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ABOUT THE AUTHOR

Ann Edson, M.Ed., former elementary school principal, teacher and adjunct professor in education at Adelphi University, is a National Education Consultant. She has authored many programs in mathematics and science including CELLS, CRACK and SMOKING’S NOT FOR WINNERS.
THIS PROGRAM CONTAINS

1- Video
1- Teacher’s Guide

INTENDED AUDIENCE

Grades 4-8

COURSE SUITABILITY

Appropriate for all science and health courses in which the human body systems are covered.

RATIONALE

The study of the human body is an integral part of science and health in the elementary grades. The video promotes healthful eating, exercise, and not smoking to keep the human body functioning at its best. Combining a process/hands-on approach with this interactive video allows students to extend their knowledge of the HUMAN BODY SYSTEMS.

OVERVIEW

Introduces the student to the inner workings of the marvelous nervous system. Explores the central nervous system to the peripheral nervous system. Animated graphics holds the students attention while showing nerves sending and receiving messages. Students will learn parts and functions of the brain and spinal cord plus neurons, dendrites, and axons. Interactive activities during the video reinforce the concepts.

PERFORMANCE OBJECTIVES

After viewing and interacting with this program students will be able to:

• State the two central parts of the nervous system.
• Name the gap that impulses must cross over.
• Know the two main divisions of the nervous system.
• Point out the three sections of the brain.
• Understand that the brain and spinal cord regulate voluntary and involuntary actions.
CLASSROOM TEACHING STRATEGIES

This is an interactive program. Have students prepared to watch this program with a pencil and a sheet of paper. Students should be ready to answer questions during the playing of this video. Each question has a period of ten seconds to answer.

OTHER PROGRAMS IN THE HUMAN BODY SYSTEMS SERIES

Digestive system
Respiratory system
Circulatory system
Muscular system
Skeletal system

CREDITS

Produced By ............................................... Richard Harris
Videotape Editor ................................. Renee Green/Joe Haegele
Recorded By .................................................. Rich Lepage
Narrator .................................................. Rick Adamson
Computer Art .............................. Harry Carlisle/Kati Sontag/Al Levy
Written By ................................................ Ann Edson M. ED.

SPECIAL THANKS TO

American Heart Association
Texas Heart Institute
Sears Video Network
New York City Convention & Visitors Bureau
Mr. Wizard Studio
IBM, Inc.
American Red Cross
University of Texas
PRE-VIEWING ACTIVITIES

1) Have students familiarize themselves with the words in the word list, either by class discussions or by looking up the definitions.

2) Have the students write a short essay on the nervous system. Guide a discussion summarizing the main ideas from the essays.

POST-VIEWING ACTIVITIES

1) Have the students evaluate all their suggestions on how they would describe the nervous system and let the class prepare a final listing of the characteristics of the nervous systems taught in the video.

2) Have students write an essay using the list of characteristics from activity one.

3) Have the students complete the activity sheets and crossword puzzle.

4) Administer the program exam
BIBLIOGRAPHY


Nervous System

WORD LIST

Axon

Brain

Cerebellum

Cerebrum

Circulating

Dendrite

Digestion

Eardrum

Impulse

Inner ear

Involuntary

Medulla
Nervous System

WORD LIST (Cont’d)

Nerve cell

Nerves

Neurons

Organ

Regenerate

Reflex action

Reflex arc

Spinal cord

Stimulus

Synapse

Taste bud

Voluntary

Name _______________________ Class  _______________ Date  ________________
Nervous System

GLOSSARY

Axon - The long extension of a nerve cell that carries impulses away from the body of the cell.

Brain - The soft, grayish and whitish mass of nerve cells and nerve fibers enclosed in the skull. The brain is the organ of consciousness and furnishes outgoing stimulation of muscles as a response to incoming sensory stimulation.

Cerebellum - The part of the brain that controls the coordination of the muscles.

Cerebrum - The part of the human brain that controls thought and voluntary muscular movement.

Circulating - To flow with a continuous motion through vessels or tissues in the body of an organism.

Dendrite - Any of the short, branching extensions of a nerve cell that receive stimuli from other cells.

Digestion - The process by which food is broken down into small molecules.

Eardrum - A thin membrane across the middle ear that vibrates when sound waves strike it.

Impulse - An electrochemical charge transmitted along a nerve cell, causing excitation of muscle, gland and other nerve cells that it reaches.

Inner ear - The innermost part of the ear. Containing the essential organs of hearing and equilibrium. The inner ear is filled with fluids and it is here that sound vibrations are converted to nervous impulses.

Involuntary - Not controlled by will; Under the control of some mechanism operating independently of the cerebral cortex.

Medulla - The part of the brain that controls breathing and other involuntary functions.
GLOSSARY (Cont’d)

Nerve cell - Also called a neuron. The basic unit of the nervous system. Includes 3 basic parts - the cell body, axon and dendrites.

Nerves - A fiber or bundle of fibers made up of neurons through which impulses pass through parts of the human body.

Neurons - See nerve cell.

Organ - Any part of the human body that is composed of various tissues organized to perform some particular function.

Regenerate - To grow again or form, to replace that which has been lost or injured: blood vessels regenerate very quickly.

Reflex action - An involuntary action in direct response to a stimulation of some nerve cells.

Reflex arc - The nerve path in the body leading from stimulus to reflex action.

Spinal cord - The whitish cord of nerve tissue which extends from the medulla down through most of the spinal column from which nerves to various parts of the body branch off.

Stimulus - Something that excites the body or some part of the body (as an organ, tissue, or cell) to produce a specific response.

Synapse - The place where a nerve impulse passes from one cell to another.

Taste bud - One of the groups of receptor cells, chiefly in the lining of the tongue or mouth, that are organs of taste: In the tongue taste buds located in different regions conduct specific taste sensations.

Voluntary - Arising from free will, acting on one’s own initiative.
1) Your ____________________________ controls every bodily function.
   A) brain   B) spine   C) nervous system   D) neuron

2) Your body contains about a hundred billion nerve cells called
   ____________________________.
   A) red blood cells   B) dendrites   C) synapse   D) neurons

3) Impulses can travel through your nervous system at speeds up to
   ____________________________ miles per hour.
   A) 65   B) 235   C) 105   D) 265

4) The brain, along with the spinal cord, regulates many bodily functions such as
   breathing, digestion, and the beating of your heart. These processes are called
   ____________________________ actions.
   A) voluntary   B) intentional   C) spontaneous   D) involuntary

5) The brain and spinal cord also coordinate most ____________________________
   movements such as closing your hand, wiggling your toes, or bending your leg.
   A) voluntary   B) intentional   C) spontaneous   D) involuntary

6) The nervous system has two main divisions. The first, called the
   ____________________________ nervous system, consist of the brain and
   spinal cord.
   A) perplex   B) peripheral   C) central   D) northern

7) The second is called the ____________________________ nervous system, it is
   the pathway to your brain for your five senses.
   A) perplex   B) peripheral   C) central   D) northern

Name _______________________   Class  _______________   Date  ________________
Nervous System

Activity Sheet #2

Label the Nerve Cell

NEURON WORD BOX

Dendrite
Axon
Synapse
Dendrite
Axon
Nervous System

NERVOUS SYSTEM

WORD BOX

Skull
Spinal Cord
Cerebrum
Cerebellum
Medulla
Spinal Column
1) Your brain has three parts: The cerebrum, the cerebellum, and the membrane.

   True          False

2) The two halves of the brain are called hemispheres.

   True          False

3) Nerve cells, or neurons, in the brain and spinal cord can not grow back, or regenerate once injured.

   True          False

4) The tongue is the sensory organ for taste.

   True          False

5) If your sense of smell is not working, you will not be able to taste the food you eat.

   True          False

6) Information received from the sense is processed in different parts of the spine. All areas of the spine are connected by nerve fibers.

   True          False
Select the word from the word box that best completes the statement or question.

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<thead>
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<tr>
<td>Right</td>
</tr>
<tr>
<td>Cerebellum</td>
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<tr>
<td>Cord</td>
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1) Neurons have projections attached which can send messages to other neurons. These projections are something like electrical wires. The area where the messages move from one nerve cell to another is called the __________________.

2) __________________carry the messages known as impulses, into the cell body.

3) Your brain has three parts: the ________________, the ________________, and the _________________.

4) The ________________ hemisphere generally controls our creativity.

5) The ________________ hemisphere controls our logical, step-by-step thinking.

6) Your ________________ is a cable of neurons running from your medulla down the center of your back.

7) Impulses from outside your body are picked up first by your ________________ organs.

8) Sound waves enter through your outer ear and travel through the ear canal to your _________________.

Name _______________________ Class  _______________ Date  ________________
**Nervous System**

**Activity #1**

1) A
2) D
3) D
4) D
5) A
6) C
7) B

**Activity #2**

1) Axon
2) Axon
3) Dendrite
4) Dendrite
5) Synapse

**Activity #3**

1) Cerebrum
2) Cerebellum
3) Medulla
4) Skull
5) Spinal Cord
6) Spinal Column

**Activity #4**

1) F
2) T
3) T
4) T
5) T
6) F

**Program Examination**

1) Synapse
2) Dendrites
3) Cerebrum, Cerebellum, Medulla
4) Right
5) Left
6) Spinal Cord
7) Sensory
8) Eardrum