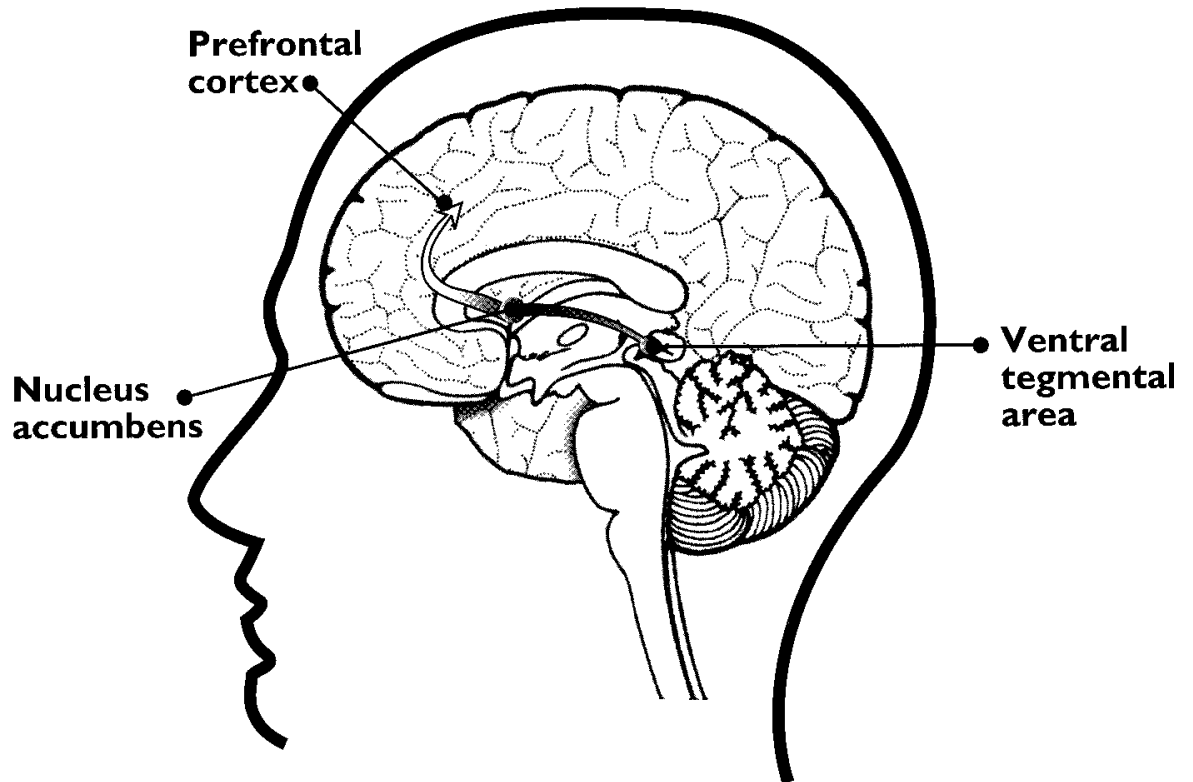
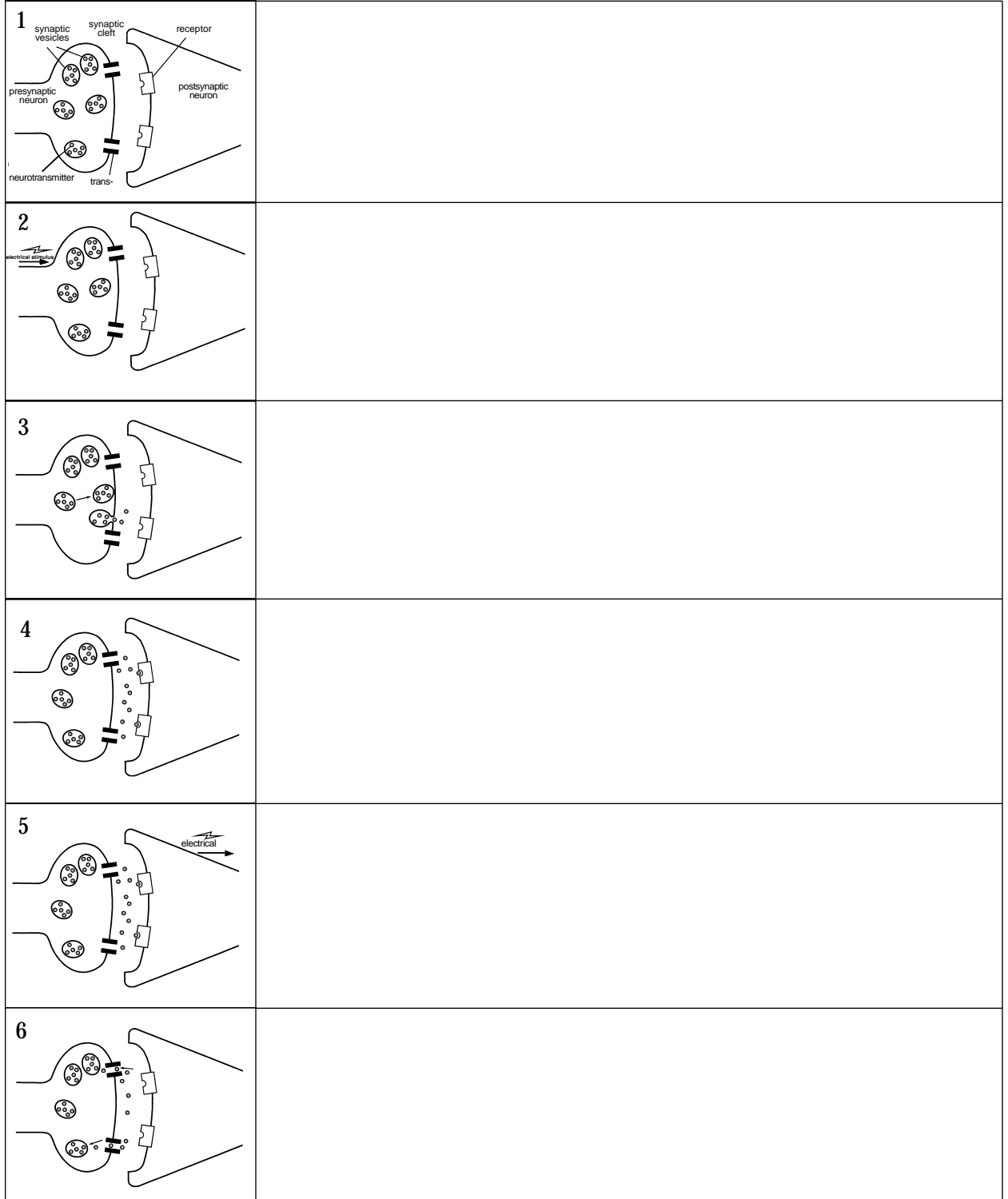


The Reward System



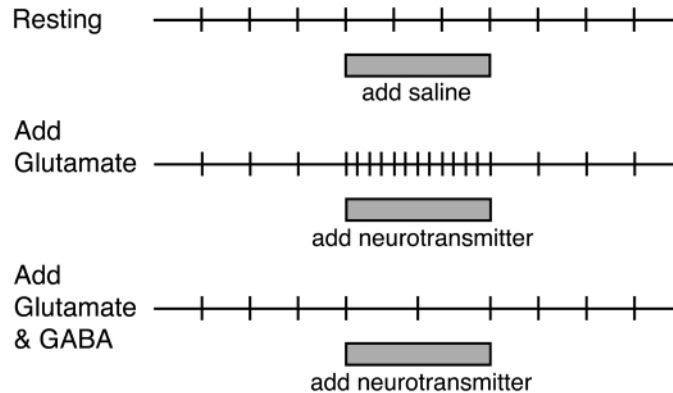
Neurotransmission



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Neurotransmitter Actions

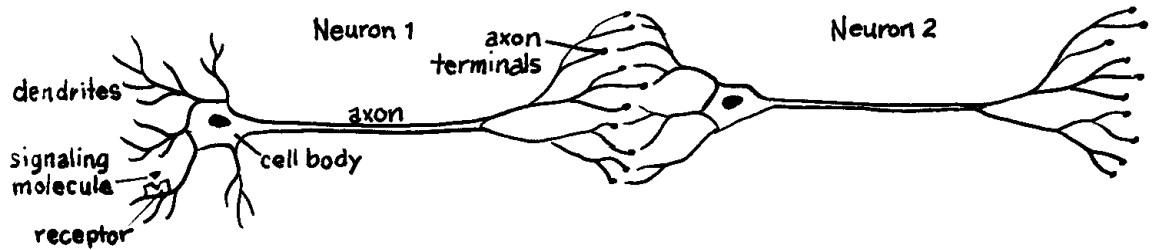
The following diagrams represent recordings of the electrical activity of a neuron over a period of time. Each vertical line on the diagram represents an electrical impulse, or action potential, occurring in the neuron. The first diagram represents a neuron at rest. For the other recordings, a solution containing neurotransmitter was applied to the neuron.



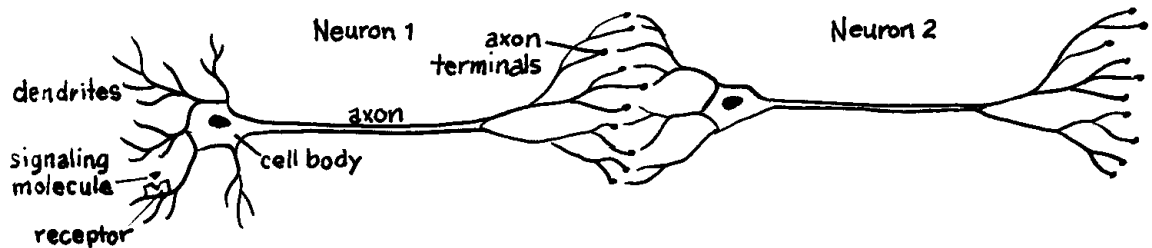
1. Why is saline applied to the resting neuron?
2. When the neurotransmitter glutamate is applied to the neuron, how does its activity change?
3. How does the application of the two neurotransmitters, glutamate and GABA, change the activity of the neuron?
4. Predict how the activity of the neuron would change if only GABA was applied to the neuron.
5. Do all neurotransmitters affect a neuron in the same way?
6. How would the application of glutamate to a neuron change the amount of neurotransmitter released from that neuron? How would the application of GABA to a neuron change the amount of neurotransmitter released from that neuron?

Neurons in Series

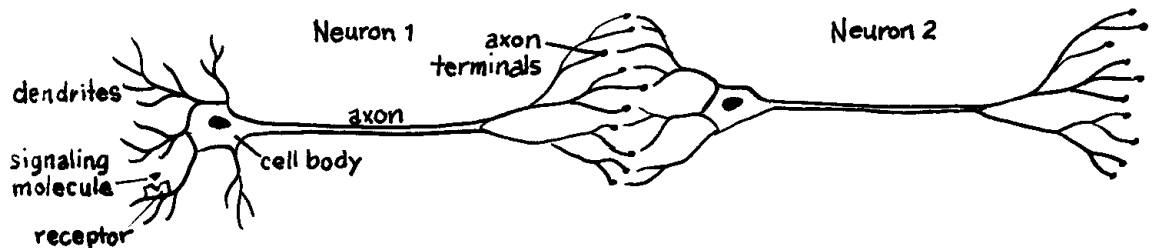
Using what you have learned about the effects of the neurotransmitters glutamate and GABA, determine how the different signals that affect Neuron #1 can change the release of the neurotransmitter dopamine from Neuron #2. Use the chart to help you work through the cases. You can use ↓ to indicate a decrease or ↑ to indicate an increase.



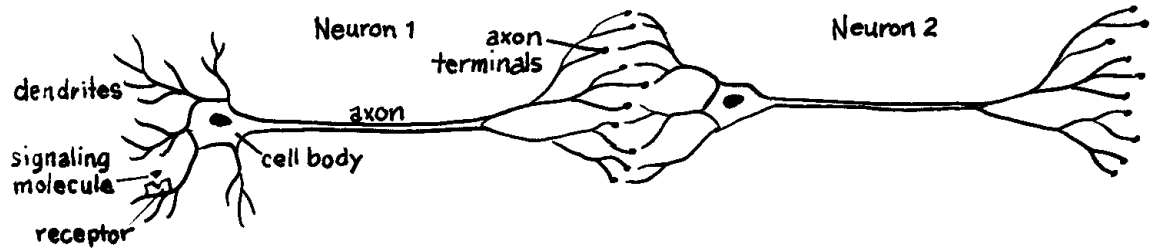
- A. The signaling molecule is inhibitory. Neuron #1 releases glutamate as its neurotransmitter. Neuron #2 releases dopamine as its neurotransmitter.



- B. The signaling molecule is excitatory. Neuron #1 releases glutamate as its neurotransmitter. Neuron #2 releases dopamine as its neurotransmitter.



- C. The signaling molecule is inhibitory. Neuron #1 releases GABA as its neurotransmitter. Neuron #2 releases dopamine as its neurotransmitter.



D. The signaling molecule is excitatory. Neuron #1 releases GABA as its neurotransmitter. Neuron #2 releases dopamine as its neurotransmitter.

| Case | Does the signal molecule excite or inhibit Neuron #1? | Does the activity of Neuron #1 increase or decrease? | Does the amount of neurotransmitter released from Neuron #1 increase or decrease? | What is the name of the neurotransmitter released from Neuron #1? | Is the neurotransmitter released from Neuron #1 excitatory or inhibitory? | Does the activity of Neuron #2 increase or decrease? | Does the amount of dopamine released from Neuron #2 increase or decrease? |
|------|---|--|---|---|---|--|---|
| A | | | | | | | |
| B | | | | | | | |
| C | | | | | | | |
| D | | | | | | | |