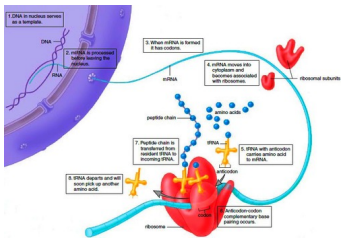
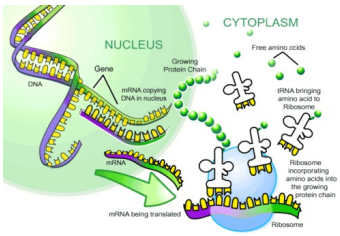
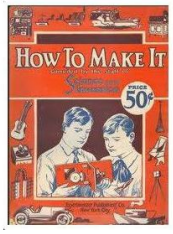
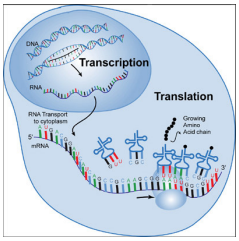
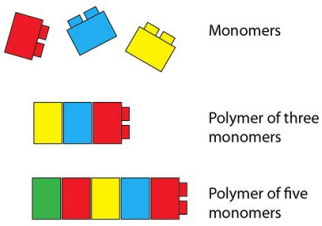
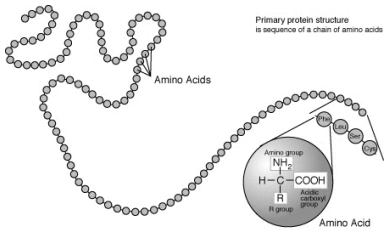
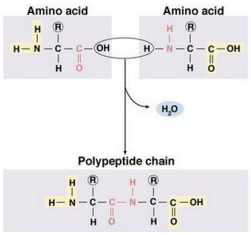
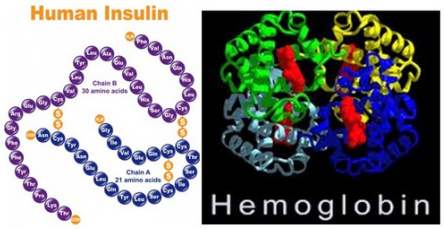
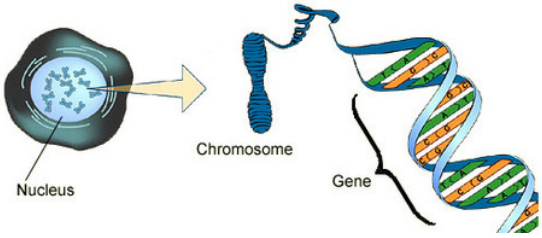
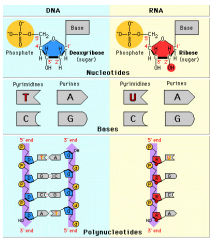
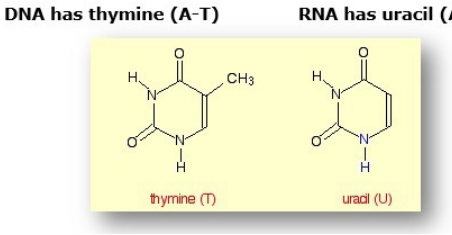
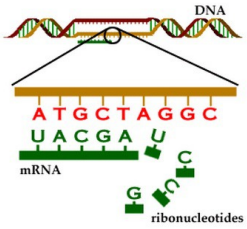
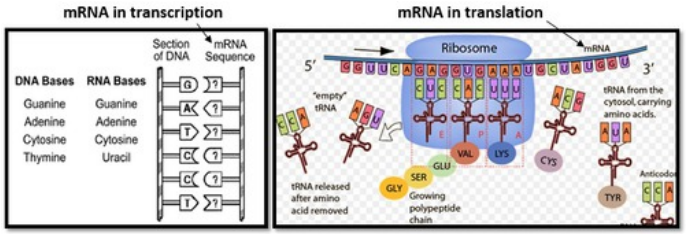
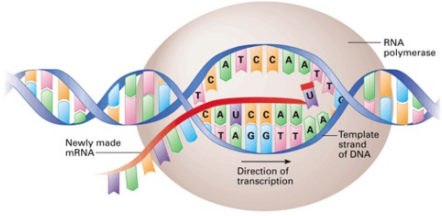
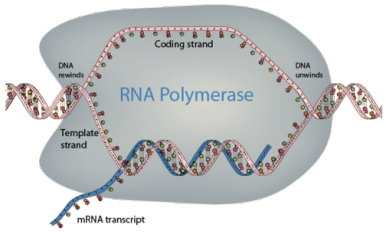
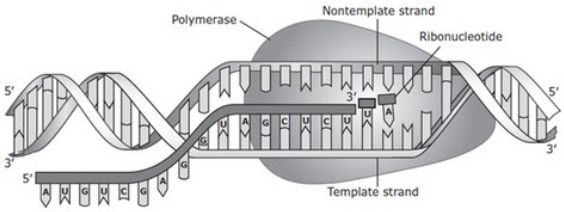
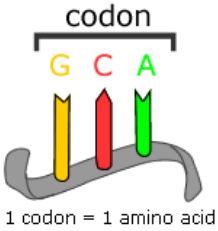
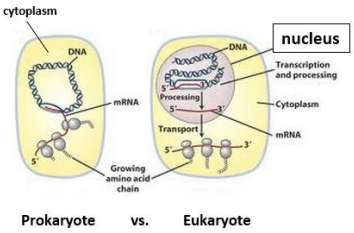
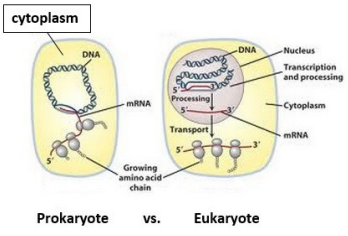
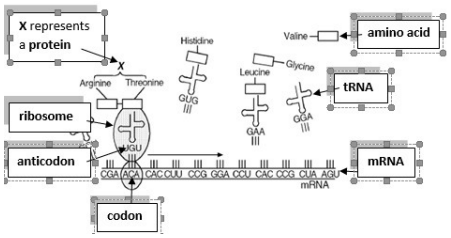
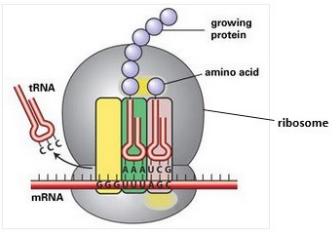
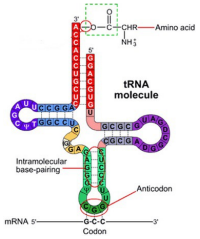
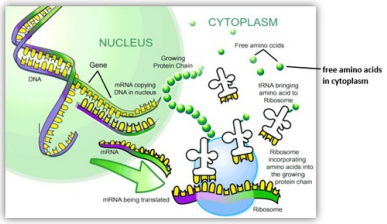
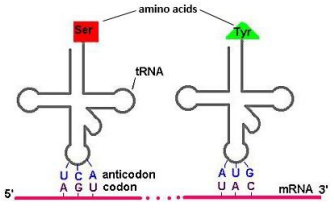
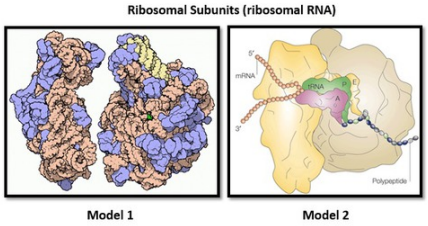
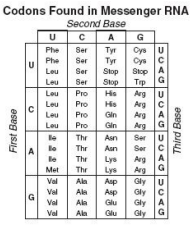
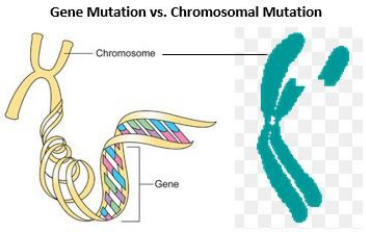
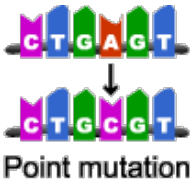
model	 a representation (drawing or 3D) of an object, law, theory or event used as a tool for understanding the natural world; all have limitations
biochemical process	 chemical process that occurs in living organisms such as protein synthesis, cellular respiration, photosynthesis, etc.
synthesis	 to make
protein synthesis	 to make a polypeptide (protein) through transcription and translation
amino acid	 monomer, or building block, of a polypeptide (protein)

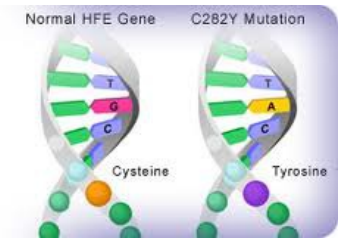
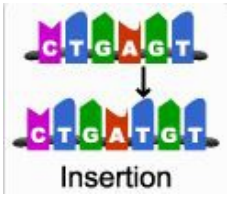
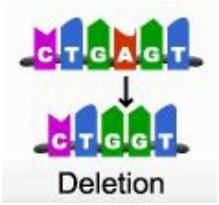
polypeptide	 chain of amino acids; a protein contains one or more of these
peptide bond	 name of bond that holds amino acids together
protein	 specifically designed to build or operate a component of a living cell (ex. human insulin & hemoglobin)
trait	 a characteristic of an organism that is determined by protein structure & function (ex. hitchhiker's thumb)
gene	 section of DNA that codes for a protein and thus determines a trait

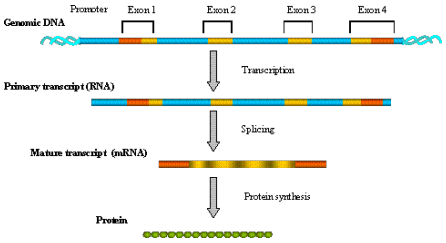
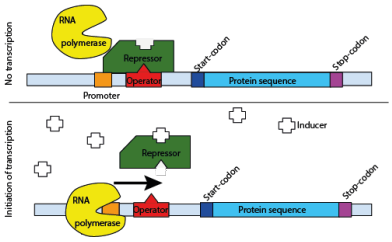
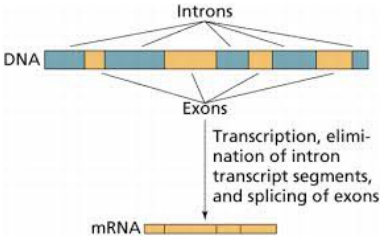
DNA vs. RNA	 deoxyribose sugar vs. ribose sugar, thymine vs. uracil , double strand vs. single strand
uracil	 nitrogenous base specific to RNA in place of thymine (A-U)
transcription	 process where a part of DNA is copied into a complementary sequence of messenger RNA
messenger RNA (mRNA)	 type of RNA that carries a copy of the genetic code from the DNA to the ribosomes
template strand (in transcription)	 the DNA strand that is used as the code to "build" a complementary strand of mRNA

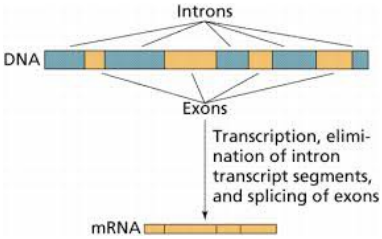
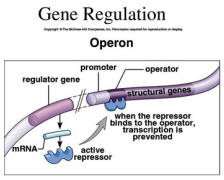
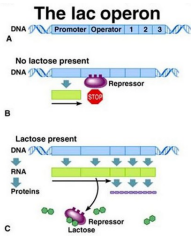
RNA polymerase	 enzyme that assembles the mRNA complementary strand by joining ribonucleotides
ribonucleotide	 nucleotide that has ribose as the sugar; monomer of RNA
codon	 three-nucleotide base sequence (triplet) on DNA and mRNA that codes for a single amino acid
location of transcription in eukaryotes	 nucleus
location of transcription in prokaryotes (bacteria)	 cytoplasm

translation	 decoding of a mRNA sequence into a polypeptide chain / protein
location of translation in ALL cells	 at the ribosomes
transfer RNA (tRNA)	 type of RNA that transfers the amino acids to the ribosome
location of "free-floating" amino acids	 cytoplasm
anti-codon	 three-nucleotide base sequence (triplet) on tRNA that codes for an amino acid

ribosomal RNA (rRNA)	 type of RNA that makes up ribosomes and aids in translating mRNA into a protein
genetic code (mRNA codon chart)	 the 4-letter code; always use the chart reading the mRNA strand
mutation	change in a DNA sequence that affects genetic information
gene mutation	 mutations that produce changes in a gene as opposed to changes in whole chromosomes
point mutation	 mutation involving change in one nucleotide; example is a substitution

substitution mutation	 point mutation in which one nitrogeneous base (nucleotide) is changed to another
frame-shift mutation	 mutation that shifts the "reading frame" of the genetic message; includes insertions and deletions
insertion mutation	 frame-shift mutation where a nucleotide is added to the genetic material
deletion mutation	 frame-shift mutation where a nucleotide is deleted from the genetic material
silent mutation	 mutation that does not result in a change to the amino acid sequence of a protein; also called neutral

significance	importance
significance of gene mutations	can be neutral with no effect, harmful by producing defective proteins/traits, or beneficial by increasing chance of survival
gene expression	 the multi-step process of turning the code of a gene into its final product (most often a protein)
promoter	 region of DNA that indicates to RNA polymerase where to bind in order to make RNA
introns	 parts of DNA that do NOT code for a protein; get "cut" out of mRNA

exons	 parts of DNA that do code for a protein; get left in mRNA
gene regulation	 a process where a cell determines which genes it will express and not express; turning genes "on and off"
The lac operon	 example of gene regulation in bacteria when the lac gene is turn off or turned on to make an enzyme (protein) to break down lactose sugar
stem cells	 cells that can differentiate into a variety of specialized cells in multicellular organisms
cell differentiation	 the process directed by the DNA code for converting stem cells into more specialized cell types in multicellular organisms

specialized cells	 cells with specific structures and functions (ex. blood cells, epithelial cells, sperm cells, guard cells, etc.)
role of DNA in cell differentiation	holds the code that determines which traits (proteins) will be expressed to make a cell specialized
role of RNA in cell differentiation	carries the code from DNA and helps assemble the proteins that make cells become specialized
role of environmental factors in cell differentiation	radiation, toxic chemicals, temperature, nutrition, etc. can alter gene expression and cell differentiation