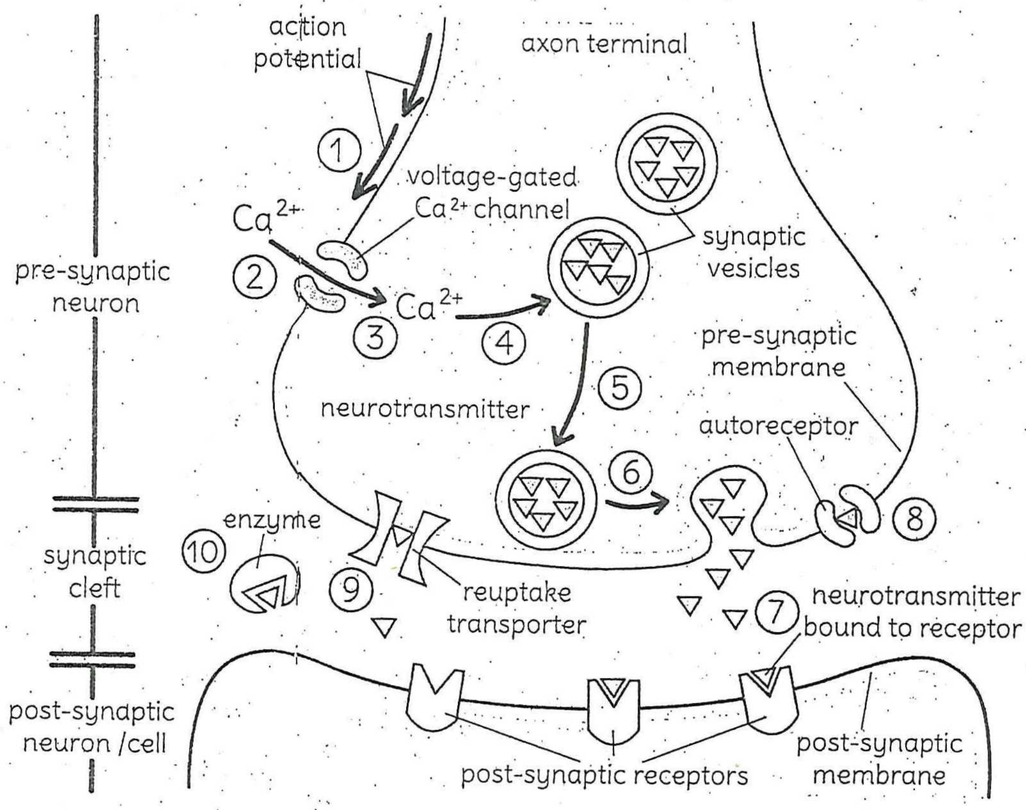
Synapse



Step	Function
1.	The action potential arrives at the axon terminal and depolarizes the pre-synaptic membrane.
2.	The action potential triggers voltage-gated Ca^{2+} channels to open on the pre-synaptic membrane.
3.	Ca^{2+} enters the pre-synaptic neuron.
4.	The presence of Ca^{2+} within the pre-synaptic neuron activates synaptic vesicles.
5.	Synaptic vesicles containing neurotransmitters (e.g. acetylcholine) to migrate to and fuse with the pre-synaptic membrane.
6.	Vesicles are released into the synaptic cleft through exocytosis.
7.	Neurotransmitters diffuse across the cleft (20nm wide) and bind to receptors (e.g. acetylcholine receptor) on the post-synaptic membrane. This either excites (acetylcholine excites) or inhibits the post-synaptic membrane by generating excitatory post-synaptic potentials (EPSPs) or inhibitory post-synaptic potentials (IPSPs) respectively.
8.	In some pre-synaptic neurons, autoreceptors are present that help regulate the function of the pre-synaptic neuron. Autoreceptors bind to the neurotransmitters to provide a feedback loop that regulates the amount of neurotransmitter that is released. The more the autoreceptors bind, the less neurotransmitters are released.
9.	Transporter proteins on the pre-synaptic membrane help with the reuptake of neurotransmitters from the cleft back into the pre-synaptic neuron. This helps to reverse the effects of the neurotransmitter.
10.	Enzymes (e.g. acetylcholinesterase) in the synaptic cleft break down the neurotransmitter to reverse its effects. The products of this breakdown (e.g. acetate and choline) will get reabsorbed back into the pre-synaptic neuron to get reformed into active neurotransmitters again.