

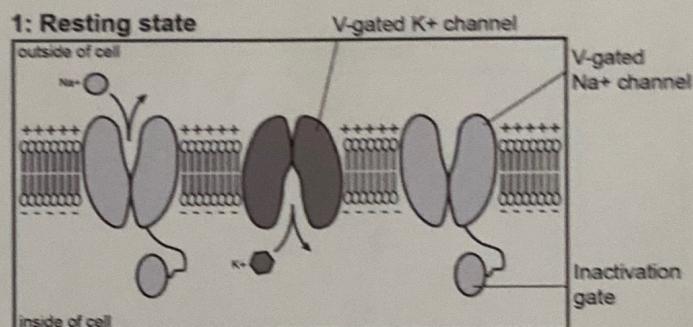
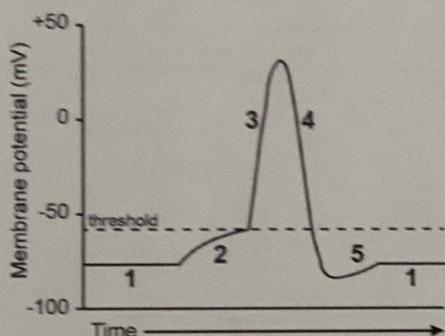
7/27/2019

1) The Action Potential

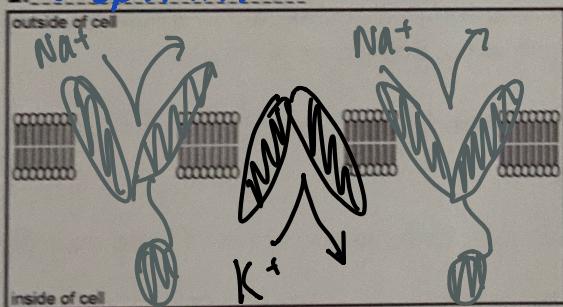
1. The top left panel shows a voltage plot of an action potential, with the phases numbered. The five diagrams of the membrane illustrate different phases of an action potential. Above each diagram, write the name of the corresponding action potential phase.

2. On the first diagram (resting state), which channel(s) is(are) missing, yet crucial to explain the maintenance of the resting potential? **Sodium Potassium Pump, leak channels**

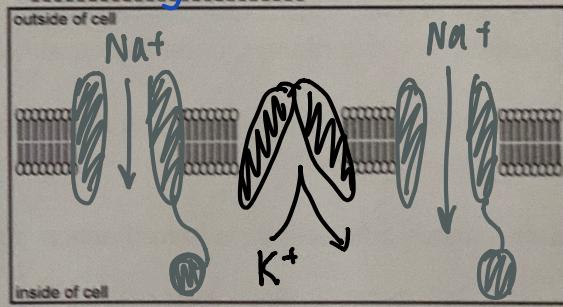
3. Complete each diagram, showing the state of the channels, using the 1st diagram as a guide.



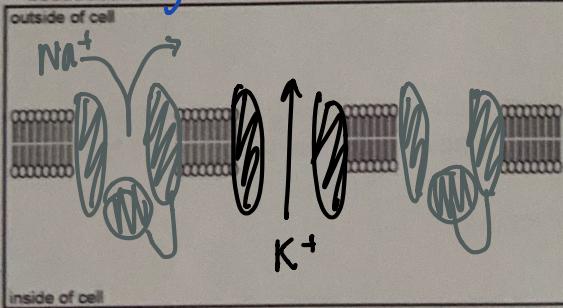
2: depolarization



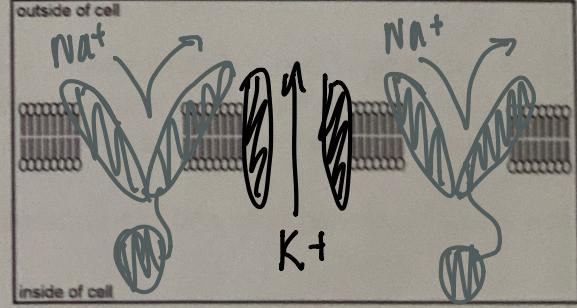
3: rising



4: falling

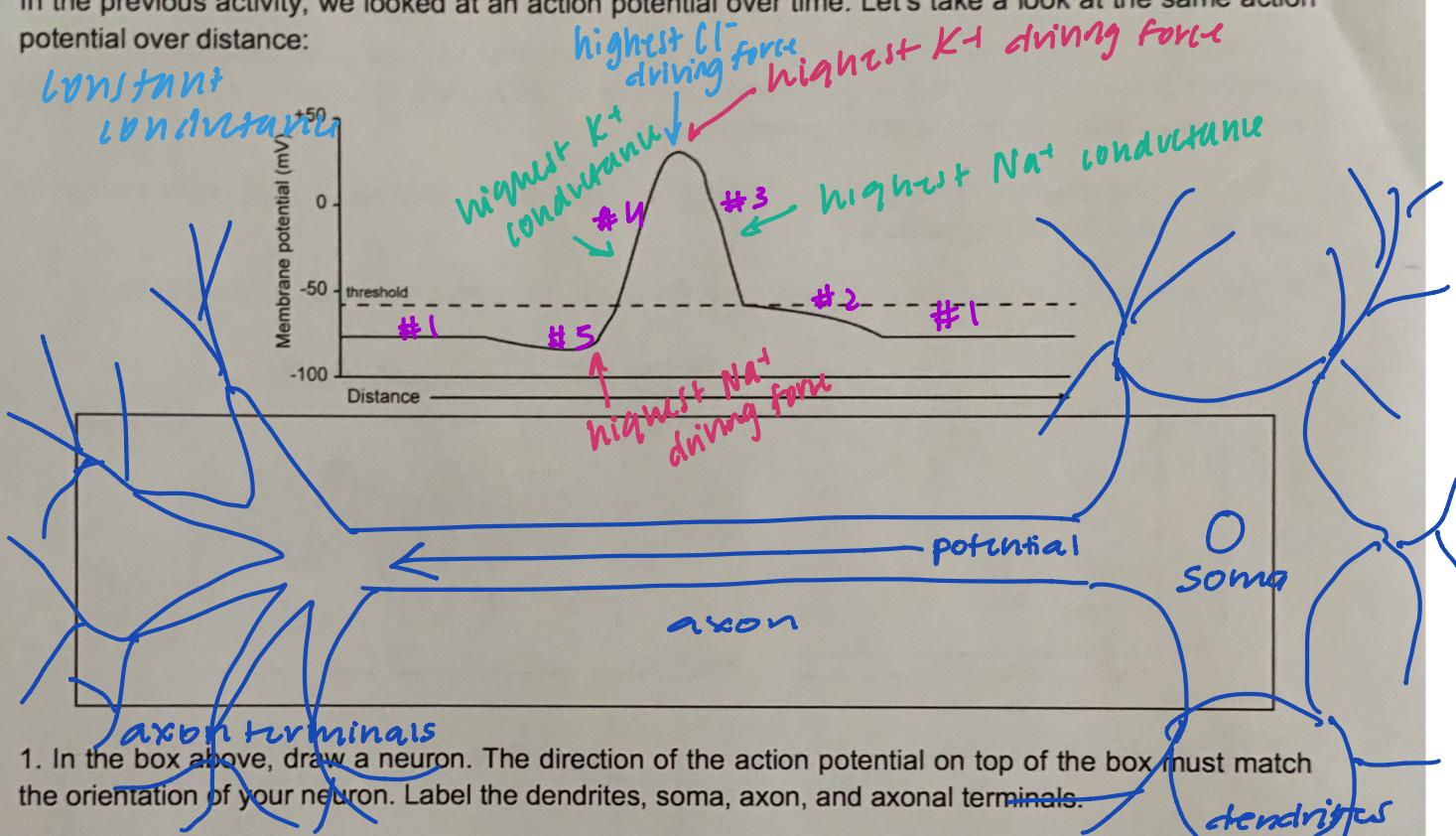


5: overshoot



2) Action Potential Propagation

In the previous activity, we looked at an action potential over time. Let's take a look at the same action potential over distance:



1. In the box above, draw a neuron. The direction of the action potential on top of the box must match the orientation of your neuron. Label the dendrites, soma, axon, and axonal terminals.
2. On the trace of the voltage recording above, label the different action potential phases (use the same number code as activity 1).

3. Briefly explain how scientists record action potentials over time (see in activity 1) and over distance (above). *Over time: one electrode*

Over distance: multiple evenly-spaced electrodes, same time

4a. On the recording above, indicate where:

- The driving force for sodium is the strongest, where potassium driving force is the strongest
- The conductance for sodium is the highest, where potassium conductance is the highest

4b. How about the driving force and conductance for chloride?

5. How would you make the action potential above wider? *voltage-gated*

- deaktivieren some Na^+ and K^+ channels so membrane de/pol. happens slower
- Myelination - decrease extracellular Na^+ /intracellular Cl^-

absolute refractory period: cannot trigger another action potential

