- Draw a basic neuron. What are the different parts, and what, very generally speaking, do they do?

- Do all neurons connect to other neurons?

- What is the electrical state of a neuron at rest? How is this state maintained?

- What does the sodium potassium ATPase do? How does it work?

- Why are neurons energetically demanding cells?

- The balance between an _____ gradient and a _____ gradient produces the equilibrium potential of a charged ion across a permeable membrane.

- What equation can be used to find the equilibrium potential for a single ion? Define each term, and explain two parameters that go into determining the constant for an ion.

- What are the two types of membrane potential? Cells can produce a _____ potential or an _____ potential.

- What is a graded hyper- or depolarization? What channels cause them? What stimuli would they occur in response to? What can be the result of them (discuss spatial/temporal summation here).

- What must happen for a neuron to be triggered to fire an action potential?

- Describe the phases that a neuron goes through as it moves from rest through firing an action potential back to rest. Explain how channels open and close, which ions flow in what direction when, and how the membrane voltages changes as a result.

- What properties of the neuron and the action potential ensure that action potentials move in only one direction down the axon (ie don't move backward)?

- What is the effect of axon diameter on rate of action potential propagation? What kinds of behaviors would be controlled by neurons with larger diameters?

- Can an action potential generated by one patch of the neuronal membrane travel infinitely down the axon?

- What controls the rate of action potential decay (two factors)?

- How do neurons prevent action potentials from decaying to zero and make sure that the action potential is propagated all along the axon? Think about the two factors that control rate of decay, and how cells can manipulate these two factors.

- What happens if myelin breaks down?

- How does lidocaine work to prevent you from feeling pain?

- How does scorpion venom cause pain? How do grasshopper mice resist this venom?