

## GLOSSARY

**Adrenaline** – A hormone secreted by the adrenal glands that the brain uses in emergency situations to suppress some bodily functions and enhance others, increasing the body's reaction time and strength.

**Axon** – A nerve fiber and the tube-like part of a neuron that relays information from the cell body toward the synapse and the dendrites of another neuron.

**Blood-Brain Barrier** – A biological filtration system that keeps many harmful things from entering the brain through the bloodstream.

**Cell Body** – The central portion of a neuron which contains the cell's nucleus.

**Dendrites** – The branch-like portions of a neuron that hold the receptors to receive messages (nerve impulses) from other neurons.

**Neurons** – Specialized cells that make up the brain, each consisting of a cell body, a nerve fiber called an axon that transmits nerve impulses to other neurons and dendrites which receive nerve impulses from other neurons.

**Neurotransmitters** – Chemicals the brain uses to transmit messages between neurons and to control the body.

**Receptors** – The sites on the dendrites of neurons that receive neurotransmitters.

**Synapse** – The tiny gap neurotransmitters must cross between the axon of one neuron and the dendrites of another.

May be reproduced for use in the classroom.

For a complete list of Educational programs,  
please visit our website at [www.tmwmedia.com](http://www.tmwmedia.com)



**TMW MEDIA GROUP, INC.**

2321 Abbot Kinney Blvd., Venice, CA 90291

(310) 577-8581 Fax (310) 574-0886

Email: [sale@tmwmedia.com](mailto:sale@tmwmedia.com)

Web: [www.tmwmedia.com](http://www.tmwmedia.com)

Producers & Distributors of Quality Educational Media

© 2012 Allegro Productions, Inc. and  
**TMW MEDIA GROUP, INC.**

# Show Me Science

## The Wonders of Physiology

# The Brain – the First Computer

**K4582DVD**

***Advanced Teachers Guide***

**SYNOPSIS:**

The human brain is often compared to a computer. Both receive input, process information and produce output. However the three-pound organ inside your head is far more complex, powerful and capable than even the most advanced computer.

This program makes the comparison to show students what is known - and what researchers have yet to discover – about how our brains process and store information. Students will learn how the brain uses chemical messengers to control the body and some ways scientists are learning more about our amazing brains!

**CURRICULUM UNITS:**

- Biology
- Chemistry
- Health
- Human Development
- Life Science
- Physiology
- Psychology

**CAREER OPPORTUNITIES:**

- Biologist
- Medical Doctor
- Neurologist
- Neuroscientist
- Neurosurgeon
- Pharmacologist
- Radiologist
- Psychiatrist

**PROGRAM OVERVIEW:**

This program begins by explaining that our brains control all our other organs and bodily functions and are the centers of all of our thoughts and ideas, memories, dreams and feelings – our minds. Students learn that the brain is made up of 100-200 billion specialized cells call neurons. Each neuron consists of branch-like dendrites with receptors to receive messages from other neurons, a cell body and a tube-shaped axon to relay messages from the cell body to other neurons.

The axon of one neuron is separated from the dendrites of another neuron by a tiny gap called a synapse. Researchers have begun mapping which areas of the brain receive stimuli from each of the various senses or control different emotions or bodily functions. Some scientists are now studying differences that have been found between the brains of males and females.

**ISSUES & CRITICAL THINKING:**

- 1) After showing the program, ask the class the following:
  - a) On average, how many cells make up the human brain?
  - b) What is a brain cell called and what are its parts?
  - c) What is the name for chemicals that send messages to nerves?
  - d) What protects the brain from many harmful substances that could enter it through the bloodstream?
  - e) How does adrenaline help us react faster in dangerous situations?
- 2) Discuss the human nervous system and its components.
- 3) Sketch on the board a sequence of neurons with the following cell parts (from left to right): dendrites, cell body, axon, synapse, dendrites, cell body etc. Ask students to do the following:
  - a) Sketch a nucleus in each cell body.
  - b) Label the dendrites, cell bodies, axons, synapses.