Inquire & Investigate

Ideas for Supplies

- several friends or classmates
- cotton balls

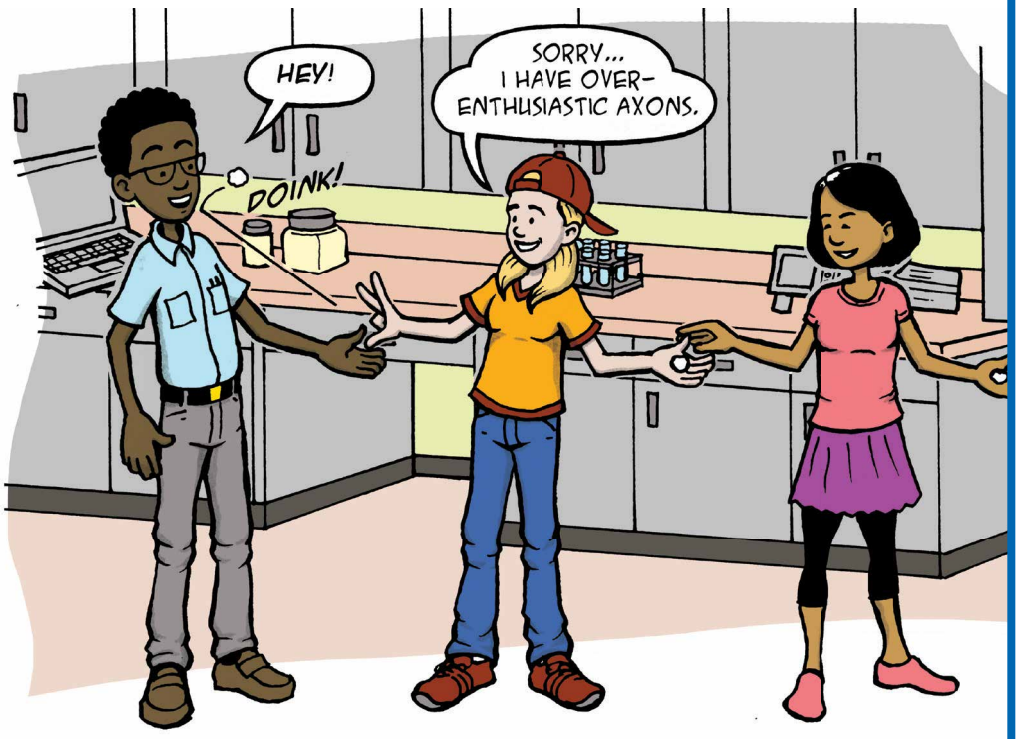
How Neurotransmission Works

Neurotransmission happens constantly in your body to help you do the things you want to do. Watch this video to see how it works.

INQUIRE & INVESTIGATE: SENDING SIGNALS

Neurons send signals by releasing chemical neurotransmitters across a synapse, the space between neurons. The axon terminal releases the neurotransmitter, which moves across the synapse and attaches to receptors on the dendrites of a nearby neuron. This generates an electrical signal that goes to the neuron's cell body. If enough input signals are received, the cell body produces an electrical signal called an action potential, which travels down the axon to an axon terminal. From the axon terminal, neurotransmitters are released.

You can create a model of these signals using a few friends or classmates and some cotton balls.



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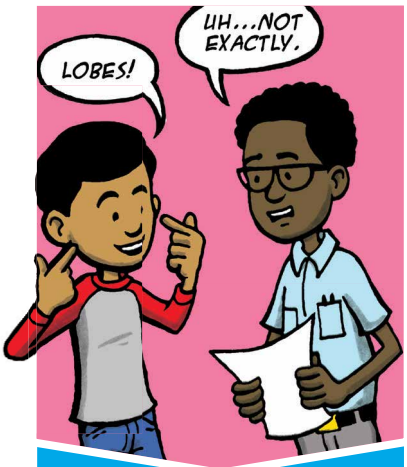
Inquire & Investigate

- **Arrange your volunteers to represent neurons.** Ask them to stretch out their hands on either side, but leave a gap so that the hands do not touch. Designate one hand as dendrites and the other as axons.
- **Give a cotton ball to each volunteer neuron.** The cotton ball can be held in the hand designated as axons.
- **Simulate a sensory input by tapping the first volunteer.** After receiving the sensory input, the neuron fires its neurotransmitter (cotton ball) from its axon terminal to the next neuron, which receives the signal with its dendrites. How does the signal move from neuron to neuron?
- **What happens when the signal reaches the final volunteer, who represents a muscle?** What should the volunteer do to show that the message was received?
- **design a neural signal that requires more than one neurotransmitter to fire.** How does it work? What do your volunteers need to do?

To investigate more, incorporate the idea of excitatory and inhibitory neurons. Replace one of the cotton balls with a colored cotton ball or other small item. Tell the volunteers that if they received the colored ball in their dendrite hand, they may not pass it along to the next neuron. Try to send a message. What happens? Why would a neuron want to stop further signaling? Try repeating the activity but this time have the colored ball reduce the cell body's number of inputs by one as it tries to reach the threshold for firing.

VOCAB LAB

Vocab Lab: Write down what you think each word means: **cerebrum, cerebellum, brain stem, hemisphere, lobes, axon potential, neurons, neurotransmitters, dendrites,** and **meninges**.

Discuss you definitions with friends using real life examples. Did you all come up with the same definitions? Turn to the text and the glossary if you need help.