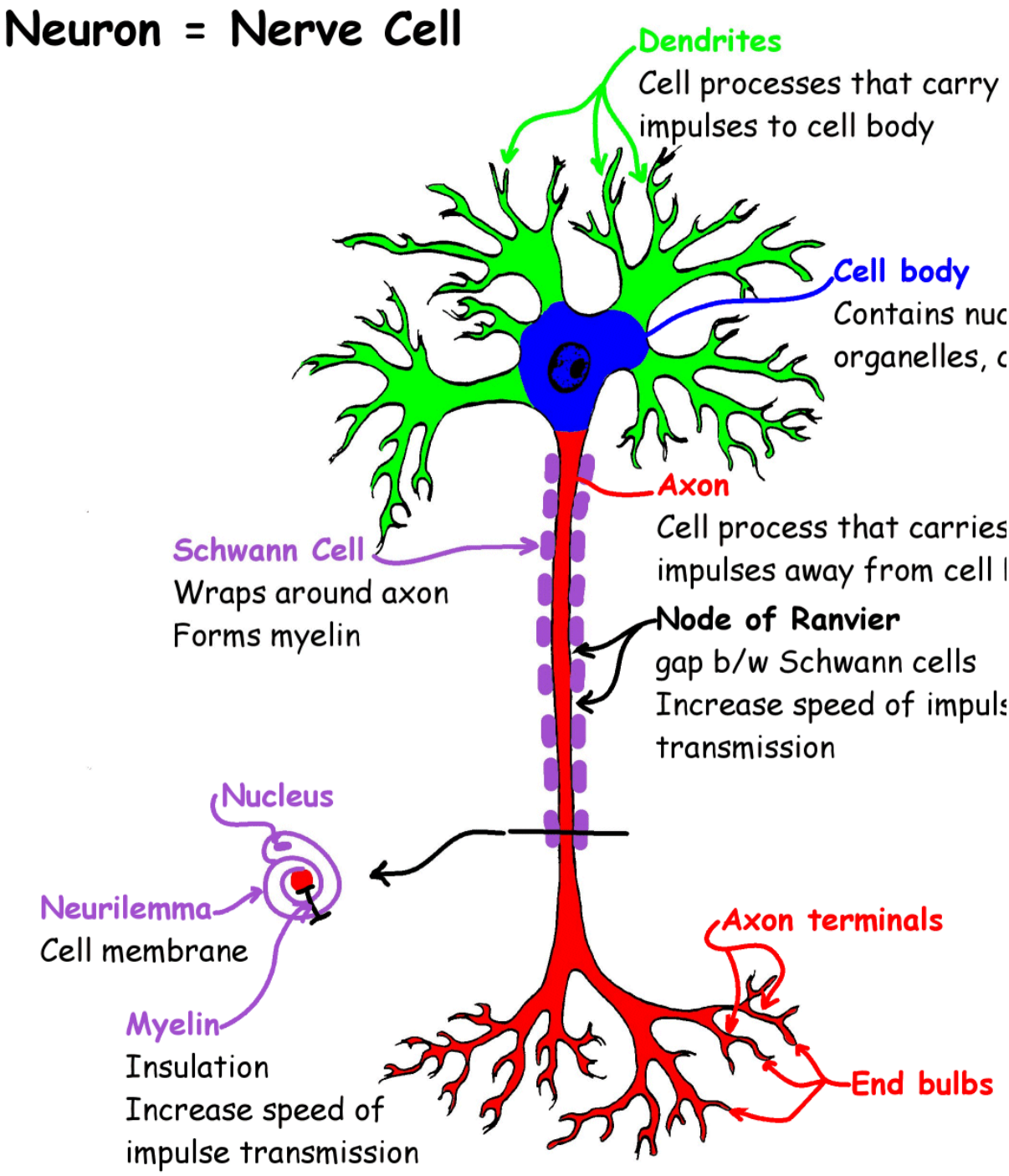
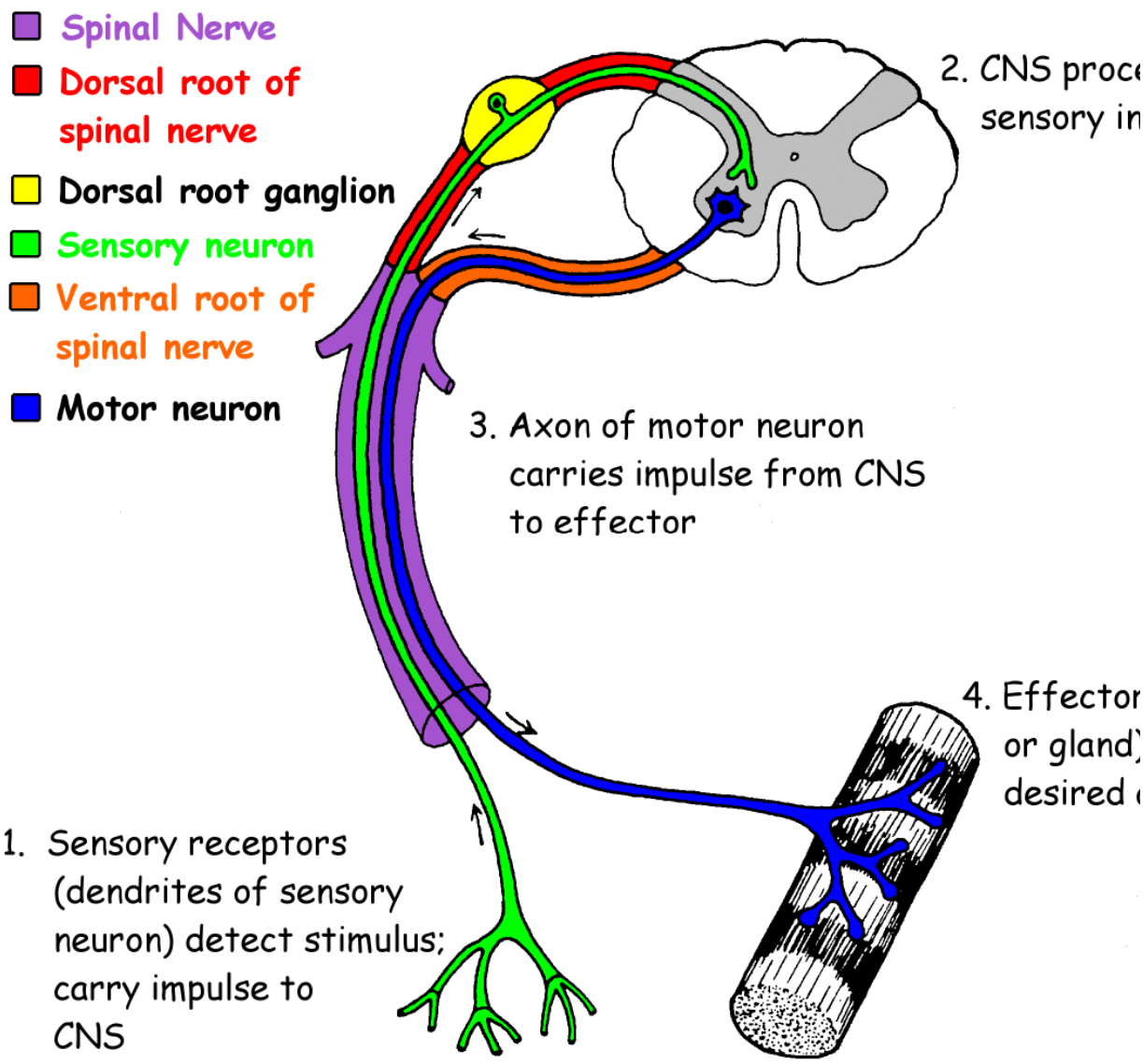
AP BIOLOGY NAME_____

ACTIVITY2.15 DATE_____HOUR____

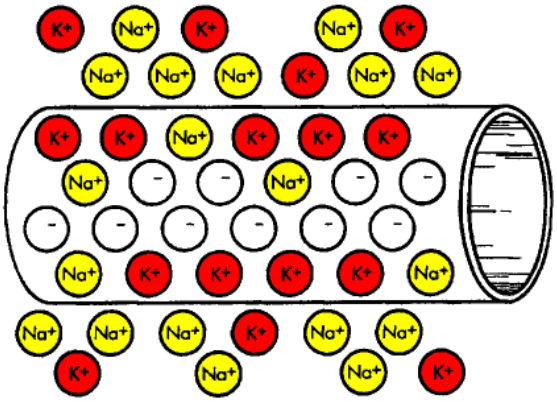
NERVOUS SYSTEMS



SIMPLE REFLEX



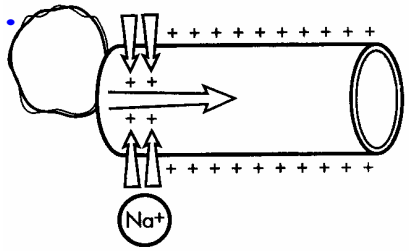
Resting Potential



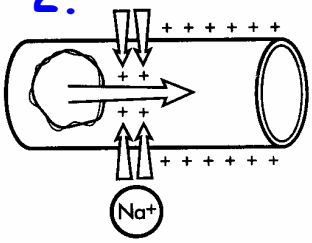
- Membrane polarized
- Inside cell more negative than outside
- Difference in charge caused by:
  - Large, negatively charted proteins & nucleic acids inside cell
  - Na+/K+ pumps maintaining excess Na+ outside cell and excess K+ inside cell

Action Potential = Wave of depolarization

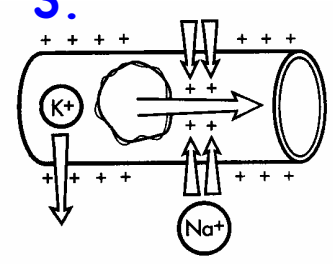
1.



2.

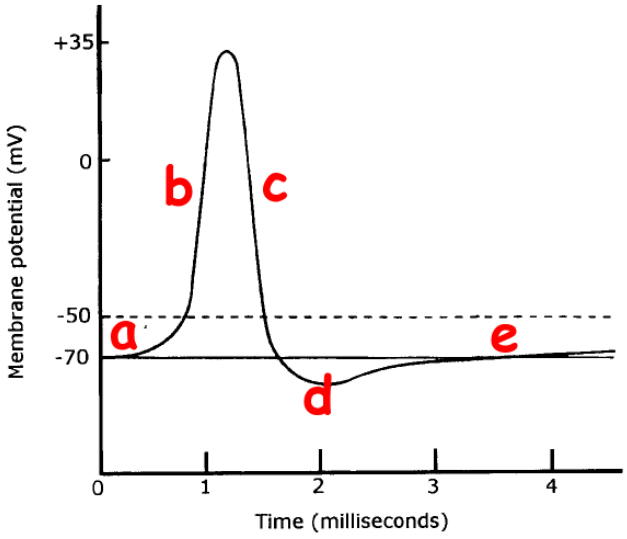


3.



1. Stimulus causes Na+ to enter cell (depolarization)
2. Depolarization in one area causes depolarization in adjacent area
3. Depolarization continues along length of cell

ACTION POTENTIAL – GRAPH



a. Resting potential
-70 mV

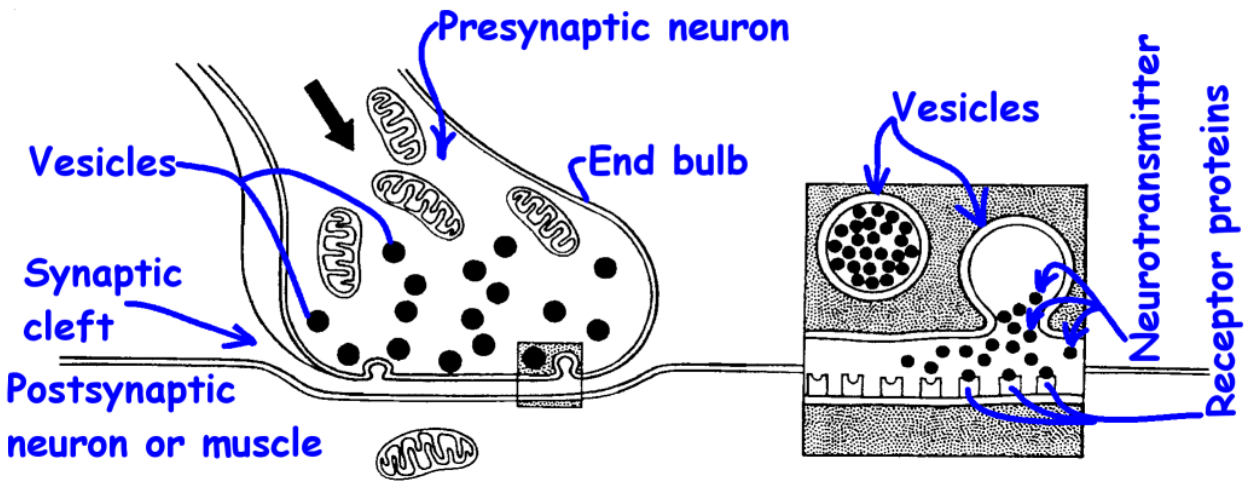
b. Depolarization
- Na+ ion channels (gates) open
- Na+ rush into cell
- Membrane potential changes from –70mV to +35 mV

c. Repolarization
- Na+ gates close & K+ gates open
- K+ rush out of cell
- High K+ outside cell & high Na+ inside cell

d. Hyperpolarization
- More K+ moved out than was necessary
- Neuron cannot be stimulated

e. Refractory period
- Na+/K+ pumps move Na+ out of cell and K+ into cell
- Reestablish original distribution of ions

TRANSMISSION ACROSS A SYNAPSE



What happens?

1. Impulse reaches end bulb
2. Presynaptic membrane depolarizes
3. Ca^{2+} channels/gates open
4. Ca^{2+} enter end bulb
5. Vesicles migrate to presynaptic membrane
6. Vesicles fuse with membrane
7. Neurotransmitter released into cleft
8. Neurotransmitter binds to receptor proteins
9. Postsynaptic neuron depolarizes