

Unit 1: Reaction Time



*“We really like the fact that Brain Explorers involves an element of drama, that music is incorporated. It levels the playing field for my kids and gives everybody a chance.”
4th grade teacher.*

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GRADE

Reaction Time Unit: Background Information

Galileo deduced that bodies falling freely in a vertical direction have uniform acceleration, and in the absence of air resistance, all bodies fall with the same constant acceleration regardless of their mass. Reaction times can be calculated manually, but because they can occur in milliseconds, it is easier to use a mathematical formula developed by scientists to calculate reaction times based on the distance that an object is dropped before it is caught. The reaction times can be measured in this manner because an object falls at a predetermined rate.

The neural pathway involved in the reaction time experiment involves a series of neural processes. Catching the ruler begins with the eye watching the ruler in anticipation of it falling. After the ruler is dropped, the eye sends a message to the visual cortex, which perceives that the ruler has fallen. The visual cortex sends a message to the motor cortex to initiate catching the ruler. The motor cortex sends a message to the spinal cord, which then sends a message to the muscle in the hand/fingers. The final process is the contraction of the muscles as the hand grasps the ruler. All of these processes involve individual neurons that transmit electrochemical messages to other neurons. The details of neurotransmission will be discussed in later lessons. When comparing hands, students will usually find that their dominant hand is faster. The

increased speed is evidence that one hand has greater dexterity than the other. Or, simply put, one hand is more skilled. Because the dominant hand is used more often, the neurons that carry messages between that hand and the brain are faster at their job. They are communicating along well-worn pathways. By running the same messages along the same pathway repeatedly, students can improve their motor skills. The phrase "practice makes perfect" is scientifically accurate! Go ahead and encourage your students to practice skills they wish to hone.

