Cell

- Why are most cells small?
- What are the main differences between prokaryotic cells and eukaryotic cells, and know examples of prokaryotic cells and eukaryotic cells.
- Major features of cells and their function; includes:
  - Plasma membrane, Cytoplasm, Nucleus, Cytoskeleton, Mitochondria, Ribosomes, Endoplasmic reticulum (smooth and rough), Golgi body, Vesicles, lysosomes
- Functions of the plasma membrane
- Know the main components in the plasma membrane and the function of each component.
- Be able to draw a membrane.
- Be able to identify what can pass freely through a membrane and what can’t pass freely.
- Know how small molecules are transported into the cell, know the differences between passive diffusion, facilitated diffusion, and active transport. Know what molecules each mode can transport
- Know how things are transported in and out of a cell using a vesicle
- What are lysosomes, what disorder is associated with a missing enzyme in lysosomes
- What are the functions of cytoskeleton and examples of cytoskeleton
- What are the functions of microtubules
- What cytoskeleton makes up cilia and flagella
- Know the functions of microfilaments, what protein makes up microfilaments
- Know the functions of intermediate filaments

Definitions: Prokaryotic cells, eukaryotic cells, semi-permeable, osmosis, hypertonic, hypotonic, isotonic, hydrophobic compounds, non polar, hydrophillic compounds, polar, passive transport, active transport, simple diffusion, facilitated diffusion, exocytosis, endocytosis, phagocytosis, pinocytosis, nucleolus, nuclear envelope, nucleoplasm, chromatin, cristae, apoptosis

DNA

- What is the structure of DNA – and their nucleotides
- What molecules are bonded together – order
- What type of bonds holds the subunits together
- What are the four bases
- Which bases are paired together
- Be able to draw DNA. Use one letter abbreviations for the bases, phosphates, and sugars (you don’t need to draw the structure of the base, sugar and phosphate)
- What are the steps of DNA replication
- When does DNA replication take place
• What is helicase’s and DNA polymerase’s roll
• What supplies the energy to be used to build the new strand
• What are mutations, what are point mutations
• Be able to recognize an incorrectly paired sequence
• What are the possible outcomes of mutations
• What is a positive aspect of mutations
• What is the structure of proteins
• What are the structural differences between DNA and RNA, what are the structural similarities?
• Determine the complementary mRNA sequence from a DNA sequence.
• Know the parts of the cell and their role in protein synthesis of an exported protein. Include protein modification (including the golgi, ER, etc)
• What is transcription and translation
• Where does RNA polymerase bind to the DNA
• What is the function of RNA polymerase
• What are the steps of transcription
• What are the steps of translation
• Be able to “read” the mRNA to make a protein, given the table of codons to amino acids.
• Know the types of RNA, their functions, and where in the cell do they complete their function

Definitions: DNA polymerase, RNA polymerase, helicase, semiconservative replication, complimentary strand, point mutation, mutagens, base pairs, gene, tRNA, mRNA, rRNA, promotor region, polypeptide chain, peptide bond, transcription, translation, codon, anticodon

Cellular Metabolism

• What is Cellular respiration and Anaerobic Fermentation and what are the differences between them.
• What are the four steps of aerobic cellular respiration, what happens in each step, what are the starting molecules, what comes out of each step, where in the cell does each step occur, how many ATP and NADH/FADH\textsubscript{2} are produced in each step.
• Describe in detail how is ATP made using the electron transport chain
• What is the role of ATPsynthase, H\textsuperscript{+}, O\textsubscript{2}, NADH and FADH\textsubscript{2} and the electron transport chain in ATP production?
• Know the overall picture of cellular respiration (summary slides)
• What is the role of oxygen in cellular respiration, what steps produce carbon dioxide
• What is anaerobic fermentation, what steps are involved in fermentation, what end products are produced in humans, is oxygen required? when is it used.

Definitions: Aerobic cellular respiration, anaerobic fermentation, ATP synthase, metabolism
Intro to Anatomy and Physiology: Body Organization and Integumentary System

- How does negative and positive feedback work, be able to describe the examples of negative and positive feedback given in class and in the textbook, identify the sensor, control center, and effector for each example
- What are the three cell-cell junctions and their functions
- Identify the body cavities, what is their location and what is contained in the cavities
- What are the four types of membranes, their functions and locations
- What are the functions of the integumentary system
- Components of the integumentary system and their functions
- What are the two layers of the skin. What type of tissues comprise each layer, where are the layers located
- What layer lays underneath the skin, what tissue type comprises this layer
- What are the three types of skin cancer, where do they originate, which is more likely to spread to other parts of the body
- What are melanocytes, what is their function

Definitions: Tissue, Organ, organ system, Tight junctions, Adhesion junctions, Gap junctions, Exocrine glands, Endocrine glands, Homeostasis, Hormones, hypodermis, diaphragm, sebum, sebaceous glands, keratin, basement membrane, lacunae, voluntary control, involuntary control, hyperthermia, hypothermia, melanin, hypodermis