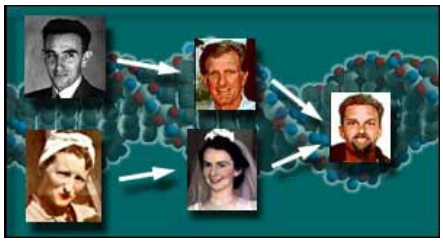
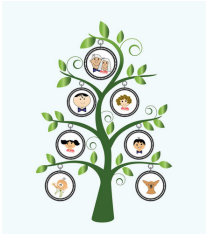
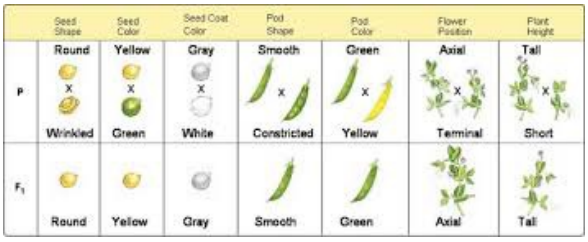
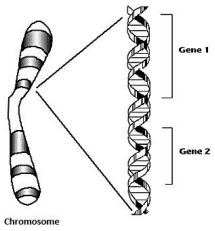
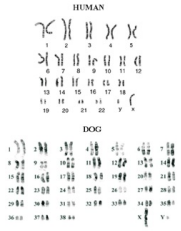
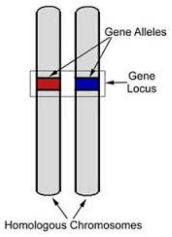
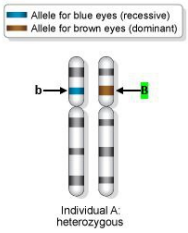
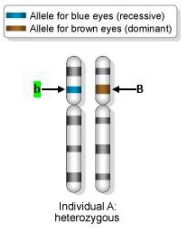
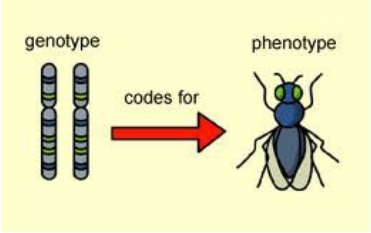
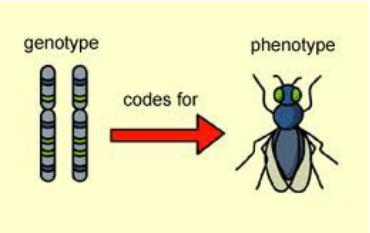
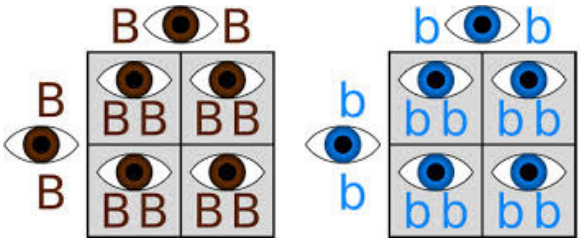
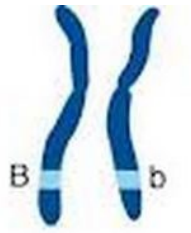
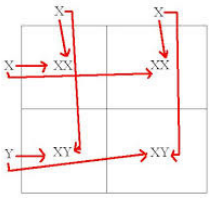
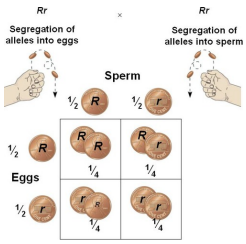
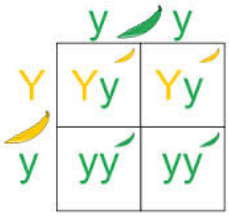
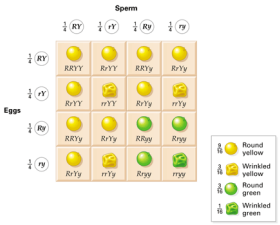
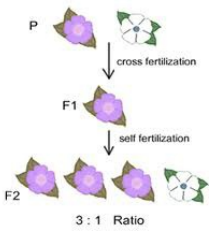
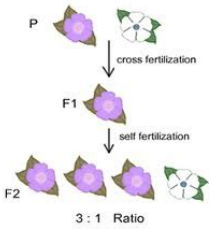
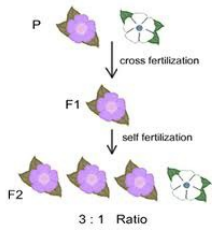
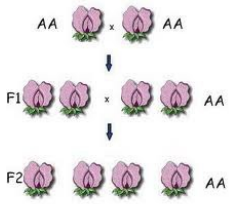
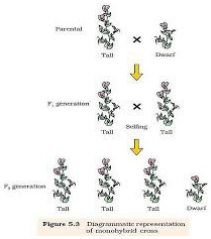
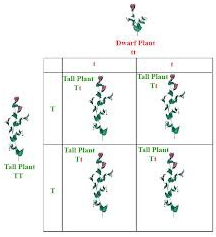
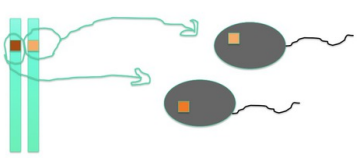
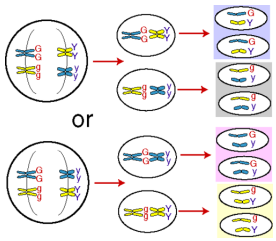
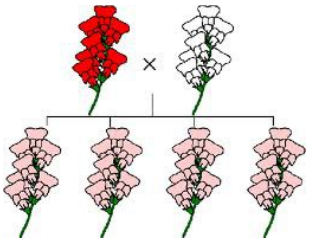
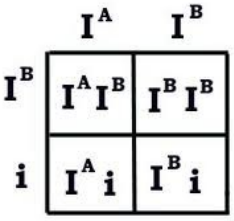
genetics	 the study of heredity
heredity	 the passing of traits from one generation to the next
trait	 a specific characteristic that varies from one individual to another
gene	 sequence of DNA that codes for a protein and thus determines a trait
genome	 the entire "library" of genetic instructions in DNA that an organism inherits

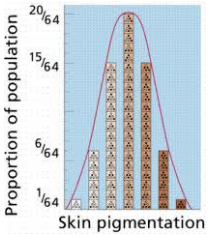
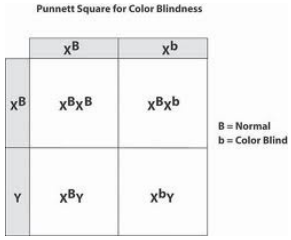
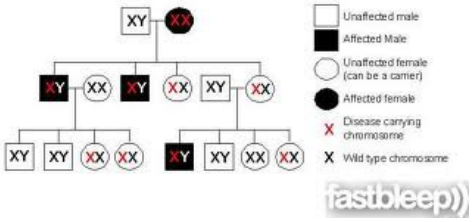
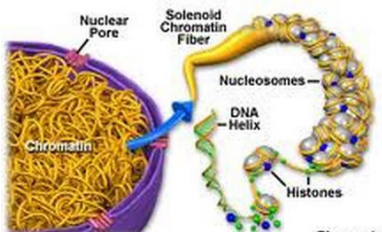
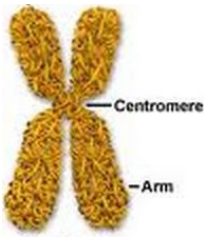
Gregor Mendel	 father of genetics
allele	 alternative form of a gene (one member of a pair) located at a specific position on a specific chromosome (a letter)
dominant allele	 an allele that produces the same phenotype whether its paired allele is identical or different (capital letter)
recessive allele	 an allele that produces its characteristic phenotype only when its paired allele is identical (lowercase letter)
genotype	 the combination of alleles located on homologous chromosomes that determines a specific characteristic or trait (the allelic combination such as Bb)

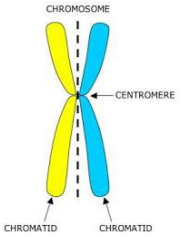
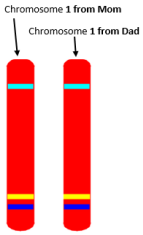
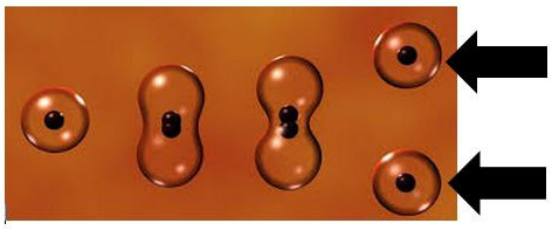
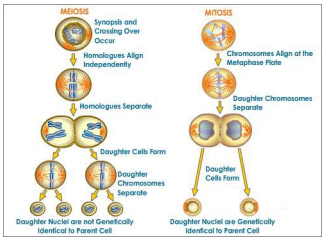
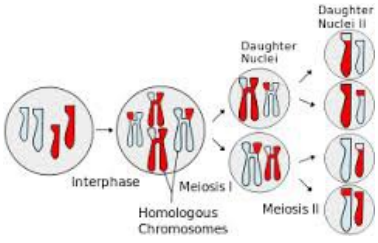
phenotype	 the observable physical or biochemical characteristics of an organism, as determined by the genotype (the expressed trait such as brown eyes)
homozygous	 term used to refer to an organism that has two identical alleles for the same trait (ex. BB or bb)
heterozygous	 term used to refer to an organism that has two different alleles for the same trait (ex. Bb)
Punnett square	 diagram showing the gene combinations that might result from a genetic cross
gamete (sex cell)	 specialized cell involved in sexual reproduction (sperm or egg)

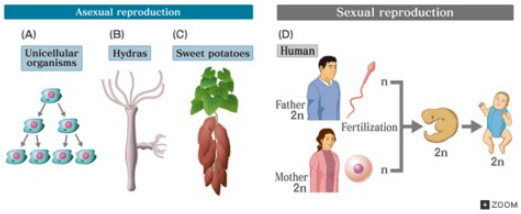
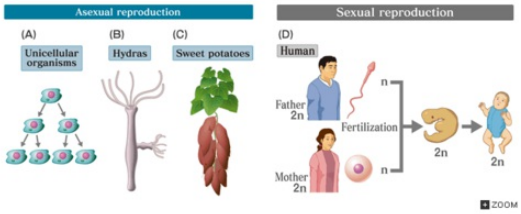
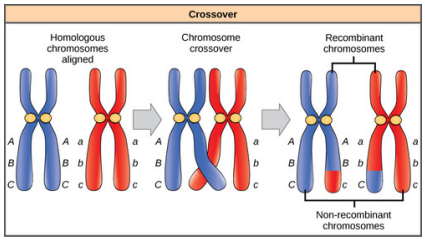
probability	 the possibility of different outcomes (percentage or ratio)
monohybrid cross	 a one-trait cross (ex. color)
dihybrid cross	 a two-trait cross (ex. color & shape)
P generation	 parental generation is the first generation involving two individuals that are mated to predict or analyze the genotypes of their offspring
F1 generation	 first filial generation is the generation resulting immediately from a cross of the first set of parents (P generation)

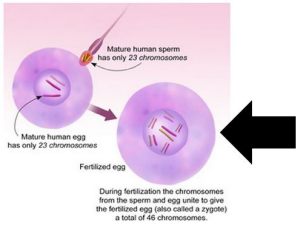
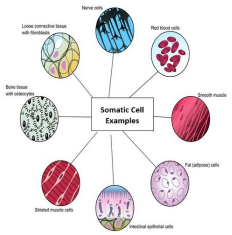
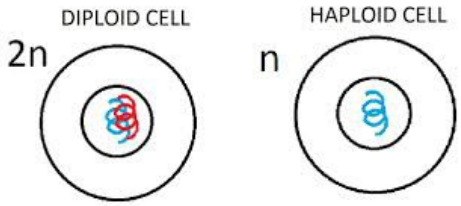
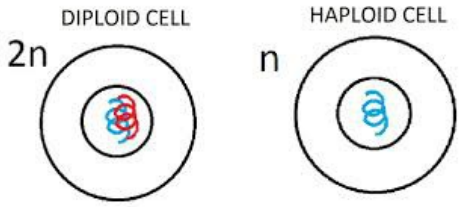
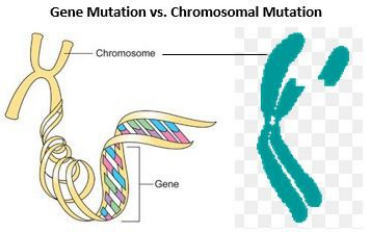
F2 generation	 second filial generation is the generation resulting from a cross between two F1 individuals
purebred	 offspring that are the result of mating between genetically similar kinds of parents; opposite of hybrid; same as true breeding
hybrid	 offspring that are the result of mating between two genetically different kinds of parents; opposite of purebred
Principle of Dominance	 when individuals with contrasting traits are crossed, the offspring will express only the dominant trait
Law of Segregation	• Allele pairs separate and each goes into a different gamete  states that allele pairs separate, or segregate, during gamete formation

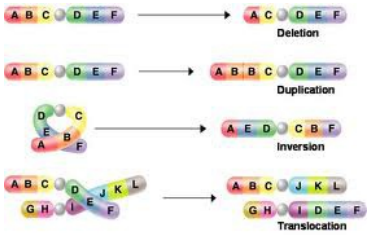
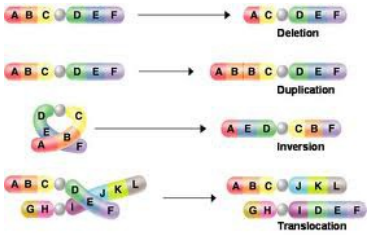
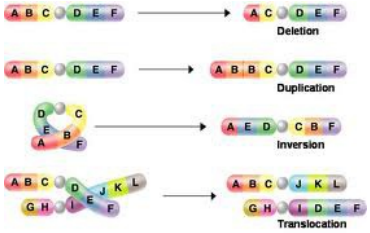
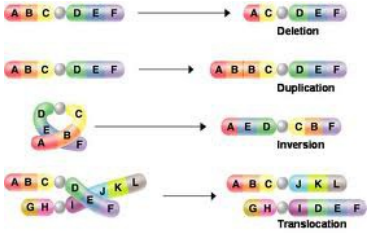
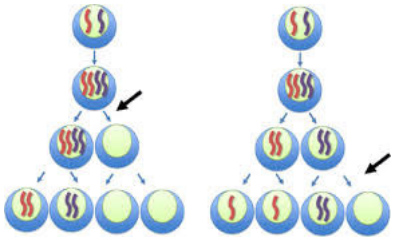
Law of Independent Assortment	 states that genes for different traits can segregate independently during the formation of gametes
non-Mendelian inheritance	 refers to any pattern of inheritance in which traits do not segregate in accordance with Mendel's laws (ex. incomplete dominance, codominance, multiple alleles, polygenic traits, sex-linked traits)
incomplete dominance	 when one allele is not completely dominant over the other, or blending occurs (ex. Red + White = Pink)
codominance	 occurs when BOTH alleles of a gene are expressed in an individual (ex. Black + White = Black & White Speckled)
multiple allele traits	 traits that are controlled by more than two alleles (ex. ABO blood typing = A allele, B allele, & O allele)

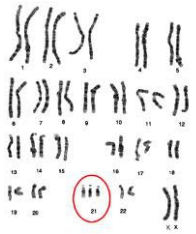
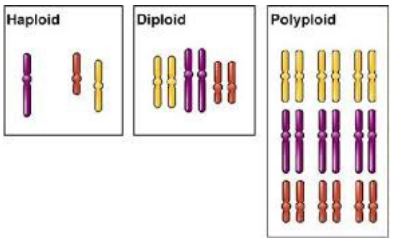
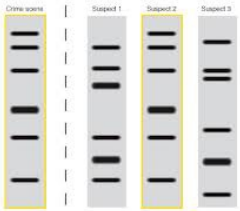
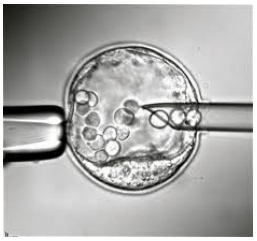
polygenic traits	 a trait controlled by two or more genes; produce a wide range of phenotypes
sex-linked traits	 a trait genetically determined by an allele located on the sex chromosome
pedigree chart	 a diagram that shows the occurrence and appearance or phenotypes of a particular gene or organism and its ancestors from one generation to the next
chromatin	 unraveled and long DNA (during interphase)
chromosome	 condensed, coiled, and shorted DNA (this occurs during mitosis and meiosis)

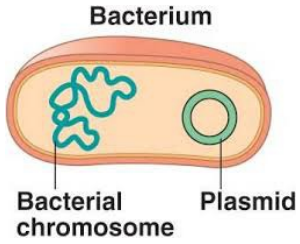
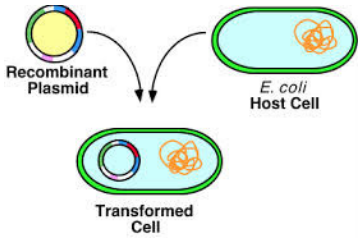
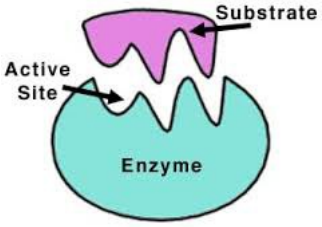
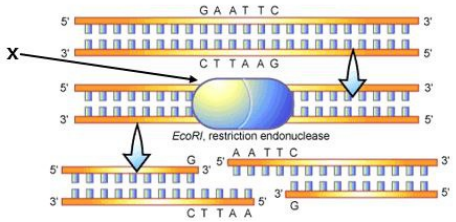
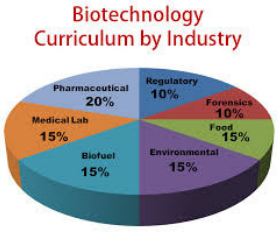
chromatids	 the two identical halves of a single replicated eukaryotic chromosome and joined at the centromere
homologous chromosomes	 chromosome pairs of approximately the same length, centromere position, and staining pattern, with genes for the same characteristics at corresponding places (one homologous chromosome is inherited from the mother; the other from the father)
daughter cells	 new cells
mitosis	 a type of cell division that results in two genetically identical daughter cells each with the same number of chromosomes of the parent cell
meiosis	 a type of cell division that results in four genetically different daughter cells each with half the number of chromosomes of the parent cell (also known as reduction division)

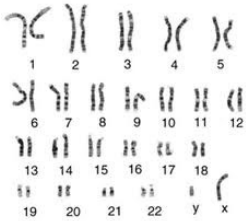
sexual reproduction	 process by which two cells from different parent unite to produce the first cell of a new organism
asexual reproduction	 process by which a single parent reproduces by itself
crossing over	 process in which homologous chromosomes exchange portions of their chromatids during meiosis (also called gene shuffling)
genetic variation	 genetic differences within a species
fertilization	 a process in sexual reproduction in which a sperm unites with an egg to make the first cell of a new organism, or zygote

zygote	 fertilized egg
somatic cell	 body cell (non-sex cell)
haploid (N)	 term used to refer to a cell that contains only a single set of chromosomes and therefore only a single set of genes (Humans N = 23)
diploid (2N)	 term used to refer to a cell that contains both sets of homolgous chromosomes (Humans 2N = 46)
chromosomal mutation	 mutation that affects the number or structure of whole chromosomes

deletion chromosomal mutation	 a mutation that involves the loss of all or part of a chromosome
duplication chromosomal mutation	 a mutation that produces extra copies of parts of a chromosome
inversion chromosomal mutation	 a mutation that reverses the direction of parts of a chromosome
translocation chromosomal mutation	 a mutation that occurs when part of one chromosome breaks off and attaches to a different chromosome
nondisjunction	 the most common error in meiosis and occurs when homologous chromosomes fail to separate

trisomy	 a condition in which an extra copy of a chromosome is present in the cell nuclei, causing developmental abnormalities
polyploidy	 condition in which an organism has extra sets of chromosomes because a complete set of chromosomes failed to separate during meiosis (ex. 3N or 4N)
DNA fingerprinting	 an individual's unique sequence of DNA base pairs, determined by exposing a sample of the person's DNA to molecular probes
genetic engineering	 the process of making changes in the DNA code of living organisms
genetically modified organism (GMO)	 one that has artificially acquired one or more genes from the same or different species

plasmid	 circular DNA found in bacteria
recombinant DNA	 DNA produced by combining DNA from different organisms (DNA is cut out of one organism and recombined with another organism's DNA)
enzyme	 protein that speeds up chemical reactions in organisms
restriction enzyme	 DNA-cutting enzymes found in bacteria
biotechnology	 the use of living organisms or other biological systems in the manufacture of drugs or other products or for environmental management, as in waste recycling

karyotype	 a picture of an organism's genome and can be used for chromosomal anlysis