Stimulation of a Neuron and the Resulting Action Potential

Directions: Go to this site and download the neuron activity.
https://phet.colorado.edu/en/simulation/neuron

*Start the simulation and answer the following questions.*

1. Before starting the simulation, be sure the following items are selected:
   a. Normal speed
   b. Show all ions
   c. Concentrations
   d. Put the zoom selector (upper left) in the middle

2. BEFORE clicking "Stimulate" – what ions are moving and in which direction?

3. BEFORE clicking "Stimulate" – what are the concentrations of each ion?

Ion concentration **Inside**	Ion concentration **Outside**
K+	K+
Na+	Na+

4. Click "Stimulate" and watch what happens.

5. Click "Stimulate" and this time select "Potential Chart" and observe.

6. Click "Stimulate" and pause at 2.5 milliseconds. (The time can be adjusted back and forth in case you miss). Now complete the ion concentration chart at this time:

Ion concentration **Inside**	Ion concentration **Outside**
K+	K+
Na+	Na+

7. How do the ion concentrations compare from resting to 2.5 milliseconds?

8. What is happening at 4 milliseconds?

9. Using the graph below, sketch the entire action potential from resting to 20 milliseconds.

Membrane Potential vs. Time
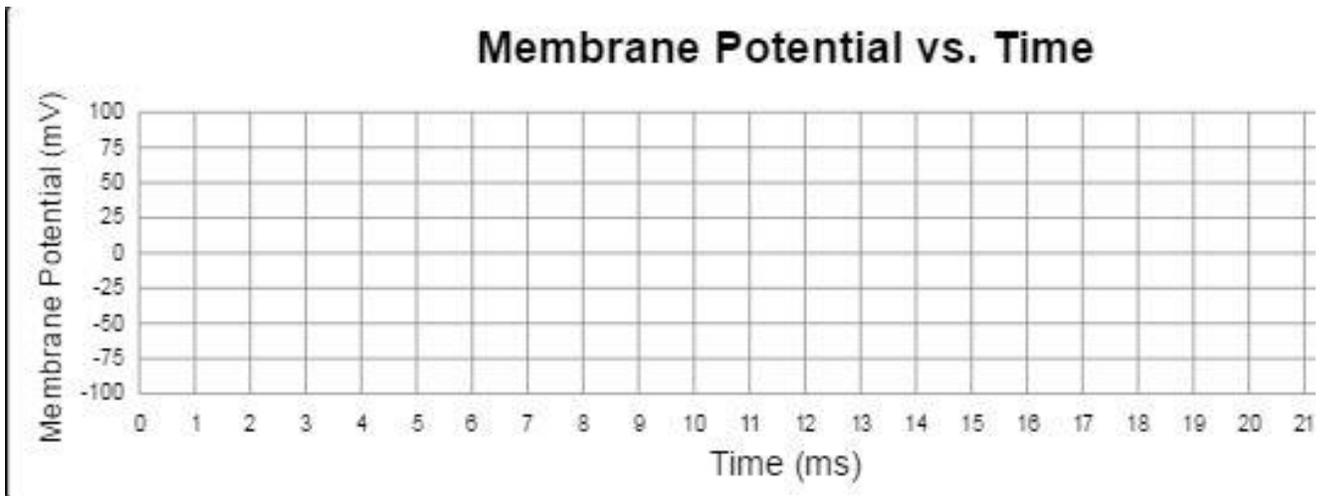
10. Choose "Show Charges" and run the simulation fast this time. What charge is normally outside the membrane? _____ What charge is normally inside the membrane? _____