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ABSTRACT

GRADES OR AGES: Twelfth grade. SUBJECT MATTER: The human body processes in normal and in certain abnormal conditions. ORGANIZATION AND PHYSICAL APPEARANCE: The document contains a preface, a list of goals, a list of specific block objectives, a bibliography, a course outline for each of the six blocks, and a quinmester posttest. The six blocks are as follows: a) The Body as a Whole; Structural and Functional Relationships and Organization; b) The Skeleton; c) Joints or Articulation; d) Muscles; e) The Brain, Spinal Cord, and Nerves; and f) The Sensory System. OBJECTIVES AND ACTIVITIES: Objectives are expressed in the list of general goals, the list of specific course objectives, and the outline. INSTRUCTIONAL MATERIALS: A bibliography includes basic and supplementary references, periodicals, and films. STUDENT ASSESSMENT: No provision is indicated. OPTIONS: The course is required. (Related document is SP 007 539.) (JA)

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D A D E C O U N T Y P U B L I C S C H O O L S  
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Course Outline

COOPERATIVE HEALTH OCCUPATION EDUCATION - 8009  
(Body Structure and Function I)

Department 48 - Course 8009.08

Sp 007 537

the division of

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## PREFACE

The primary aim of this course outline is to introduce the learner to principles of the biological and physical sciences that contribute to his understanding of human body processes in normal and in certain abnormal conditions. The sciences of body structure (anatomy), dynamics and function (physiology), and disease (pathology) will not be covered in depth due to the limited experience of the learner and the hours allotted to present the course.

This course is designed to provide the learner with basic knowledge and understanding of the normal functional relationships of the body so that he may have a better understanding and appreciation of himself as a contributor and participant on the health team in his role as an auxiliary health assistant.

This course will be one of four quins required throughout the school year for the twelfth grade student participating in the Cooperative Health Occupations Program. In addition to the classroom instruction, the learner will receive on-the-job training in a health occupation.

The material for this quinmester course contains six blocks and covers a period of 45 classroom hours, or one nine-week quinmester. Students attend one class period per day, five days a week.

The teacher-coordinator may present the material through his own lectures as well as through the use of guest speakers. Because of the nature of the course, it is suggested that a registered nurse would be able to better relate the learner to the aspect of illness. Many of the local and national organizations that have special interests concerning the health of certain of the body systems, offer freely their time, films,

printed handouts and literature to enhance the student's interest in facing problems of disease in the human body. Round-table discussions, charts, visual aids, demonstrations and field trips are all used effectively in presenting this quinmester course.

The bibliography in this outline lists the sources where selections may be found to fit the individual teacher's lesson plans.

This outline was developed through the cooperative efforts of the instructional and supervisory personnel, the quinmester advisory committee, and the Vocational Teacher Education Service and has been approved by the Dade County Vocational Curriculum Committee.

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with Suggested Hourly Breakdown

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## GOALS

The student must be able to:

1. Demonstrate an understanding of the basic structure and function of the human body.
2. Develop an appreciation of the interrelation of the various systems of the human body.
3. Understand the normal functions of the body as a basis for developing competency as an auxiliary health assistant.
4. Apply the knowledge gained about the musculo-skeletal system by using good body mechanics at all times.
5. Exhibit the ability to relate the functions of organs of special senses to other parts of the body.
6. Determine the factors involved in order to safely reproduce a child.
7. Accept the difference in rates and in status of growth and development evident between himself and others.
8. Describe the influence of endocrine secretions on growth and development.
9. Understand that malfunctioning of the organism may be characterized by physical effects, emotional reactions, and social concerns.
10. Name various methods by which disease can be prevented, controlled, or cured.
11. Compare and contrast the structure and function of the male and female reproductive systems.

## SPECIFIC BLOCK OBJECTIVES

### BLOCK I - THE BODY AS A WHOLE: STRUCTURAL AND FUNCTIONAL RELATIONSHIPS AND ORGANIZATION

The student must be able to:

1. Define a cell. Name four main components of a typical cell.
2. Draw a rough sketch of the two principal groups of body cavities, indicating the nine divisions of the largest cavity.
3. Construct a schematic diagram of a human body, properly placing 75% of the listed organs.

a. Heart	e. Uterus	i. Large intestine
b. Lungs	f. Vertebral column	j. Bladder
c. Stomach	g. Liver	k. Kidney (2)
d. Brain	h. Small intestine	
4. Identify in writing, four types of body tissue and relate how they are organized to form organs.
5. Stand in the anatomical position and verbally state the location of the planes of the body.
6. List in writing the opposite term for each of the following body directions: superior, ventral, anterior, cranial, medial, and proximal. Define each item in the complete list.

### BLOCK II - THE SKELETON

The student must be able to:

1. State a general description of a long bone with respect to its tissues, membranes, and vessels.
2. Name and describe three bone diseases and five types of fractures.

### BLOCK III - JOINTS OR ARTICULATIONS

The student must be able to:

1. Classify in writing three types of joints. Give an example of each.
2. Describe joint structure with respect to cartilage, ligaments, muscles, and tendons.
3. Stand in the anatomical position and demonstrate the following movements: flexion, extension, abduction, adduction, and rotation.
4. List in writing the symptoms and names of two common articulation disorders.

### BLOCK IV - MUSCLES

The student must be able to:

1. Identify from pictures and compare verbally the three types of muscle tissue in relation to their location, function, and structural differences.

2. Apply knowledge of physiology of contraction by making a schematic drawing illustrating the response of the biceps muscle to stimuli from the nervous system.
3. List the main muscles of the abdominal wall and give the reason for their especially light and strong construction.
4. Use his knowledge of cell activity to explain verbally how we have muscle fatigue with strenuous exercise.
5. Describe briefly: bursitis, flatfoot (include some causes in both cases).

#### BLOCK V - THE BRAIN, SPINAL CORD, AND NERVES

The student must be able to:

1. Use his knowledge of the nervous system to trace the pathway of a nerve impulse from the finger tip as it touches a needle point, to the removal of the fingertip from the needle point.
2. Locate and label on a drawing of the brain the five main parts: cerebrum, midbrain, pons, medulla, cerebellum. Briefly describe the main functions of each.
3. List the divisions of the nervous system, stating the components of each.

#### BLOCK VI - THE SENSORY SYSTEM

The student must be able to:

1. Give verbally a general definition of a sense and name seven of the senses.
2. Name the main parts of the eye and trace the path of a light ray from outside of the eye to the brain. Show the action of eye muscles.
3. Draw the main parts of the ear and describe the process that ensues from the time that a sound wave activates the eardrum to the registration of the sound in the brain.
4. Define the difference between a general and a special sense.

Course Outline

COOPERATIVE HEALTH OCCUPATION EDUCATION - 8009  
(Body Structure and Function I)

Department 48 - Course 8009.08

I. THE BODY AS A WHOLE: STRUCTURAL AND FUNCTIONAL RELATIONSHIPS AND ORGANIZATION

A. General Plan of the Human Body

1. Living matter and cells:

- a. Basic substance - protoplasm
- b. Structural unit - cell:

- (1) Characteristics of diffusion, osmosis, filtration, mitosis
- (2) Organization of body cells:
  - (a) Tissues - epithelium, connective, nerve, muscle
  - (b) Membranes - mucous, serous, fascial, skeletal
- (3) Tumors:
  - (a) Malignant
  - (b) Benign

2. Organs and organ systems:

- a. Skeletal
- b. Muscular
- c. Circulatory
- d. Digestive
- e. Respiratory
- f. Integumentary
- g. Urinary
- h. Nervous (and sensory)
- i. Endocrine
- j. Reproductive

B. The Anatomical Position and Body Regions

1. Directions and locations in the body:

- a. Locations:
  - (1) Superior - inferior
  - (2) Ventral - dorsal
  - (3) Cranial - caudal
  - (4) Medial - lateral
  - (5) Proximal - distal

b. Planes:

- (1) Midsagittal
- (2) Frontal
- (3) Transverse

2. Body cavities:

a. Dorsal:

- (1) Cranial
- (2) Spinal

Ventral:

- (1) Thoracic
- (2) Abdominal
- (3) Pelvic

## II. THE SKELETON

- A. Medical Terminology
- B. Bones
  - 1. Classification
  - 2. Specific bones:
    - a. Head
    - b. Trunk
    - c. Extremities
  - 3. Landmarks of bones:
    - a. Prominences
    - b. Pelvic divisions
    - c. Fontanelles
    - d. Foramina
    - e. Fossae and grooves
  - 4. Disorders of bones

## III. JOINTS OR ARTICULATIONS

- A. Medical Terminology
- B. Classifications
  - 1. Slightly movable
  - 2. Freely movable
  - 3. Immovable
- C. Structure
  - 1. Ligaments
  - 2. Cartilage
  - 3. Synovial fluid
- D. Movements:
  - 1. Flexion
  - 2. Extension
  - 3. Abduction
  - 4. Adduction
  - 5. Rotation
- E. Disorders of Joints

## IV. MUSCLES

- A. Medical Terminology
- B. Characteristics of Muscular Tissue
- C. Types of Muscle Tissue
- D. Physiology of Contraction
  - 1. Tone
  - 2. Conditions of contraction

#### IV. MUSCLES (Contd.)

3. Response to stimuli
4. Types of contraction
5. Levers

#### E. Fatigue and Exercise

#### F. Individual Muscles, Their Origin, Insertion and Function

1. Head
2. Neck
3. Upper extremities
4. Chest and back
5. Abdomen
6. Lower extremities

#### G. Disorders of the Muscles

#### V. THE BRAIN, SPINAL CORD, AND NERVES

##### A. Medical Terminology

##### B. Nervous System as a Whole

1. Neurons
2. Synapse
3. End organs
4. Reflex arc

##### C. Divisions

1. Central nervous system:
  - a. Brain
  - b. Spinal cord
2. Peripheral nervous system:
  - a. Cranial nerves
  - b. Spinal nerves
3. Autonomic nervous system:
  - a. Sympathetic nervous system
  - b. Parasympathetic nervous system

#### VI. THE SENSORY SYSTEM

##### A. Medical Terminology

##### B. Senses:

1. Pressure
2. Temperature
3. Touch
4. Pain
5. Position

## VI. THE SENSORY SYSTEM (Contd.)

- C. The Eye
  - 1. Parts and purposes
  - 2. Disorders
  
- D. The Ear
  - 1. Parts and purposes
  - 2. Disorders
  
- E. Other Special Organs of Sense
  - 1. Taste
  - 2. Smell
  - 3. Hunger and appetite
  - 4. Thirst

## VII. QUINMESTER POST TEST

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(Body Structure and Function I)

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3. Beyond the Shadows. 16 mm. 26 min. Color. Sound. Florida  
State Board of Health. #429.
4. Body Defenses Against Disease. 16 mm. 10 min. B/W. Sound.  
Florida State Board of Health. #113.
5. Care of the Feet. 16 mm. 10 min. B/W. Sound. Florida State  
Board of Health. #116.
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7. Epidemiology of Staphylococcal Infection. 16 mm. 13 min. Color.  
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15. Human Brain, The. 16 mm. 11 min. B/W. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-03060.
16. Immunization. 16 mm. 10 min. B/W. Sound. Florida State Board of Health. #176.
17. Microorganisms: Beneficial Activities. 16 mm. 14 min. Color. Sound. Florida State Board of Health. #646.
18. Microorganisms: Harmful Activities. 16 mm. 16 min. Color. Sound. Florida State Board of Health. #647.
19. Nine Basic Functional Systems of the Human Body. 16 mm. 11 min. B/W. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-05535.
20. Nose, Throat and Eyes. 16 mm. 10 min. B/W. Sound. Florida State Board of Health. #206.
21. Senses of Man, The. 16 mm. 20 min. Color. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-13713.
22. Spinal Column, The. 16 mm. 11 min. B/W. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-03059.
23. You - Living Machine. 16 mm. 10 min. Color. Sound. Florida State Board of Health. #267.

A P P E N D I X

Quinmester Post Test Sample

Quinmester Post Test

Name \_\_\_\_\_ Date \_\_\_\_\_ Score \_\_\_\_\_

I. Short Answer - Answer the following questions by a single word, phrase or choice of words as indicated in the parentheses. Read the complete statement carefully before answering.

1. Anatomy is the branch of biology which studies the form and \_\_\_\_\_ of living things.
2. Physiology is the branch of biology which studies the \_\_\_\_\_ of living things.
3. All living things - man, cells, bacteria - are composed of the "living stuff" we call \_\_\_\_\_.
4. Each cerebral hemisphere of the brain has four main subdivisions or lobes. They are: (any order)
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
5. The reflex center for circulatory and respiratory impulses is located in the \_\_\_\_\_.
6. Voluntary actions - movement of skeletal muscles - are regulated by the central nervous and the (a) \_\_\_\_\_ nervous system. Involuntary actions and cardiac muscles are regulated by the (b) \_\_\_\_\_.

II. Multiple Choice - Each statement needs a word or phrase to make it correct. Only one of the choices listed is correct. Place a circle around the letter of the choice you make. Read all statements carefully.

1. How many chromosomes are there in every human cell:
  - a. 23
  - b. 46
  - c. 92
2. A dense connective tissue that attaches a bone to another bone is a:
  - a. Tendon
  - b. Ligament
  - c. Cargilage

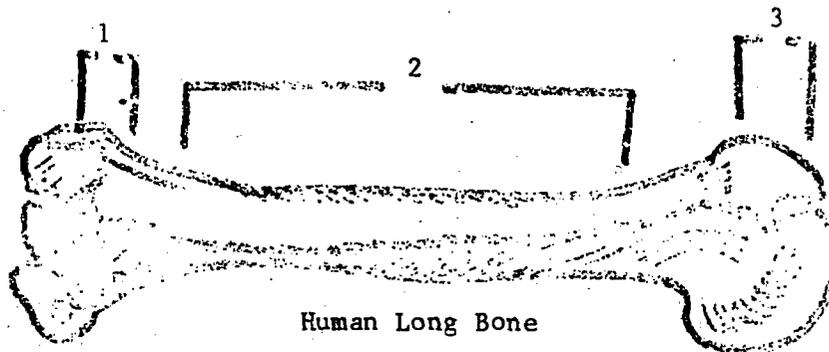
3. Flexion of the arm results principally from the contraction of the biceps muscle. During flexion, the triceps extends and opposes the action of the biceps. In this example, the prime mover is:
  - a. The biceps
  - b. The triceps
  - c. The pectorales major
4. The function of the sympathetic division is:
  - a. To alert and increase the body defenses
  - b. To conserve and restore the body's resources
  - c. To provide sympathy
5. The brain receives support and protection from cerebrospinal fluid and the following three membranes:
  - a. Gray matter
  - b. Cranial nerves
  - c. Meninges

III. Label correctly the numbered parts of the following drawings as indicated:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_



External Eye



Human Long Bone

IV. Matching - The words and phrases in the right hand column are significant in connection with an expression in the left hand column. Match them properly by placing the figure preceding the item in the right hand column in the brackets at the left of the matching item.

- |  |   |
|--|---|
| ( ) 1. Ceruminous glands                   | a. First portion of the small intestine |
| ( ) 2. Vertebral discs                     | b. Pallor                               |
| ( ) 3. Sebaceous glands                    | c. Stroke                               |
| ( ) 4. Duodenum                            | d. Lubricate the skin                   |
| ( ) 5. Break in a bone                     | e. Hair, nails                          |
| ( ) 6. Bringing the arm toward the midline | f. Cartilage "shock-absorbers"          |
| ( ) 7. Lower part of the body paralyzed    | g. Paraplegia                           |
| ( ) 8. Accessory skin structures           | h. Hemiplegia                           |
| ( ) 9. Color less than normal              | i. Produce ear wax                      |
| ( ) 10. Cerebrovascular accident           | j. Fracture                             |
|  | k. Adduction                            |
|  | l. Abduction                            |

ANSWER KEY TO QUINMESTER POST TEST

I. Short Answer

1. Structure
2. Life functions (functions)
3. Protoplasm
4. a. Parietal  
b. Frontal  
c. Temporal  
d. Occipital
5. Medulla oblongata
6. a. Peripheral  
b. ANS or autonomic nervous system

IV. Matching

1. i
2. f
3. d
4. a
5. j
6. k
7. g
8. e
9. b
10. c

II. Multiple Choice

1. b
2. b
3. a
4. a
5. c

III. 1. Epiphysis (extremity)

2. Shaft or diaphysis
3. Epiphysis (extremity)
4. Upper eyelid
5. Pupil
6. Iris
7. Sclera
8. Lower eyelid
9. Lashes