

**Comprehensive Final Focus: these are all subjects we will revisit (many extensively) in the second quarter.**

1. Negative feedback vs. positive feedback mechanisms
2. Hydrogen bonding
3. Forms of stored energy used by cells
4. Hydrolysis and condensation reactions
5. Enzymes: what types of molecules they are, what they do
6. pH, acids, bases, buffers
7. The structure of the cell membrane; the roles of membrane proteins
8. Movement of particles/water: diffusion, osmosis & hydrostatic pressure
9. How stuff gets in and out of cells: what types of materials can pass across the membrane without help, what materials need proteins or vesicles to pass, leak channels, facilitated diffusion, active transport, vesicular transport
10. The  $\text{Na}^+$ - $\text{K}^+$  exchange pump
11. Serous membranes
12. Osteoblasts, osteoclasts, osteocytes & osteoprogenitor cells
13. Hormones affecting bone growth and maintenance
14. Skeletal muscle cell contraction events
15. Muscle energetics
16. Cardiac muscle and smooth muscle (all info from notes)
17. Nervous system organization (systems & divisions)
18. Capillary permeability in different areas of the brain
19. Types of sensory receptors (intero, extero, proprio; within intero and extero, mechano, chemo, etc)
20. Membrane potentials: resting, depolarized, hyperpolarized. The movement of which ions leads to depolarization? The movement of which ions leads to hyperpolarization? Don't worry about the details of the events in the action potential of a neuron.
21. Absolute refractory period
22. All roles of  $\text{Ca}^{2+}$  discussed thus far
23. Roles of the hypothalamus, pons, medulla, epithalamus
24. Relative concentrations between the extracellular fluid and intracellular fluid of:  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$ ,  $\text{Ca}^{2+}$ , proteins-
25. Effects of sympathetic activity on body functions (ie, increased heart rate, nutrient mobilization, etc) and  $\text{Nt}$  used on effectors
26. Effects of parasympathetic activity on body functions and  $\text{Nt}$  used on effectors