Action Potential

1. A resting neuron has a membrane potential of -70mV
2. High concentration of positive sodium ions in extracellular fluid and positive potassium ions and negative ions in the membrane cause the membrane potential to be -70mV
3. A stimulus applied to a neuron causes the membrane of the neuron to be more permeable to sodium ions
4. Sodium ions diffuse into the membrane making the voltage slowly become positive
5. At -55mV, voltage gated sodium channels open and sodium ions flood into the membrane making it massively depolarised. Depolarisation occurs
6. Sodium channels close at +30mV and potassium channels open
7. Potassium ions go out of the membrane because of the concentration gradient and makes the membrane polarised
8. The charge of the membrane becomes negative
9. The potassium pump overcompensates and releases too much potassium which makes the membrane hyperpolarised
10. The sodium-potassium pump works to restore the resting membrane potential by pumping 2 potassium ions out and 3 sodium ions into the membrane. This process happens via active transport (ATP is used)
11. Causes adjacent membrane to become more permeable to sodium ions
12. Triggers successive action potential along the membrane of a neuron

*With myelin sheath*

* Action potential/nerve impulse jumps from gaps in the myelin sheath called the Nodes of Ranvier
* Therefore it is faster
* Sodium and potassium only take effect at the Nodes of Ranvier