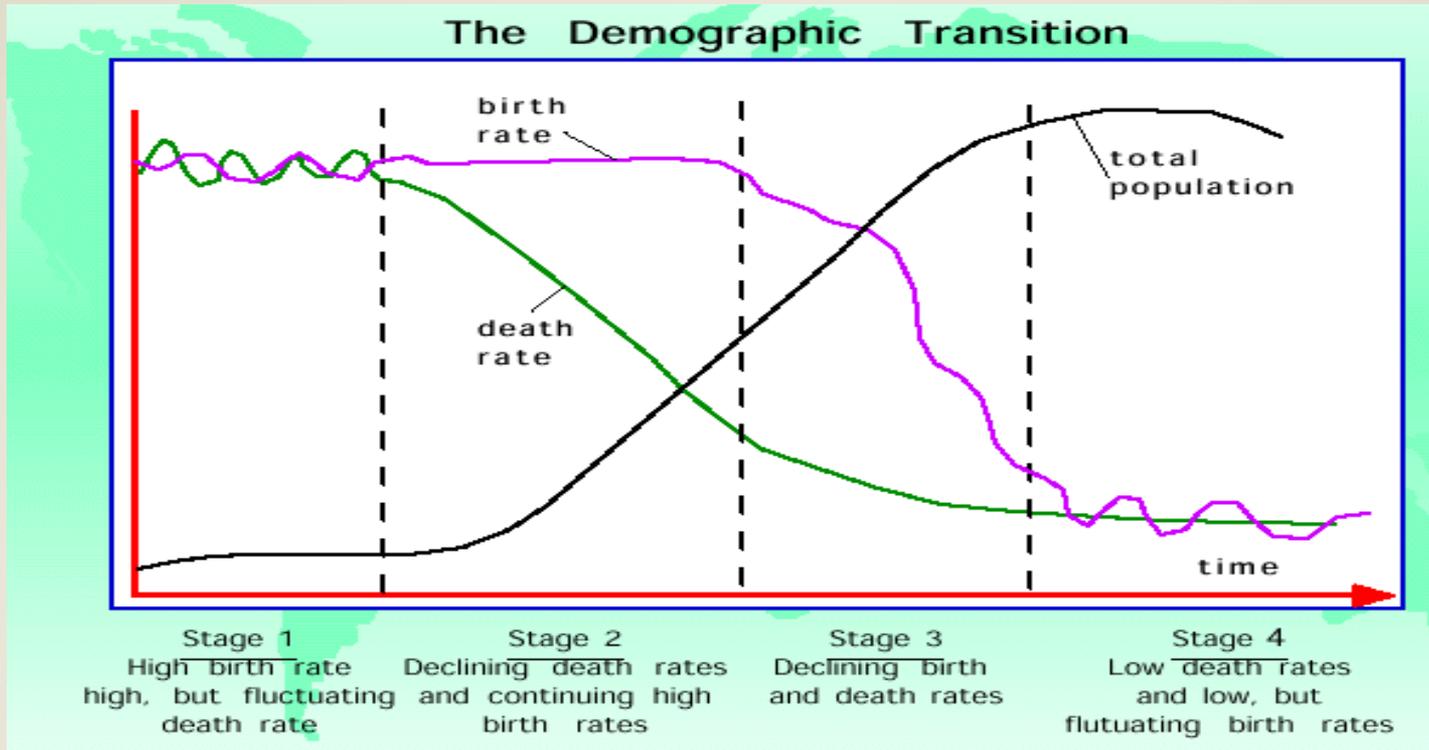


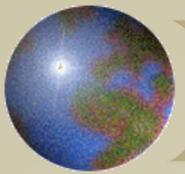
86. *Ecosystems containing climax communities will remain stable unless they are disrupted by a natural disaster or pollution.*





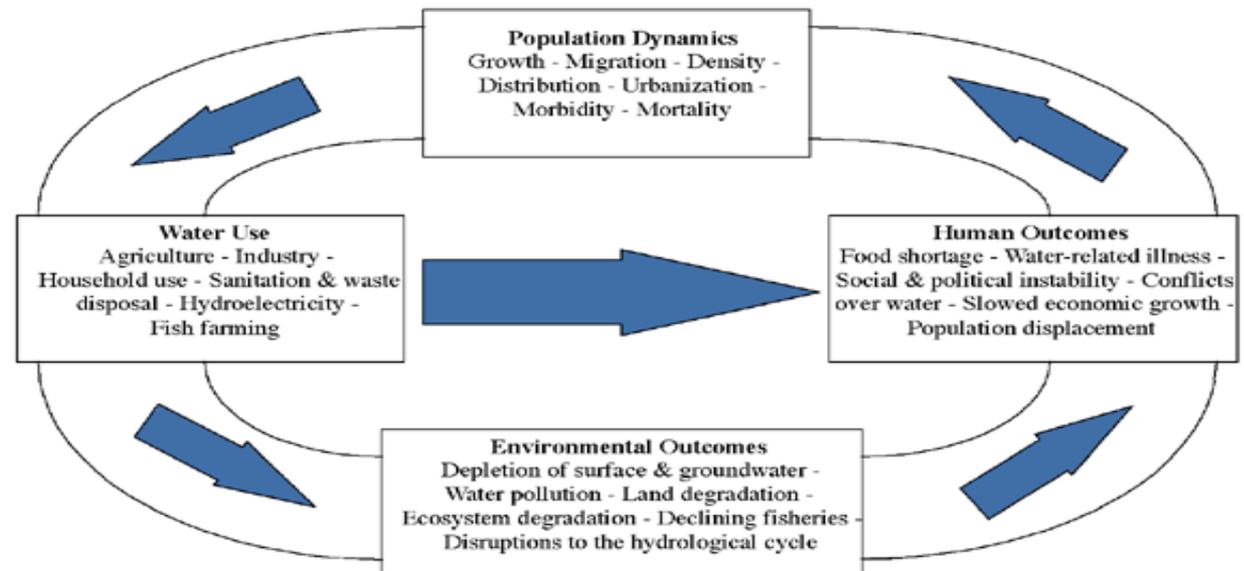
87. *The human population on Earth has exponentially increased in the past 60 years due to a decrease in disease.*



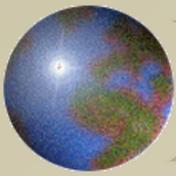


88. *An increase in human population has caused a depletion of the world's finite resources and an increase in environmental damage.*

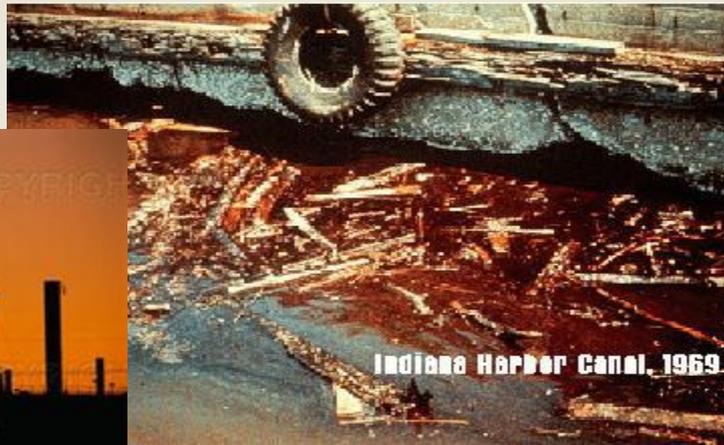
Figure 1. Links Between Population and Freshwater

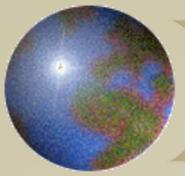


Source: IUCN et al. 1996 (199)

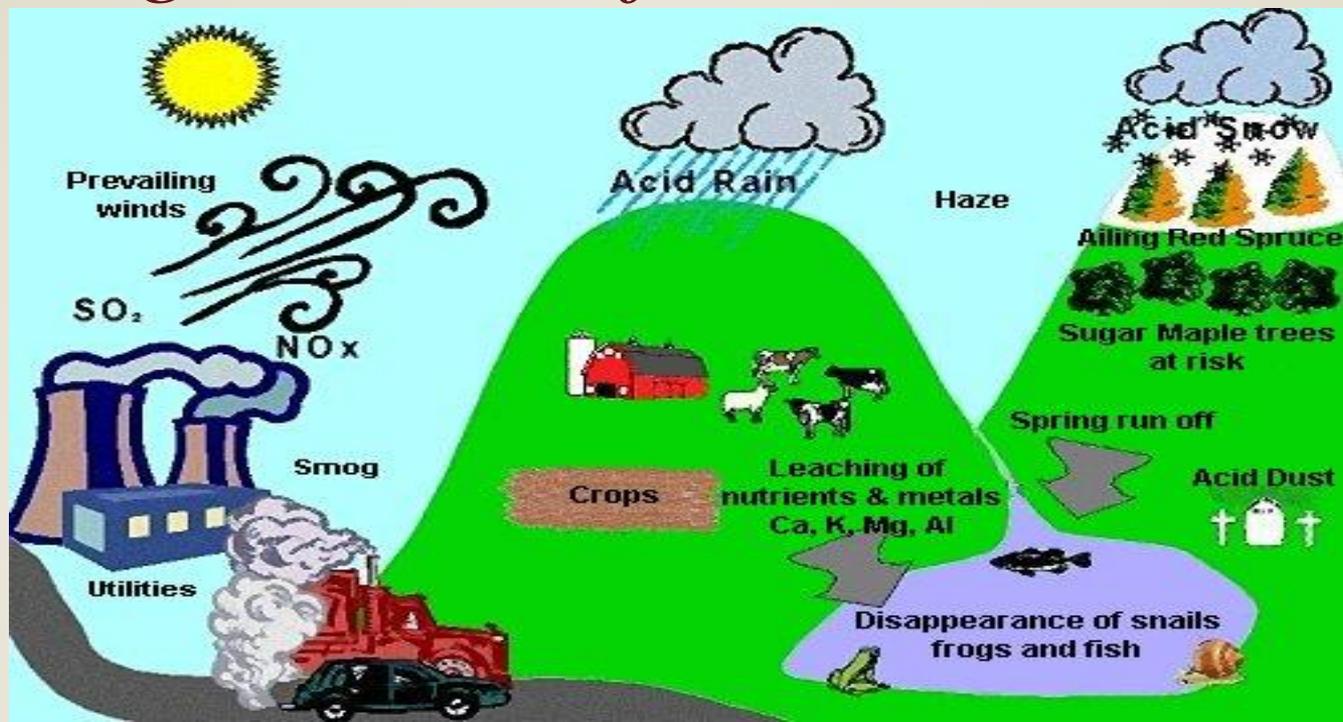


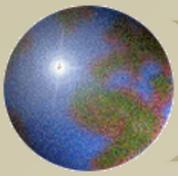
89. Pollution by humans has disrupted the balance in many ecosystems and subsequently has endangered many species.



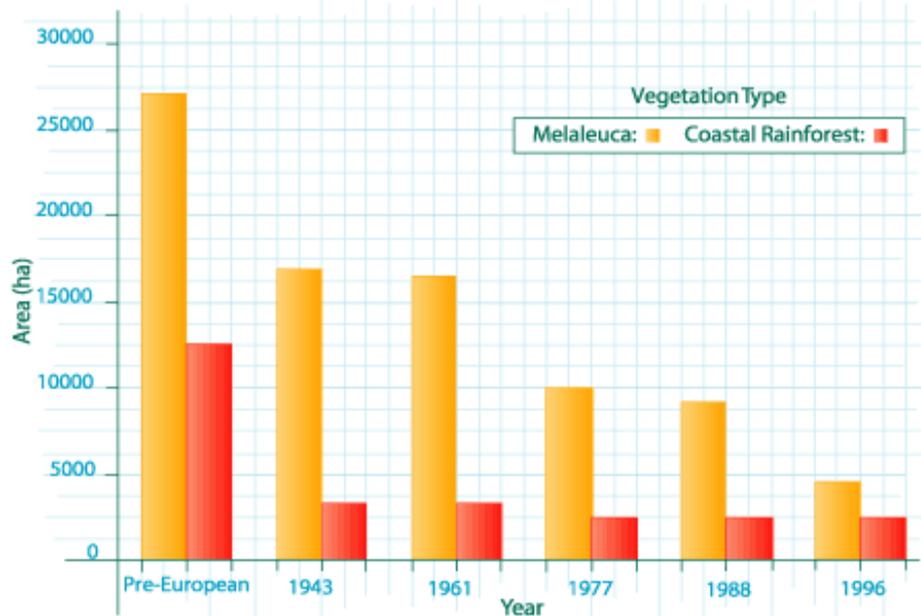


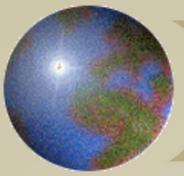
90. *Acid rain is a major environmental problem caused by factory emissions containing nitrogen and sulfur.*



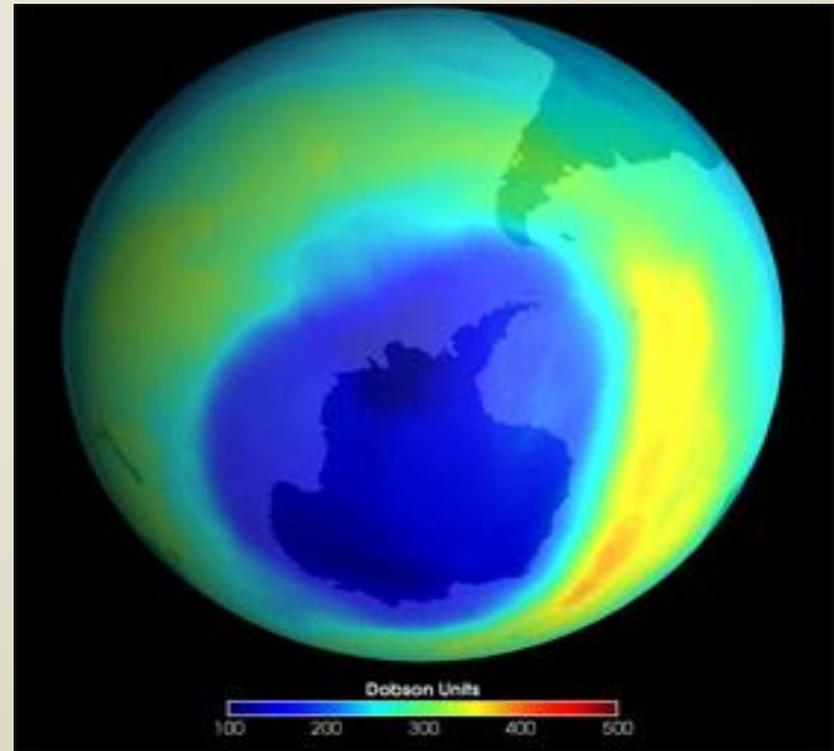
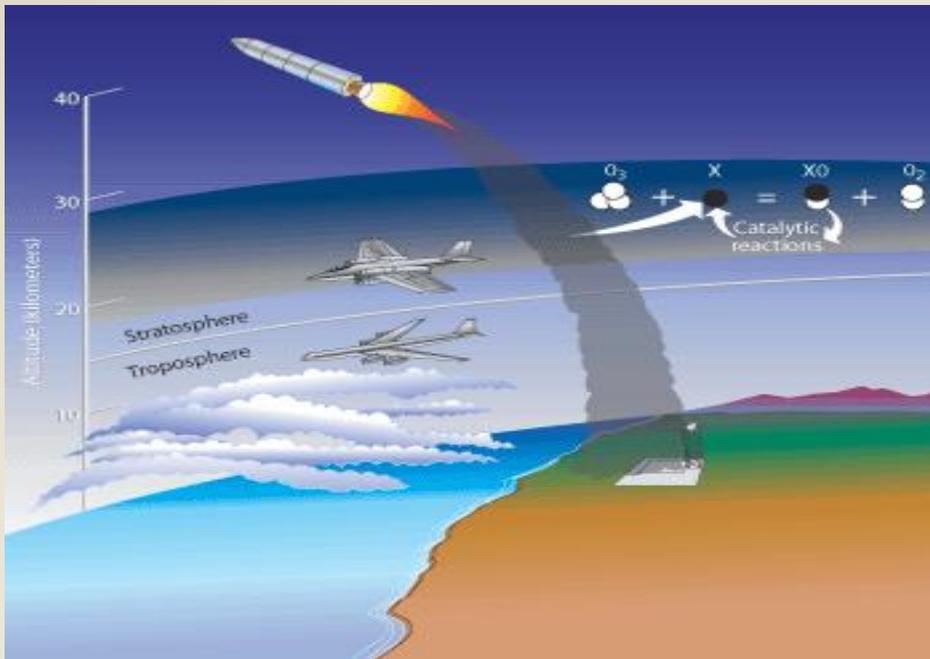


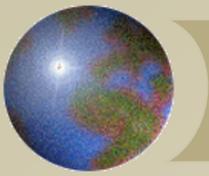
91. Chemical pesticides and wastes that enter into the environment affect wildlife and may cause a decrease in biodiversity.



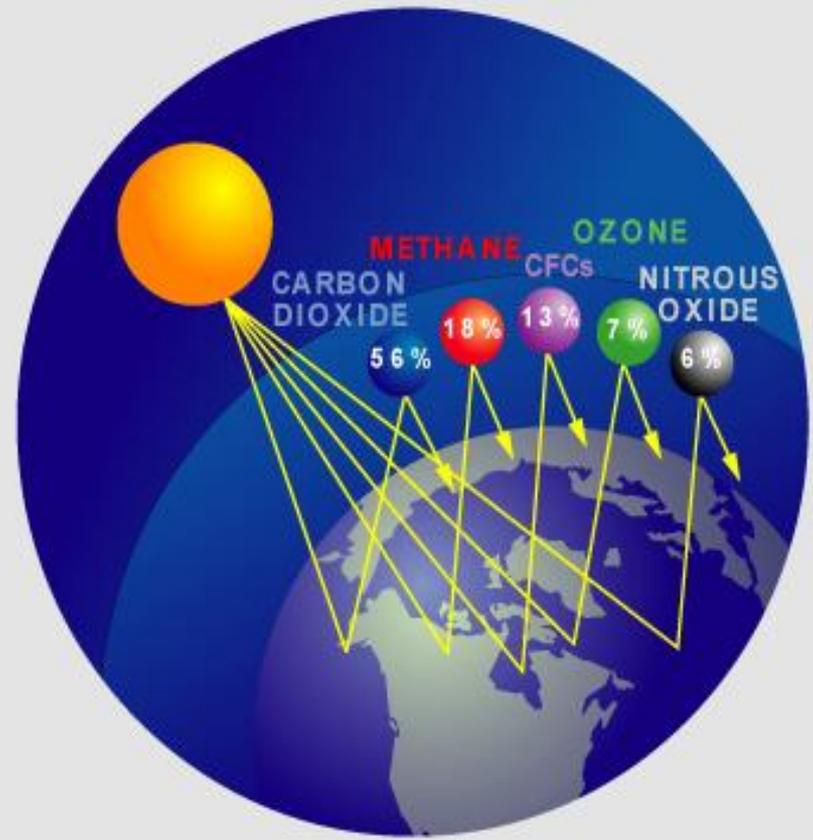
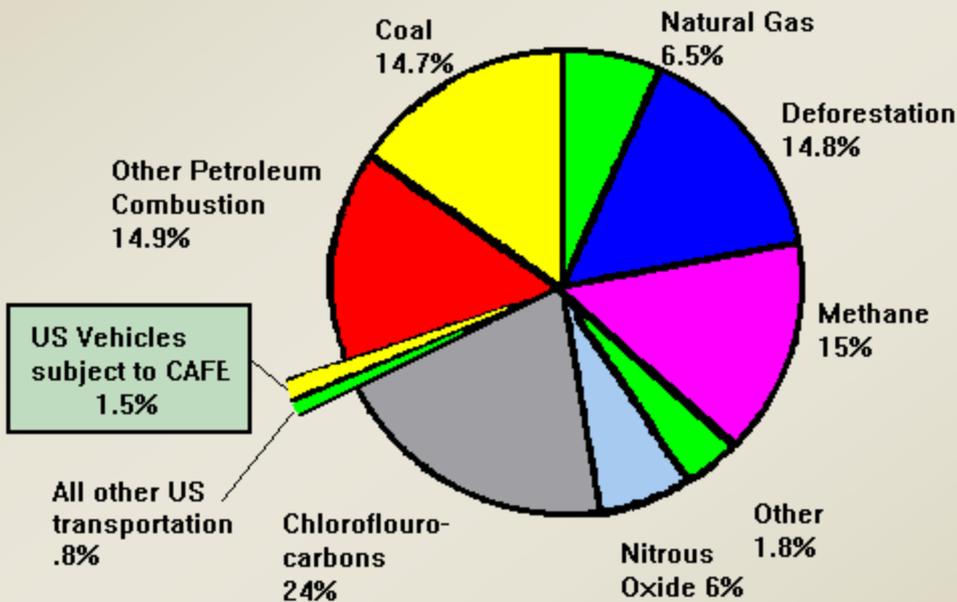


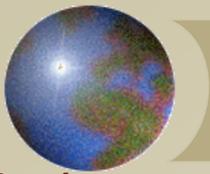
92. Destruction of the ozone layer by pollution results in more ultraviolet rays reaching the surface.





93. *Increased levels of greenhouse gases (CO_2 and methane CH_4) in the troposphere have led to global warming.*

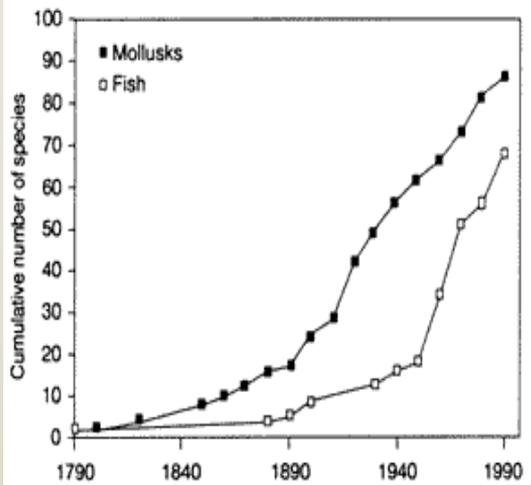
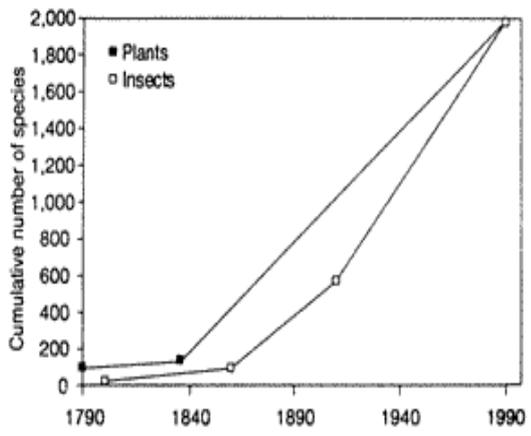
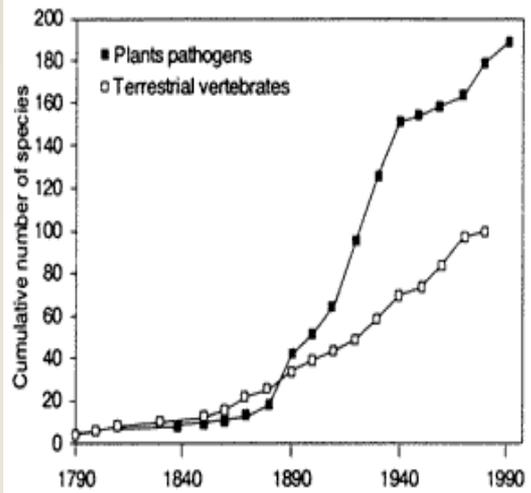




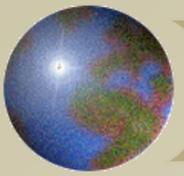
94. Importing species from other

ecosystems into an area may cause an imbalance in the food web and environmental destruction.

Harmful Nonindigenous Species

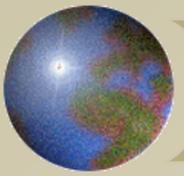


SOURCES: Summarized by the Office of Technology Assessment from: J.C. Britton, "Pathways and Consequences of the Introduction of Non-Indigenous Freshwater, Terrestrial, and Estuarine Mollusks in the United States," contractor report prepared for the Office of Technology Assessment, October 1991; W.R. Courtenay, Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, September 1991; K.C. Kim and A.G. Wheeler, "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United States," contractor report prepared for the Office of Technology Assessment, December 1991; R.N. Mack, "Pathways and Consequences of the Introduction of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991; Sailer, R.L., "History of Insect Introductions," *Exotic Plant Pests and North American Agriculture*, C.L. Wilson and C.L. Graham (eds.) (New York, NY: Academic Press, 1983), pp. 15-38; C.L. Schoutites, "Pathways and Consequences of the Introduction of Non-Indigenous Plant Pathogens in the United States," contractor report prepared for the Office of Technology Assessment, December 1991; S.A. Temple and D.M. Carroll, "Pathways and Consequences of the Introduction of Non-Indigenous Vertebrates in the United States," contractor report prepared for the Office of Technology Assessment, October 1991.

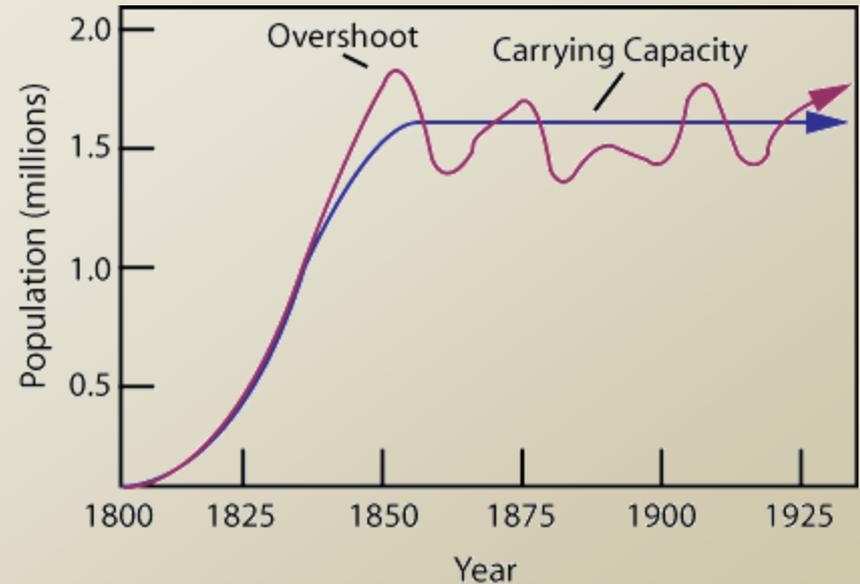


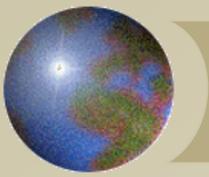
95. When a population's size is too large, competition for resources in creases between members of the species.



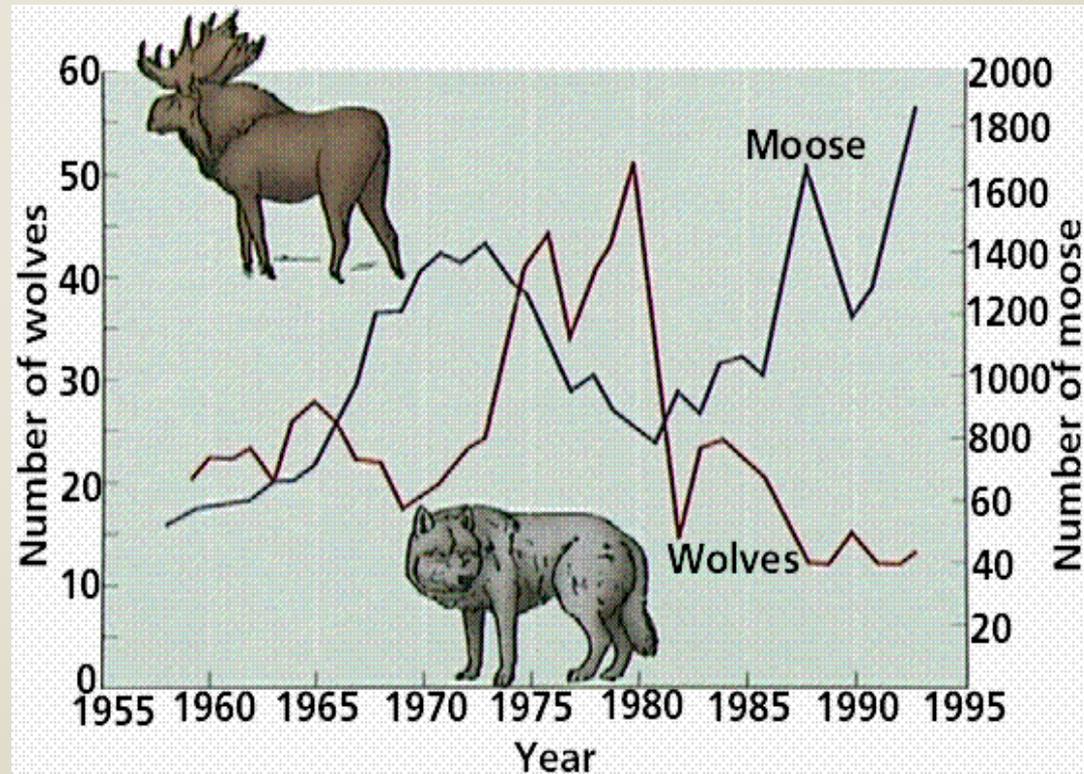
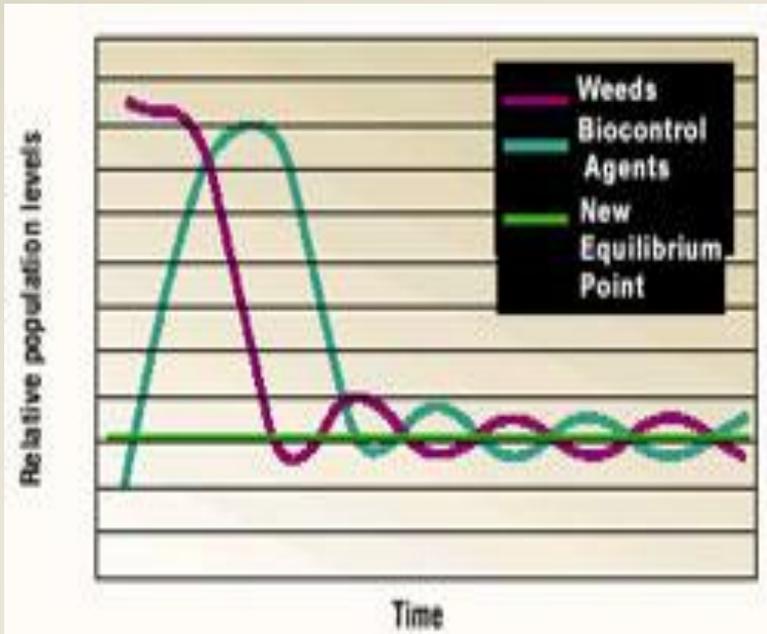


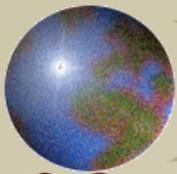
96. The carrying capacity is the maximum number of individuals that can survive on the resources that are present in an area.





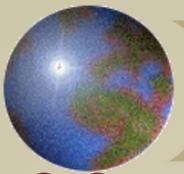
97. Biological controls are better than chemicals controls for regulating the size of populations.





98. *Chemical pesticides permanently damage the environment, but only provide a short-term solution to insect population problems.*





99. The problem is what is being investigated and is written in question form.

The Basic Steps:

State the Problem

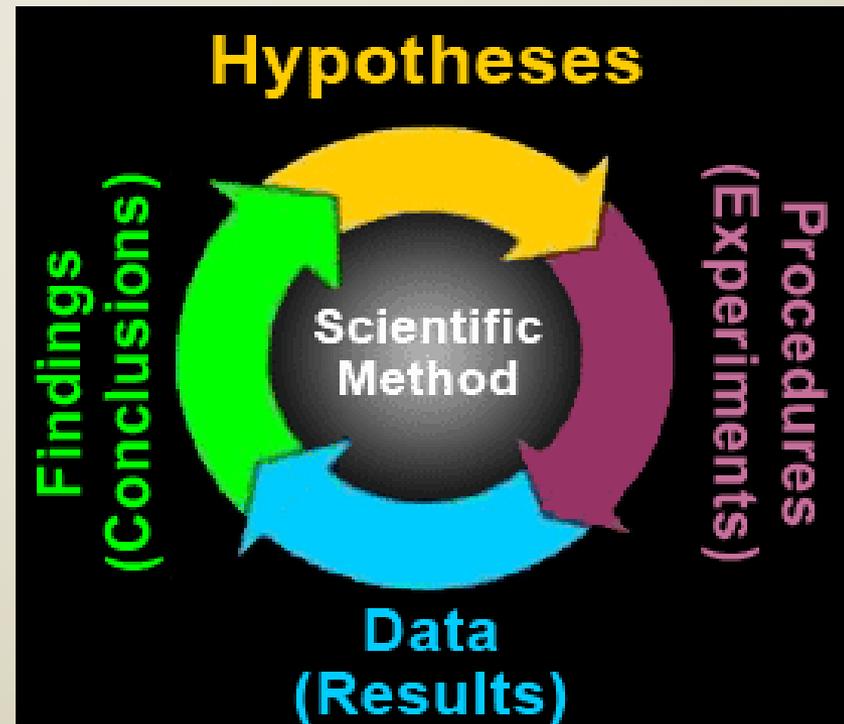
Form a Hypothesis

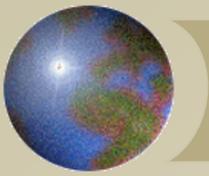
Test the Hypothesis

Collect the Data

Analyze the Data

Draw Conclusions





100. The hypothesis is a testable possible solution about the answer to the problem and is a statement written in a sentence.

The Basic Steps:

State the Problem

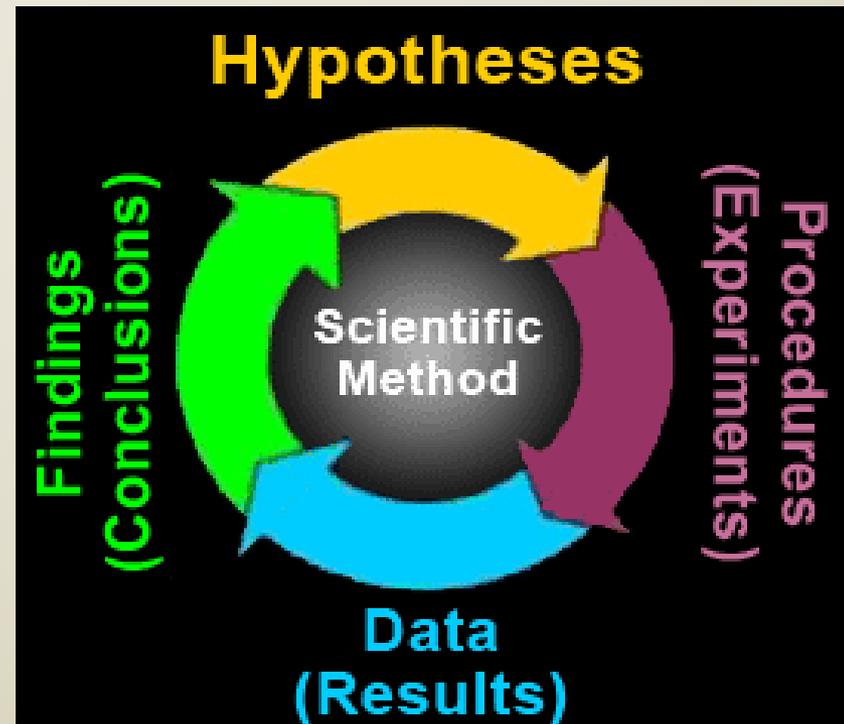
Form a Hypothesis

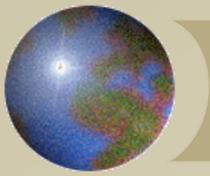
Test the Hypothesis

Collect the Data

Analyze the Data

Draw Conclusions

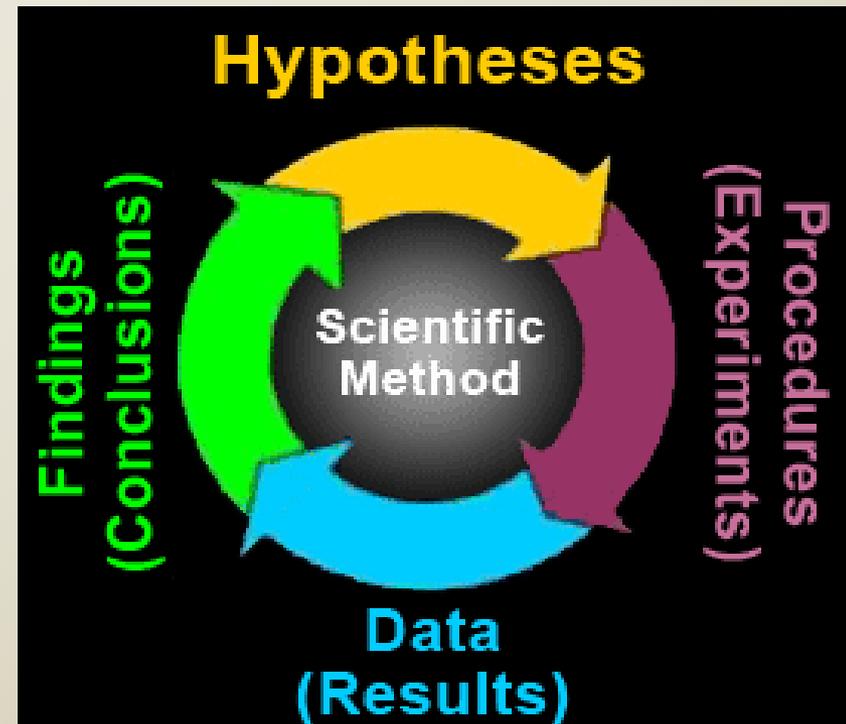


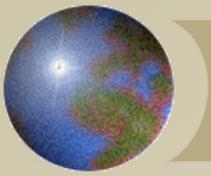


101. A conclusion is determined from data in an experiment and is stated as a complete sentence.

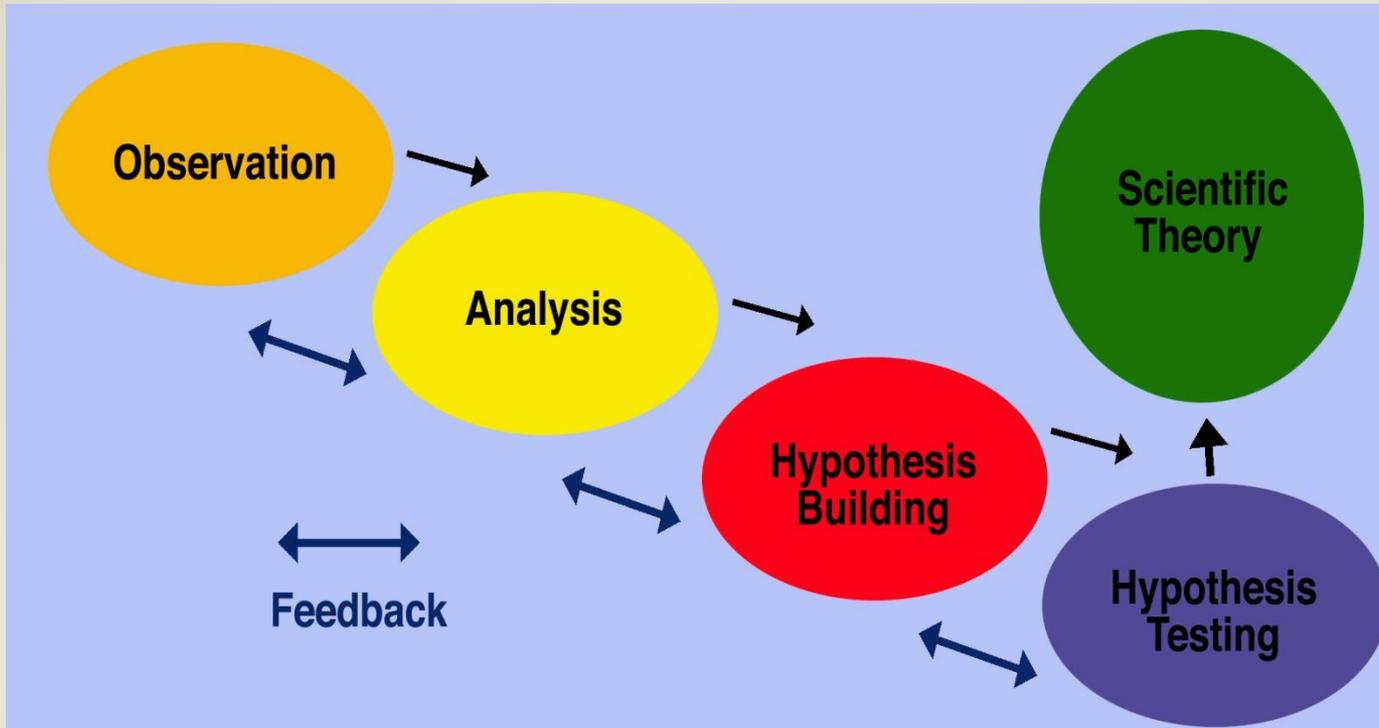
The Basic Steps:

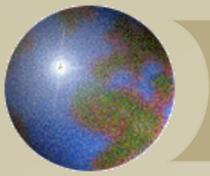
State the Problem
Form a Hypothesis
Test the Hypothesis
Collect the Data
Analyze the Data
Draw Conclusions



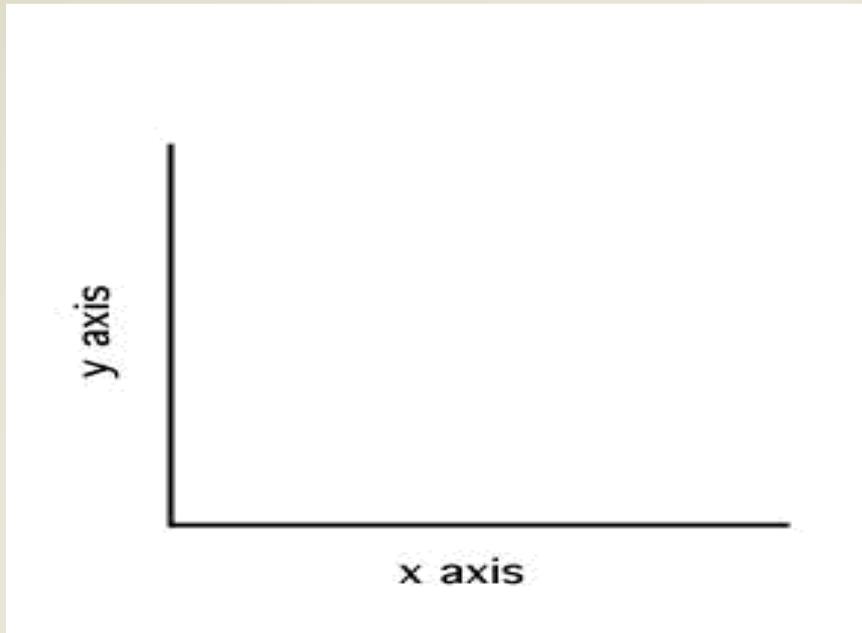


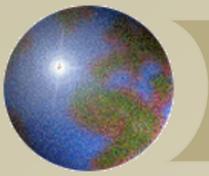
103. An experiment must be completed several times before results are considered valid.



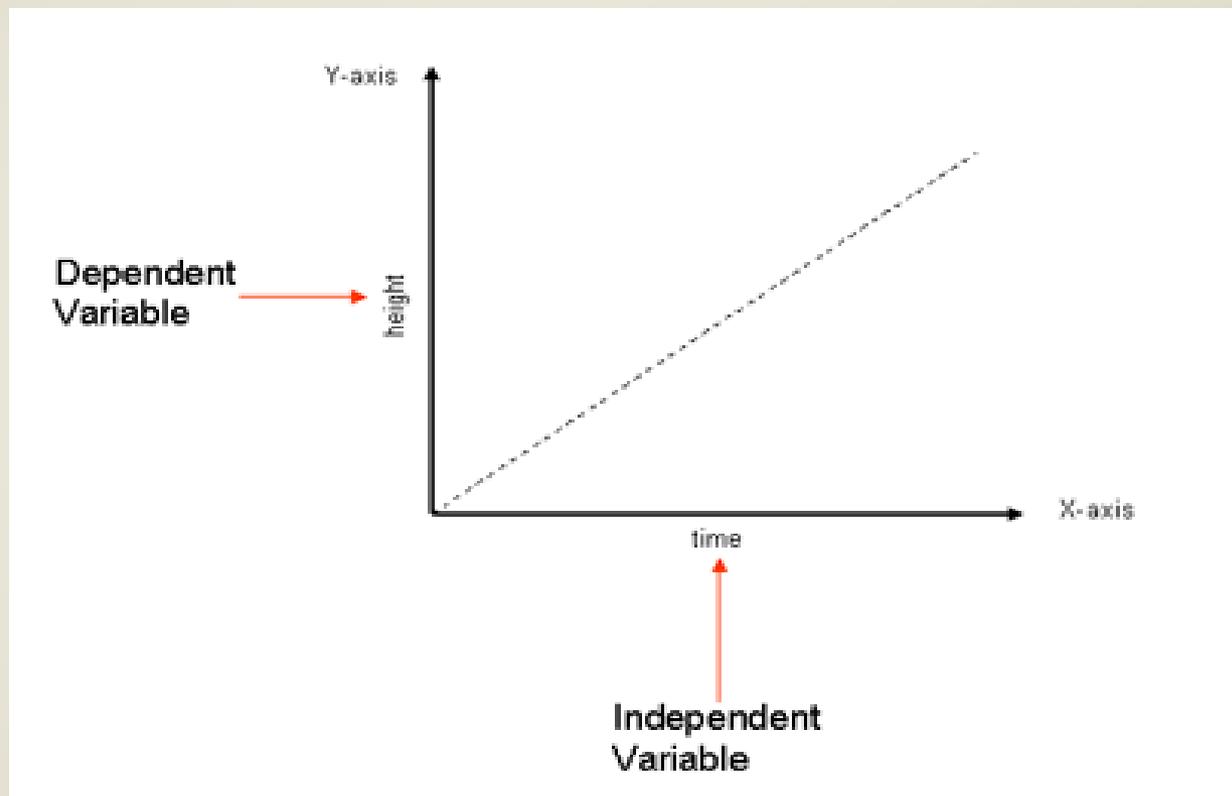


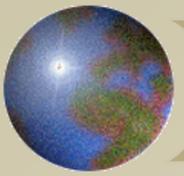
104. The independent variable is the numerical data known before the experiment begins, e.g. time, temperature, day.





105. The dependent variable is the numerical data obtained during the experiment; the measured variable.

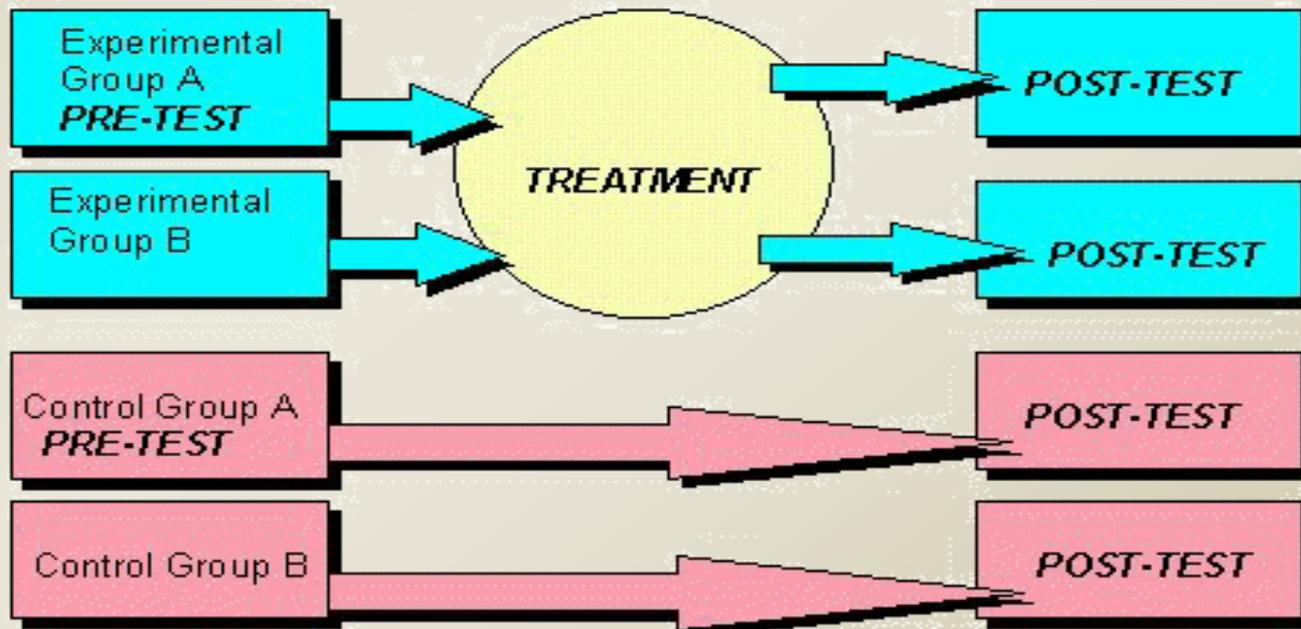


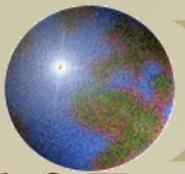


106. Every experiment must have a control.



EXPERIMENTAL RESEARCH DESIGNS SOLOMON FOUR GROUP DESIGN

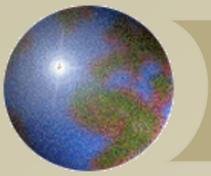




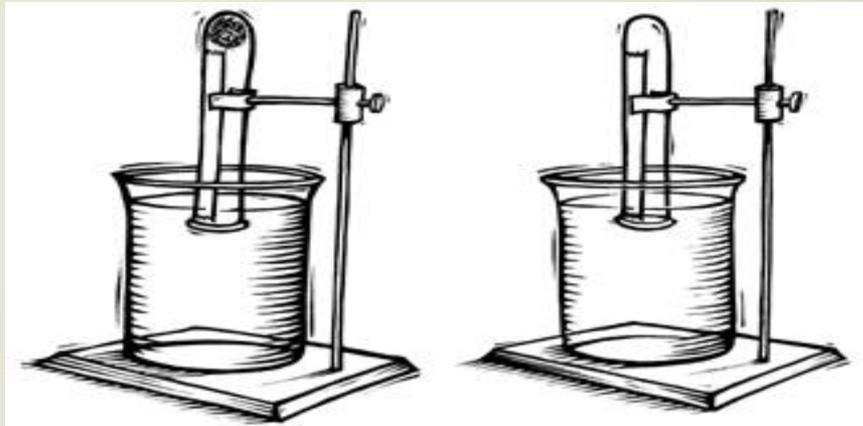
107. *Conditions in an experiment*

must be exactly the same for all test tubes or test subjects. Only the single variable condition being investigated should differ.





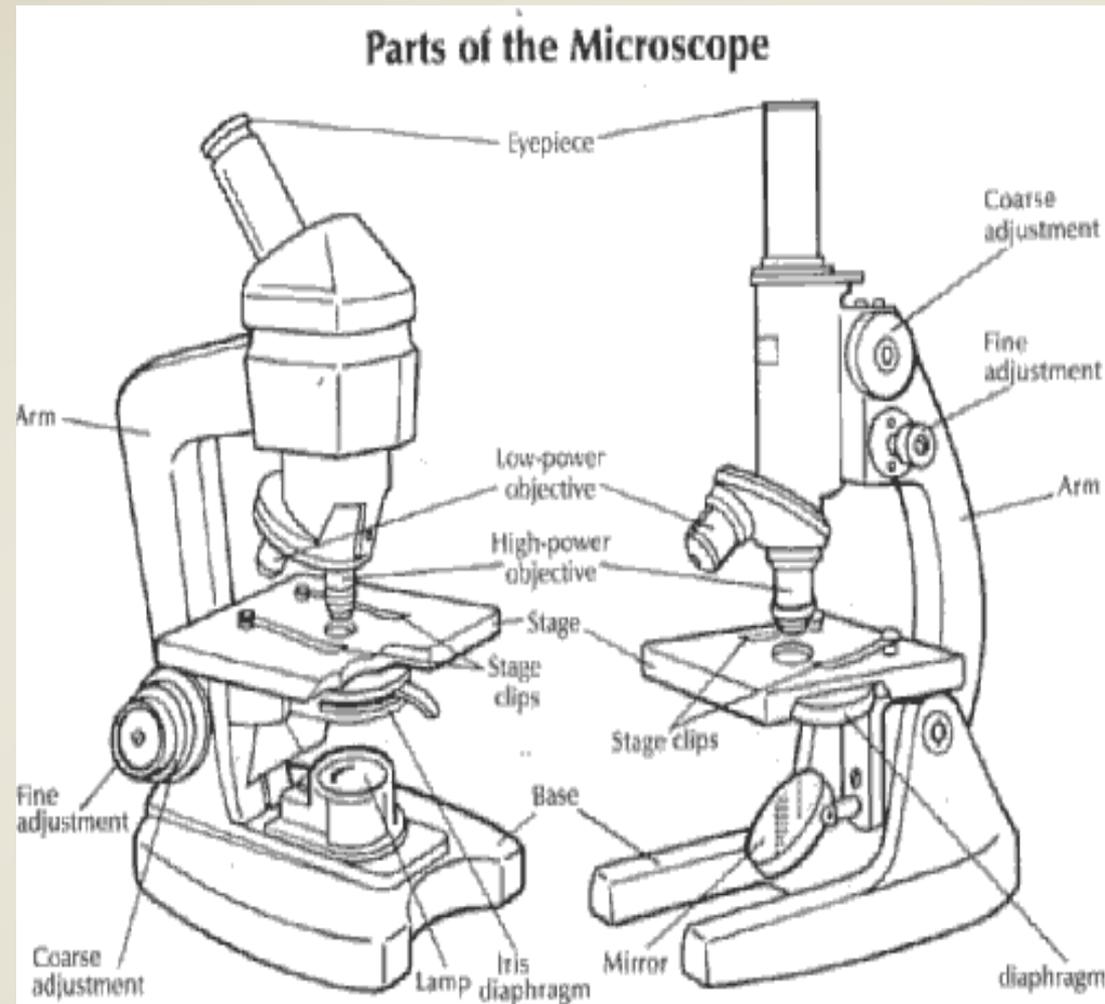
108. Always use multiple set-ups for each condition and average the results to obtain valid data. Each setup must contain an organism of the same species and exactly the same conditions.

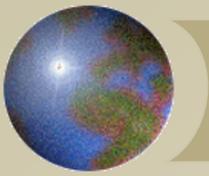




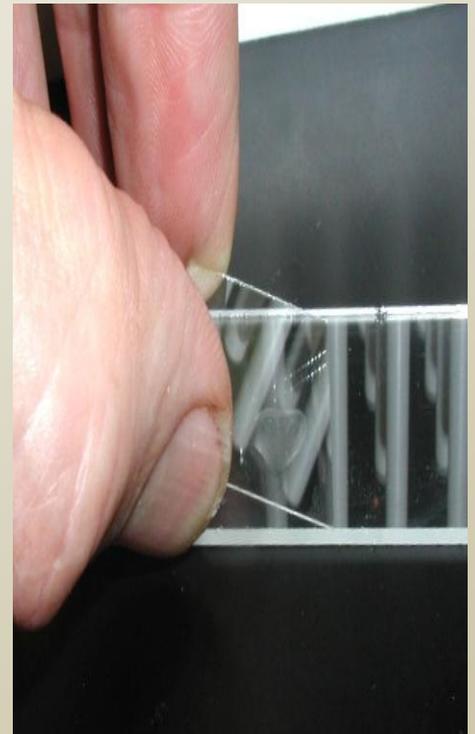
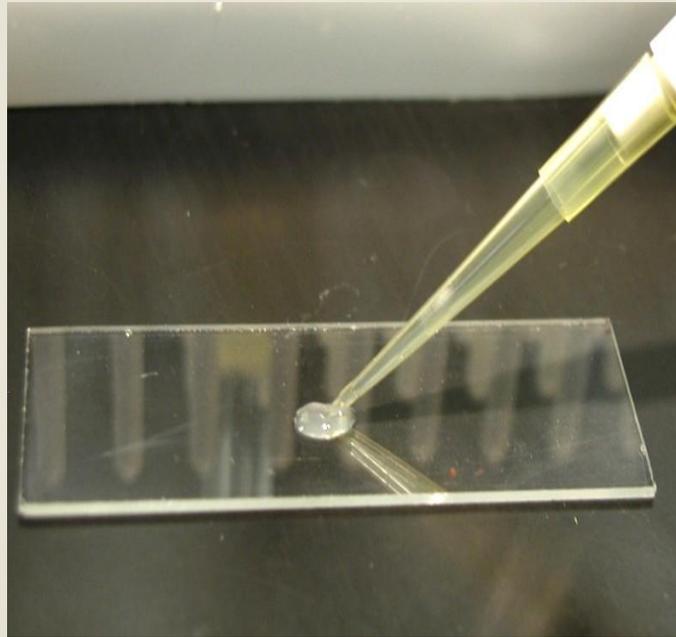
109. Open the diaphragm of the microscope to adjust the brightness and only use the fine

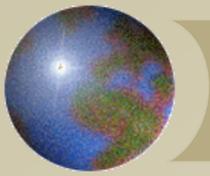
adjusting knob when focusing using high power magnification.



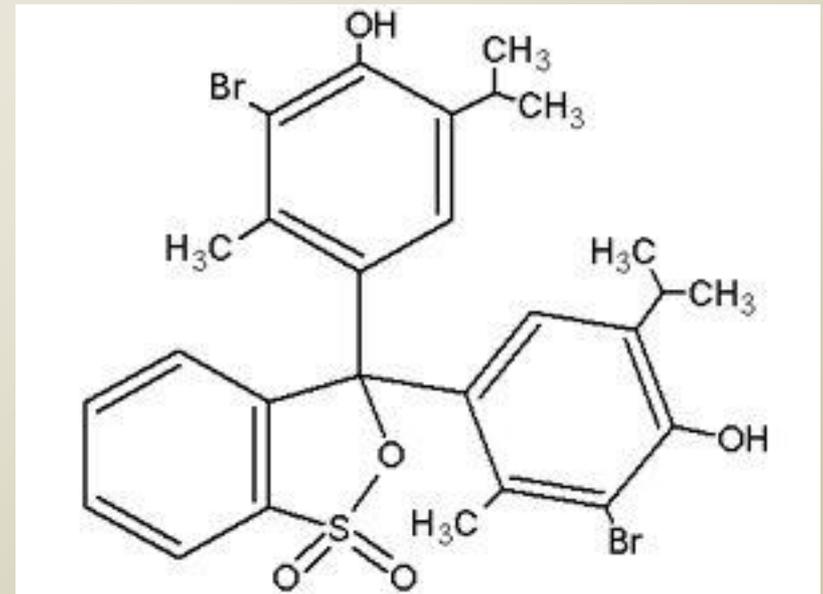
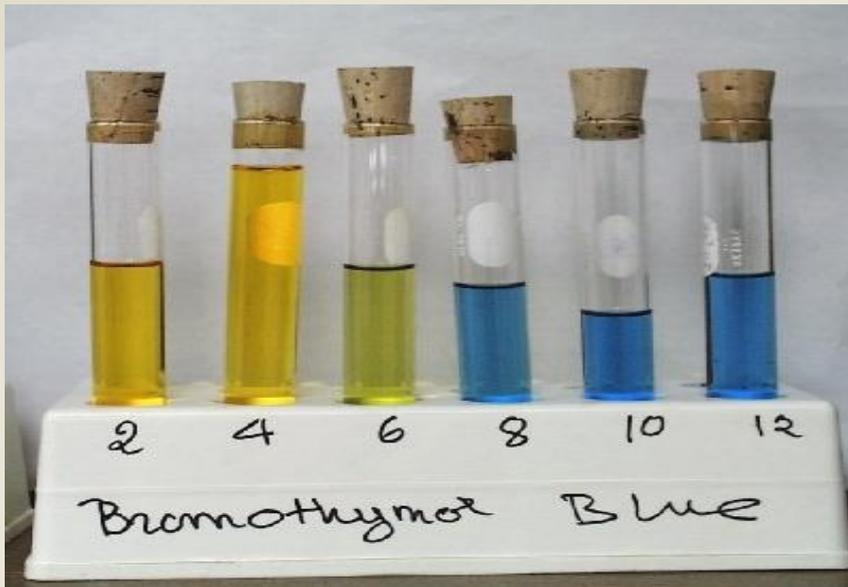


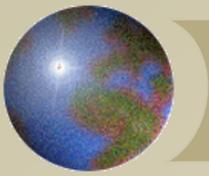
110. Wet mount slides must be prepared to view live specimens under a microscope.





111. Bromothymol blue is an indicator for carbon dioxide and used in photosynthesis and respiration experiments.



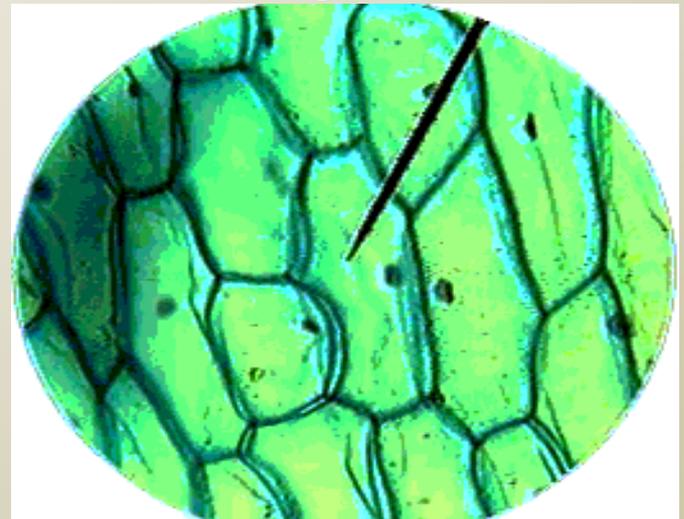


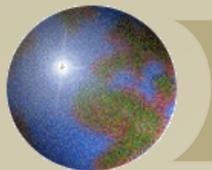
112. Iodine (Lugol's solution) is an indicator for starch (polysaccharide).



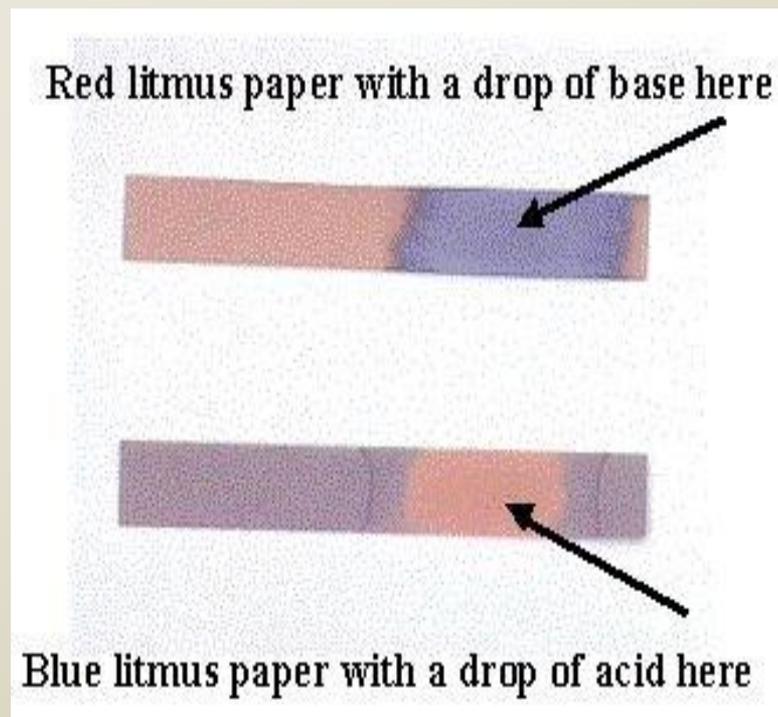
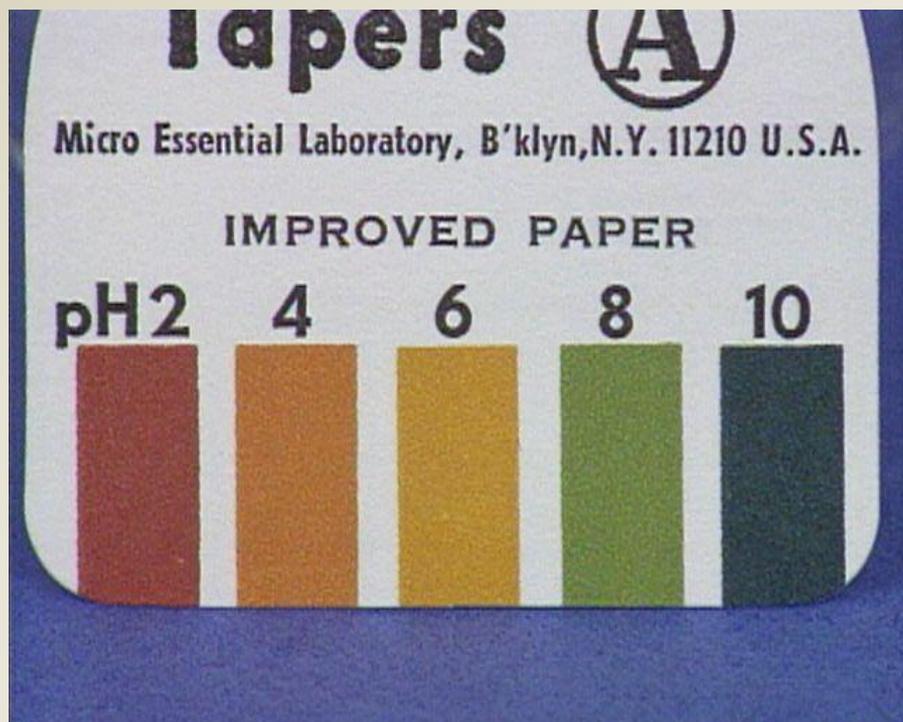
Lugol's solution

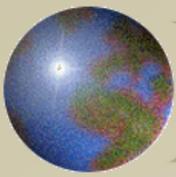
Stained with Lugol's solution





113. Wide range pH paper can be used to determine the acidity or basicity of a solution.





114. Data tables are used for organizing scientific data.

Percent of Students Using Cigarettes in the Past 30 Days
2002

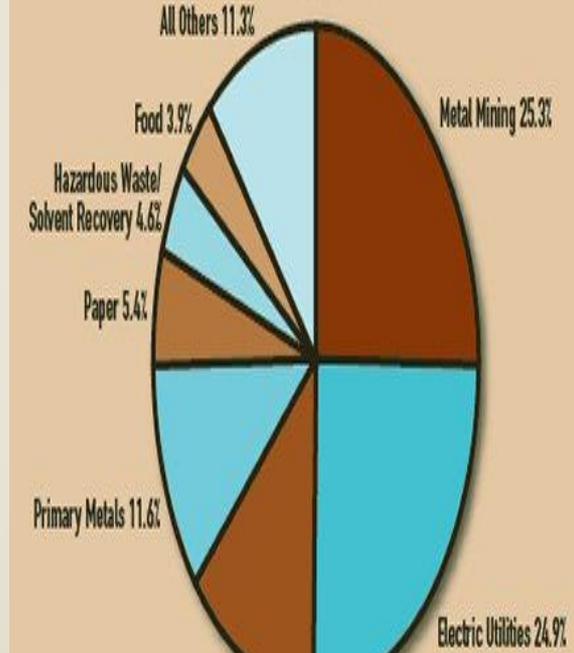
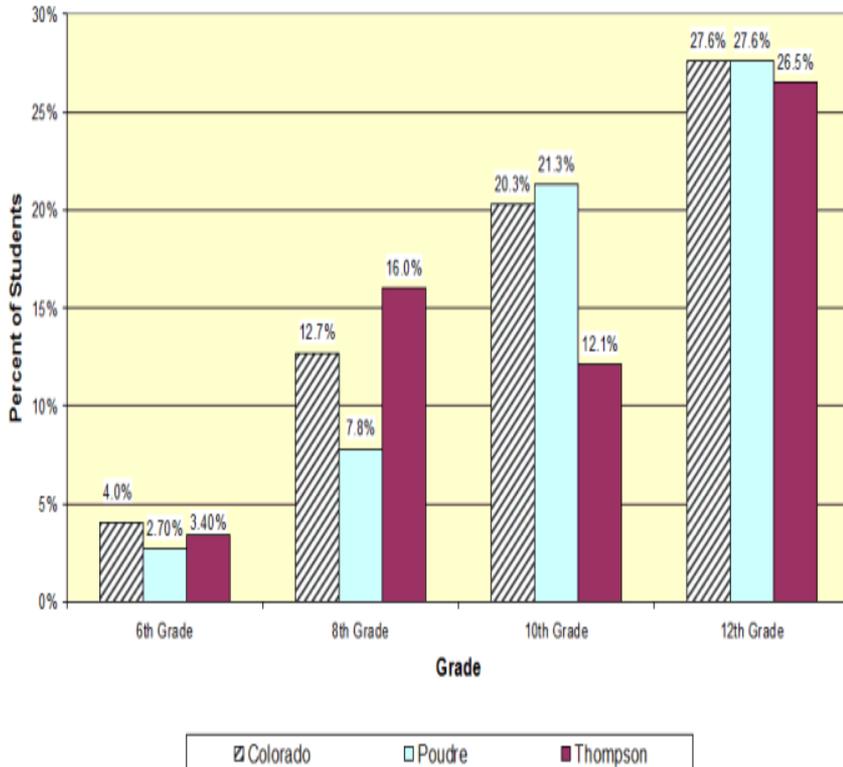
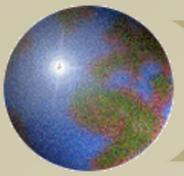
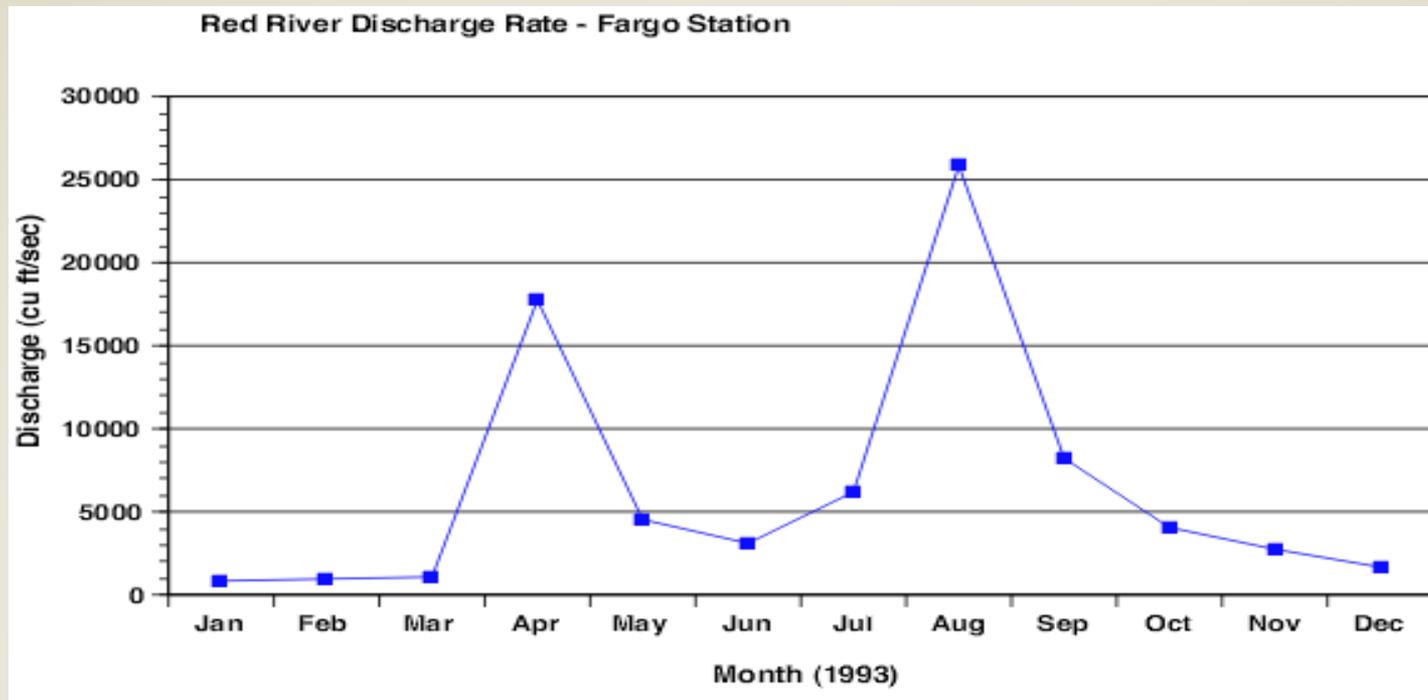


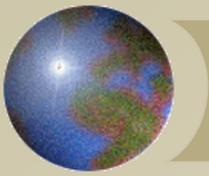
Table 3.15-1: Census Data Summary for the Study Area (Cont.)

Entity	Total Population	Race	% of Total Population by Entity	% of Total State Population	Families HPL*	% Individuals HPL*					
City of Cheyenne	105,707	White	80,660	0.125%	16%	19,8%					
		Black or African American	1,3%								
		American Indian or Native American	1,3%								
		Asian	1,2%								
		Native Hawaiian or other Pacific Islander	0,2%								
		Other	4,6%								
		Two or More Races	2,3%								
		Hispanic or Latino (of any race)**	9,5%								
		City of Colorado	14,742				White	10,6%	0.25%	13,6%	18%
							Black or African American	0,4%			
American Indian or Native American	1,2%										
Asian	0,9%										
Native Hawaiian or other Pacific Islander	0,1%										
Other	4,9%										
Two or More Races	2,4%										
Hispanic or Latino (of any race)**	16,2%										
Town of Bould	628			White	9,5%	0.01%	18,5%	25,1%			
				Black or African American	0,6%						
		American Indian or Native American	0,8%								
		Asian	2,3%								
		Native Hawaiian or other Pacific Islander	0,3%								
		Other	1,3%								
		Two or More Races	3,3%								
		Hispanic or Latino (of any race)**	2,8%								



115. Use a line graph when there are two sets of numerical data. (the independent variable is placed on the X axis)





116. Be sure the axes are labeled and start at zero and are divided into evenly spaced intervals.

