

**Study Guide** for Name The Action Potential, a BrainU video

Watch the video **The Action Potential** ([http://brainu.org/files/movies/action\\_potential\\_cartoon.swf](http://brainu.org/files/movies/action_potential_cartoon.swf)) then answer the questions below:

1. Who are the 6 stars of the show?
2. Neurons communicate with each other using an \_\_\_\_\_ which is a small pulse of \_\_\_\_\_.
3. Is the concentration of sodium ions higher inside the cell or outside the cell?
4. Is the concentration of potassium ions higher on the inside or the outside of the cell?
5. Why is the inside of the cell slightly more negative than the outside of the cell?
6. What is the electrical potential across the membrane of a neuron at rest? \_\_\_\_\_ milliVolts
7. What do scientists call it when a neuron becomes less negative?
8. What is it called when a neuron returns to the resting potential?
9. What structure "lives" in the membrane of the cell and what does it do?  
What kind of transport is this?
10. The membrane surface of the neuron is filled with lots of \_\_\_\_\_ and \_\_\_\_\_ channels.
11. What is the difference between the sodium and potassium channels?
12. Which "doors" are opened? \_\_\_\_\_ which are closed?
13. Sodium channels:
  - a. What causes a sodium channel to open?
  - b. What happens when it does?
  - c. Why does this happen?  
What kind of transport is this?
14. Sodium ions rush into the cell causing what?
15. How is "threshold" reached?
16. Eventually what does this depolarization do to the inside sodium channel door?
17. What does all this depolarization do to the potassium channels?
18. Potassium ions:
  - a. What happens to potassium ions when the potassium "doors" open?
  - b. Why does this happen?
  - c. What kind of transport is this?
19. What does the movement of positive potassium ions cause in the cell?
20. What happens to overall membrane potential as the potassium ions diffuse out?
21. Why does the membrane potential "hyperpolarize?"
22. The sodium-potassium pump has a chance to \_\_\_\_\_.
23. The process of action potential takes approximately \_\_\_\_\_.
24. How do sodium ions push the process along?
25. Which direction does the action potential travel?
26. What happens when the nerve terminal becomes depolarized?
27. What do the "tiny droplets" do?