



How Your Brain and Your Body Talk (🧠 A Brain Facts Story)
(3rd Grade – 8-9 yrs.)
Physical Activity: Becoming Neurons
Group Activity



STORY CONNECTION – SLIDES 13-14 (Approx Time: 10-15 mins)

When neurons talk to other neurons or other parts of the body, they release a chemical. It is like one neuron spitting out a chemical at another neuron or another part of the body. The other neuron or other part of the body then “catches” the chemical using something called a **receptor**. That is the main way that neurons communicate with other neurons and with other parts of the body. Neurons can also “talk” to other neurons by spitting out electrical charges (positive and negative) to each other. This is faster than spitting out chemicals because the neurons are touching when the electrical charges are getting passed along.

Materials needed:

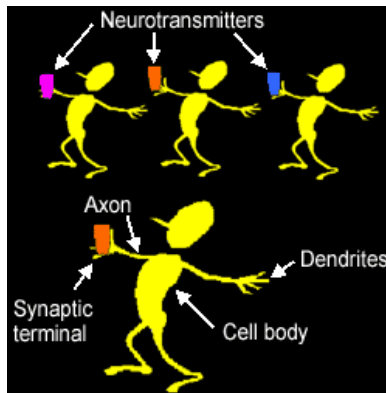
- Small items such as buttons, rocks, erasers, etc.
- Stopwatch, or clock, or timer

Preparation needed:

- Determine which small item will be used.
- Gather enough small items so each student has one
- Secure a space for student(s) to stand in a line or “U” shape
- You can show the figure below of which body parts represent parts of a neuron by either printing it or drawing it (optional).

Instructions:

1. In this activity, student(s) will physically “become” a chain of neurons to demonstrate how messages are passed throughout the body.
2. Have all the student(s) stand and form a line/”U”. Each person should be about arm's length away from the next person.
3. Explain that each student is a neuron.
4. Review the parts of the neuron by identifying which body part represents that neuron part of the activity. As shown in the figure:
 - The left hand is the dendrites of a neuron.
 - The body is the cell body.
 - The right arm is an axon.
 - The right hand is the synaptic terminal.



5. Next, provide each student with a pre-determined small item (button, rock, eraser, etc.).
6. Tell them to put this item in their right hand (synaptic terminal). It represents a neurotransmitter.
7. Explain that when the student(s) hear the word "GO!" they will begin transmitting a signal just like neurons would.
 - The first student in the line will pass their neurotransmitter to the neuron next to them by placing it in the dendrite. Which means, they will place their small object in the left hand of the person next to them.
 - That person will then place their small object (which is in their right hand) in the left hand of the next person and so on. When the last neurotransmitter has been passed and traveled through each neuron, the transmission is complete!
8. Remember that each "neuron" will pass its own transmitter to the next neuron in line. Each neuron HAS ITS OWN neurotransmitter. The neuron may not pass their transmitter on to the next neuron until they have received the message.
9. Ask student(s) if they have any questions or need any clarification. Clear up any misunderstandings.
10. When the leader says "GO," have the person at the beginning of the line start the signal transmission by placing his or her "neurotransmitter" into the hand of the adjacent person until it reaches the last person.
11. Do this a couple of times so student(s) get the hang of it. Then use the stopwatch, clock, or timer to see how long it takes for the message to go from the beginning to the end of the line.
12. Time the student(s) a couple of times to see if they can get faster with practice.
13. You can also measure the distance from the first to the last neuron. Now calculate the speed.

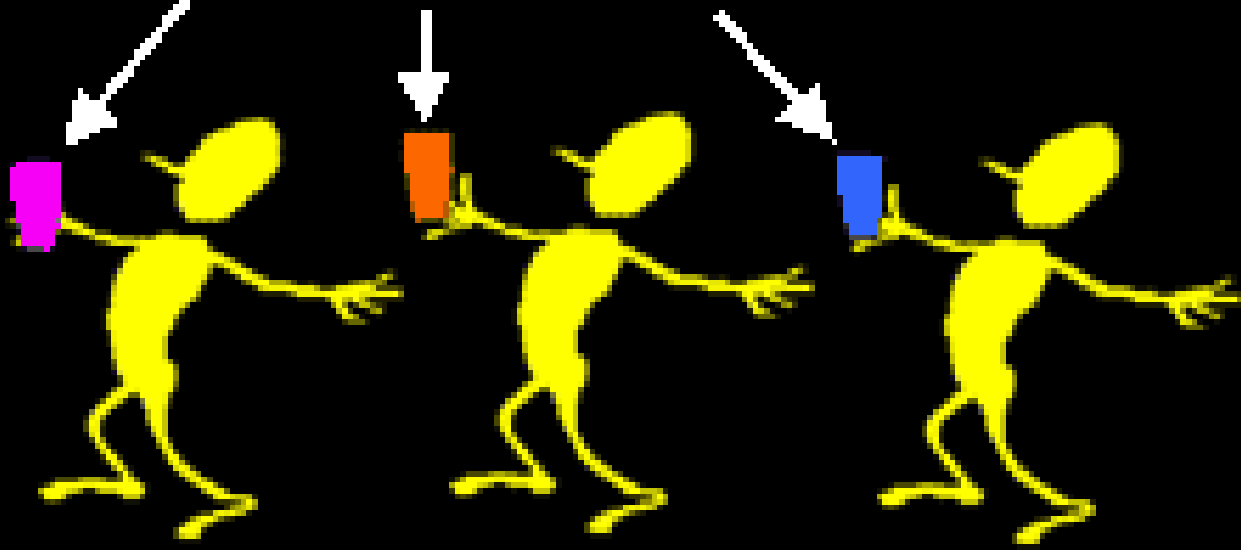
Suggested Questions:

 - How fast did the message travel from first to last neuron?
 - Why do you think the speed of transmission of the model is so slow?
14. To review, ask student(s) the following question and allow them to respond.

What are the parts of a neuron represented by this demonstration?

 - The hand that receives the neurotransmitter is the "dendrite."
 - The middle part of your body is the "soma" or "cell body."
 - The arm that passes the neurotransmitter to the next person is the "axon."
 - The hand that gives the neurotransmitter is the "pre-synaptic terminal". The hand that gets the neurotransmitter in the "post-synaptic terminal".
 - In between the hands of two people is the "synaptic gap".
15. In closing, review the difference between chemical and electrical signals and have student(s) discuss which would be represented by the demonstration. Remind them that it is because of these signals that we can do the things we do. The brain and body talk to each other to let us do all the functions we need to do.

Neurotransmitters



Axon

Dendrites

Synaptic terminal

Cell body

