



# LEARNING INTENTION

- Explain the following terms in reference to the transmission of a nerve impulse through a neuron
  - Resting and Action Potential
  - Depolarization and Repolarization
  - Refractory Period
  - Sodium and Potassium gates (voltage regulated)
  - Sodium-potassium pump
  - Threshold value
  - All or none response



# V.O.D NEURONS: HOW THEY WORK

<https://www.youtube.com/watch?v=c5cab4hgmoE>



Electrically active cells are referred to as

## EXCITABLE CELLS



- they harness a difference in electrical charge between the inside and outside of their cell membrane to perform their physiological role.
- excitable cells are more negatively charged on the inside than the outside.
- this electrical potential difference is located immediately adjacent to the cell membrane.



# ELECTRICALLY ACTIVE CELLS

Many different cell types utilise electrical activity to perform their physiological roles.

- Neurons
- Cardiac myocytes
- Skeletal muscle cells
- Some secretory cells (e.g. pancreatic  $\beta$ -cells)

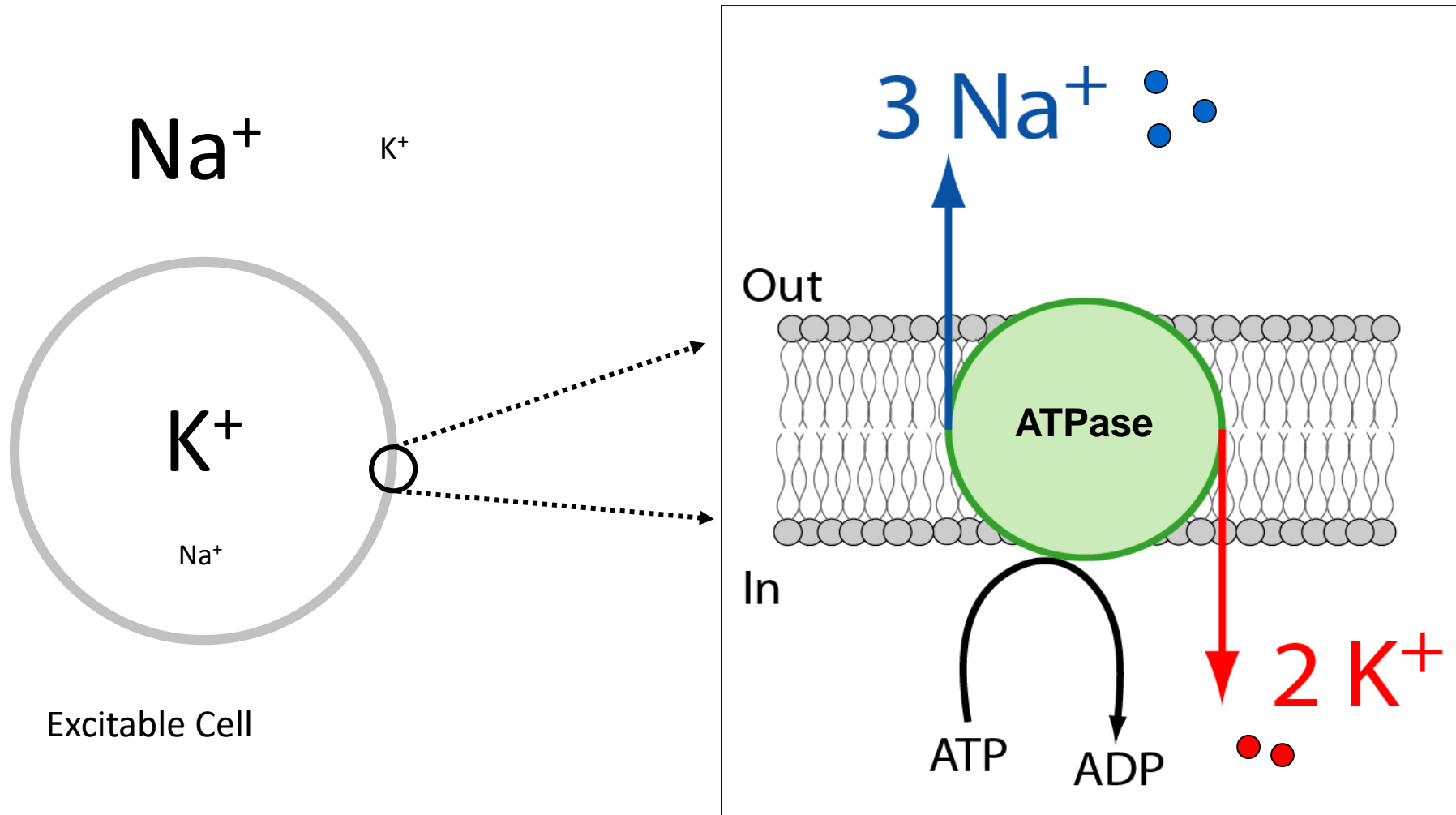


# ELECTRICAL ACTIVITY REQUIRES TWO INITIAL CONDITIONS:

1. A Selectively Permeable cell membrane.
  - Some solutes pass through easily, others do not.
2. A Differential Distribution across the membrane of electrically charged ions in solution.
  - primarily  $\text{Na}^+$  and  $\text{K}^+$  ions

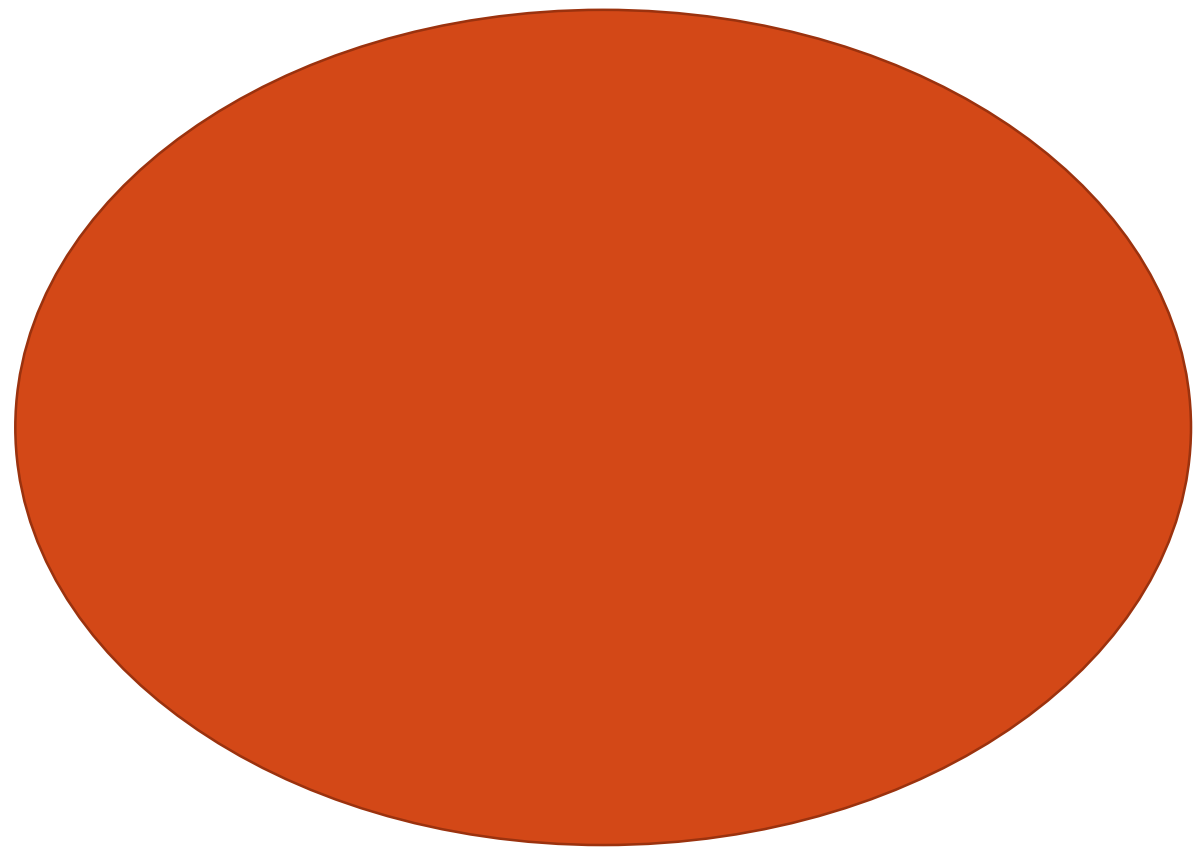


# THE $\text{Na}^+$ - $\text{K}^+$ ATPASE

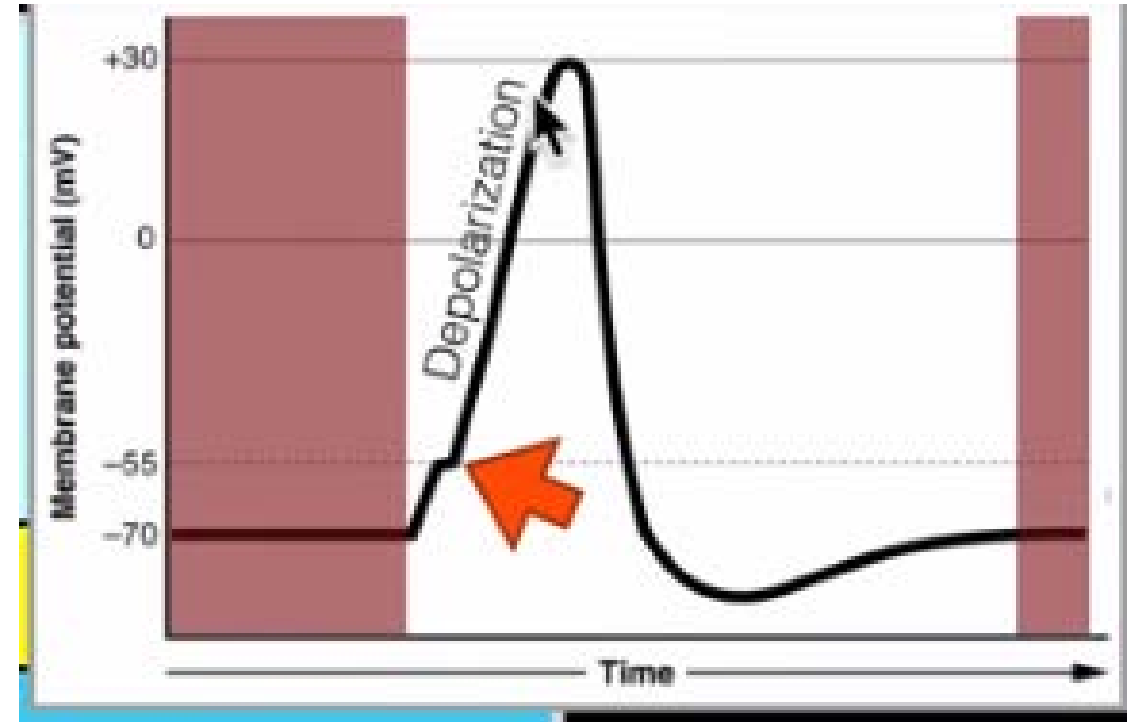
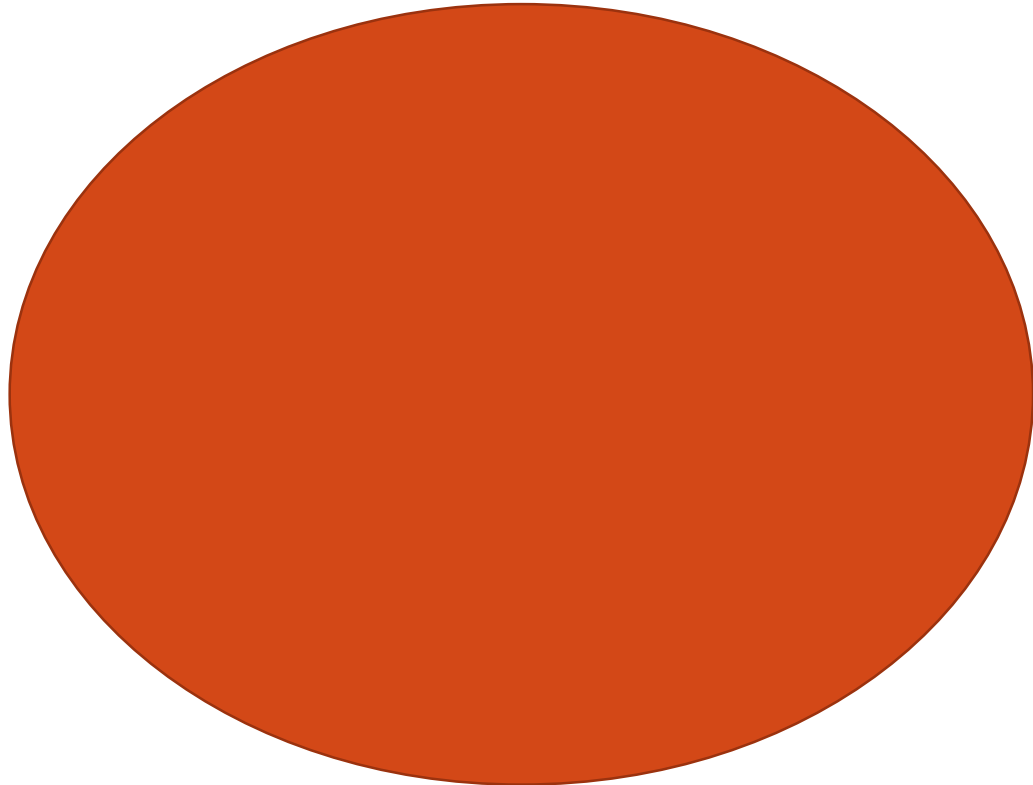




# THE RESTING POTENTIAL: CROSS SECTION OF NEURON.

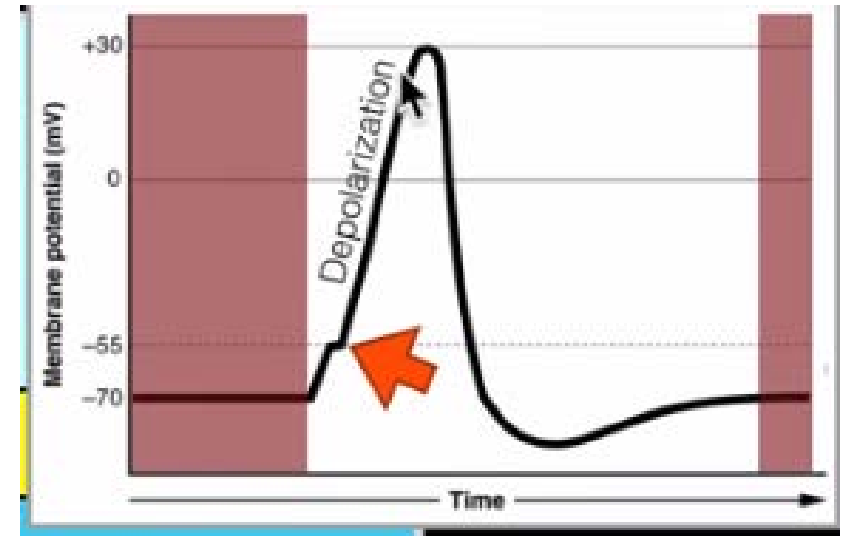
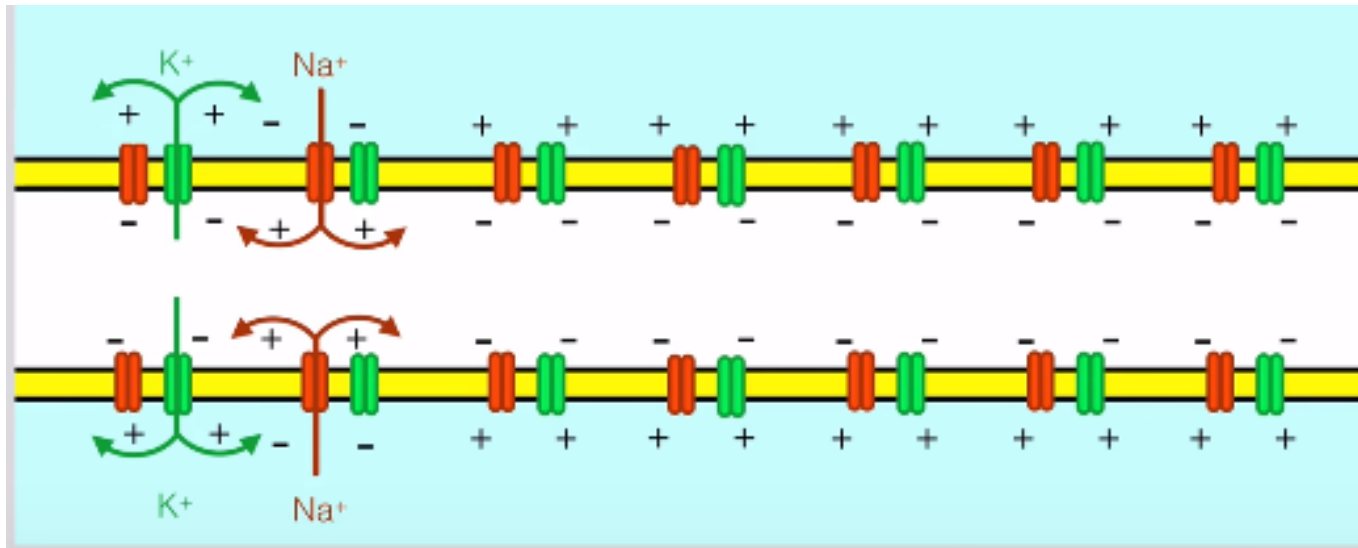


# ACTION POTENTIAL

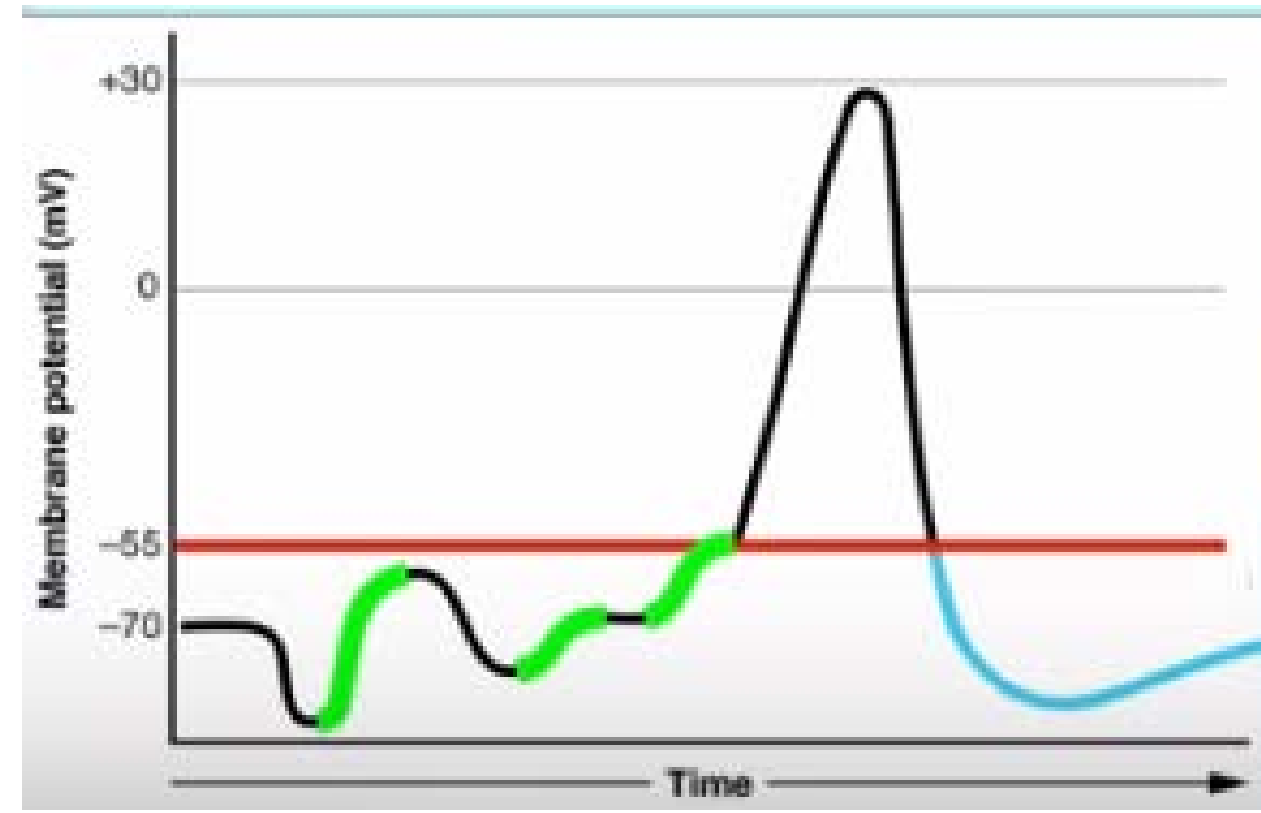
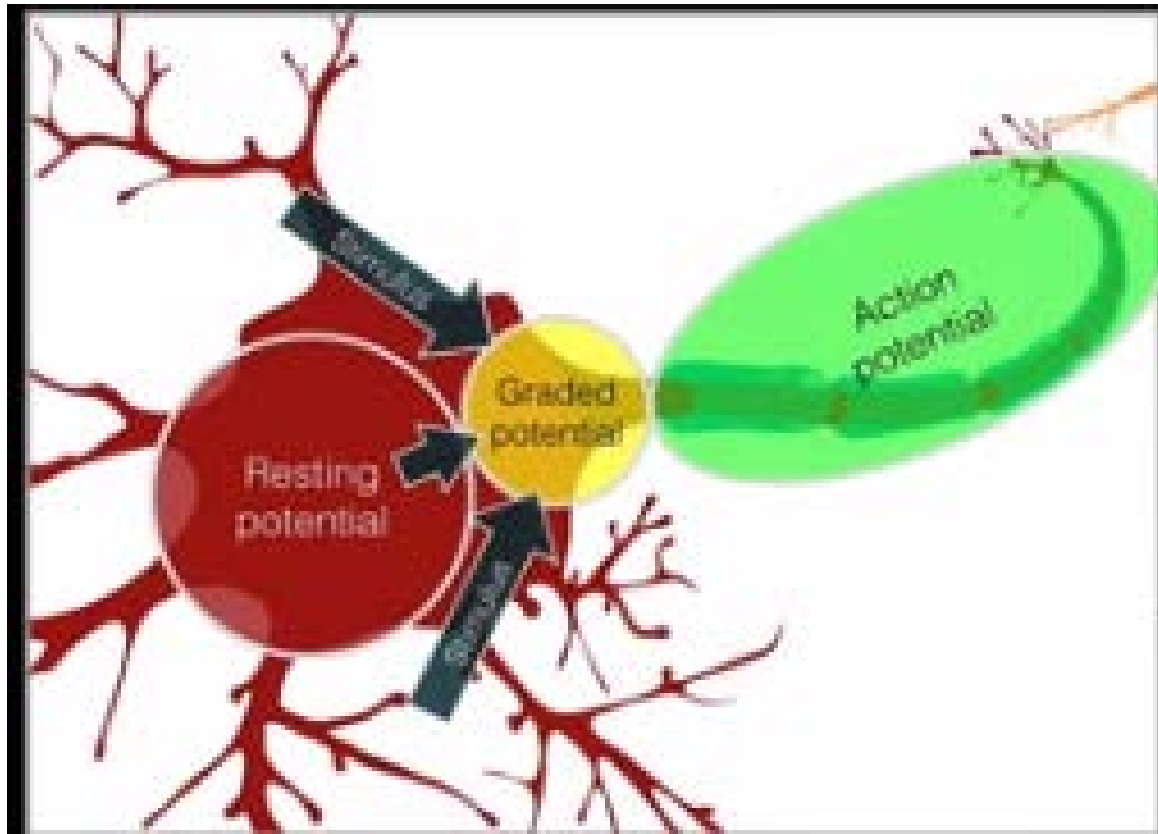




# HOW DOES THE MESSAGE MOVE DOWN THE AXON?



# GRADED POTENTIAL: EXCITABLE OR INHIBITORY MESSAGE FROM OTHER NEURONS



# OVERVIEW

<https://www.youtube.com/watch?v=fHRC8SILcH0>



# LEARNING ACTIVITY

## Nerve Impulse Drawing Assignment

I will post the answer key to the worksheet from last class on my website.

There is also a reading on freshgrade to help you with this assignment.

