

## Adventure Brochure of a Human Body System

You have been hired as a travel consultant to design an adventure tour through one of the Human Body Systems. Before you can collect your fee from the Anatomy Travel Bureau, you must produce a brochure. The owner of the travel bureau, Mrs. Seymore Sphincter, has informed you that in order to be paid 65 points, **you must highlight the following in the brochure:**

- Main attractions (rides, excursions, activities...Spinal Freefall: On this ride, a roller coaster will drop from the very top of the spinal cord to the very end of it. It will travel about 65 mph.)
- Trendy spots (Left Ventricle of the Heart: Strongest heart contraction really “pumps you up”!)
- Diagrams of organs, etc.
- Information (scientifically accurate info on main parts, functions, etc.)
- Dangers/warnings tourists may encounter (explain possible problems: heartburn, emphysema, etc.)
- Imports and exports of the areas (food and waste in Digestive Land)
- Interactions with other System Lands (how systems rely upon and support other systems)
- Fun Facts

You will choose one of the following adventure destinations and then you will create a brochure for that particular body system: (1) Nerve Land, (2) Excretory Land (Urinary), (3) Circulatory Land (Cardiovascular), (4) Immune Land, (5) Respiratory Land, (6) Digestive Land, (7) Muscle Land, (8) Skeletal Land, (9) Endocrine Land.

### **Brochure Format**

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- You may use any type of paper (construction, poster board, photo, standard coping paper, etc.) to complete this project. However, this is a brochure so it should be in the format of a brochure.
- The key feature is to give an overall sense of the organization and function of one of the 8 systems. You may use drawings, computer graphics, photographs of actual organs, and pictures from the Internet to help in your advertisement of the system. Whenever possible, type all written parts of brochure. Let your imagination run WILD!
- I have provided a guideline of some important points you may choose to include in your adventure brochure below. You may choose to highlight other aspects of your system. You may choose to include additional topic areas that are of interest to you.

### **Nervous System Guidelines**

OBJECTIVES:

1. Describe the basic structure and function of the nervous system.

2. Describe the structure of a neuron and explain how the neuron is adapted to carry out its function.
3. List the parts and discuss the function of the Central Nervous System (CNS). Discuss the structure and control centers of the brain.
4. Explain what a reflex is.
5. Describe the sensory organs. You may want to describe one in more detail.
6. Describe malfunctions or disorders of the nervous system.
7. Mastery topics (Bonus): Include the effects of drugs on the nervous system? What is spinal cord research and why can't nerves regenerate?

RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Central Nervous System, Peripheral Nervous System, Autonomic N.S., Sympathetic N.S., Parasympathetic N.S., neuron, dendrite, cell body, axon, myelin sheath, node, ganglia, sensory nerve, motor nerve, resting potential, action potential, nerve impulse, sodium-potassium pump, synapse, neurotransmitter, acetylcholine, stimulus, response, effector, receptor, reflex, brain, cerebrum, cerebellum, medulla oblongata, spinal cord, and meninges.

### **The Excretory System Guidelines**

OBJECTIVES:

1. Define excretion.
2. What are nitrogenous wastes and how are they produced?
3. Describe the role of the four organs of excretion; liver, skin, lungs and kidney.
4. Describe the organs of the urinary system.
5. Describe how the kidneys maintain homeostasis.
6. Describe the malfunctions, diseases or disorders of the excretory system.
7. Mastery topic (Bonus): Include the effects of drugs on the Excretory System?

RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Excretion, kidney, nephron, Bowman's capsule, glomerulus, filtration, reabsorption, ureter, urethra, urine, urea, bladder, aorta, renal artery, renal vein, adrenal glands, metabolic wastes, sweat glands, nitrogenous wastes, lungs, skin, and liver.

### **Transport: The Circulatory System Guidelines**

OBJECTIVES:

1. Describe the functions of the human circulatory system.
2. Describe the structure of the heart.
3. Describe the components of blood. (red blood cells, white blood cells, and plasma)
4. Explain how the heart beats. .
5. Explain what is meant by blood pressure.
6. Explain how blood is produced in the body. Describe the role of the spleen and marrow.
7. Discuss diseases, malfunctions or disorders of the heart or circulatory system.
8. Mastery topics (Bonus): What are the following: blood clots, blood type and organ donation.

#### RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Aorta, artery, arteriole, capillary, venule, vein, vena cava, atrium, valve, ventricle, septum, av node, sv node, pulmonary vein, pulmonary artery, circulatory system, pulmonary circulation, systemic circulation, coronary circulation, red blood cells, hemoglobin, Rh factor, white blood cells, platelets, plasma, diastole, systole, diffusion, spleen, bone marrow, sphygmomanometer, pacemaker, lymph, deoxygenated blood (oxygen poor blood).

### **The Endocrine System Guidelines**

#### OBJECTIVES:

1. Describe the function of the endocrine system.
2. Describe three of the endocrine glands and the hormones each makes.
3. Explain how the endocrine system maintains homeostasis.
4. Explain how the pancreas regulates the blood sugar level in humans. Include the complications of diabetes.
5. Describe the action of a hormone on a target organ or cell.
6. Describe the malfunctions, disorders or diseases of the endocrine system.
7. Mastery topic (Bonus): How do steroids affect athletes?

#### RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Hormone, target cell, exocrine gland, endocrine gland, prostaglandin, steroid hormones, nonsteroid hormones, feedback mechanism, pituitary gland, hypothalamus, thyroid gland, parathyroid glands, adrenal gland, pancreas, insulin, glucagon, glycogen, liver, glucose, ovaries, and testes.

### **Digestive System Guidelines**

#### OBJECTIVES:

1. Describe the path of food through the Digestive System.
2. Describe the role of the accessory organs of digestion.
3. Discuss the role of enzymes in digestion.
4. Describe where digestion begins and where digestion ends.
5. Describe the absorption of nutrients in the small intestine.
6. Discuss the importance of water in the digestive system.
7. Mastery topics (Bonus): Why do we count calories? Why do we gain weight?

#### RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Teeth, salivary glands, saliva, bolus, epiglottis, pharynx, larynx, esophagus, peristalsis, stomach, small intestine, villi, lacteal, absorption, large intestine, reabsorption, colon, appendix, liver, gall bladder, bile, rectum, anus, pancreas, enzymes, pH, nutrient, roughage, calorie, mechanical digestion, chemical digestion.

## **Respiratory System Guidelines**

### OBJECTIVES:

1. Identify the structure and function of the parts of the respiratory system.
2. Why should we breathe through our nose?
3. Explain the function of the ribs and diaphragm in the breathing process. .
4. Describe the effects of smoking on respiration.
5. Explain what happens to the respiratory system in the allergic response with asthma.
6. What are the disease or disorders of the respiratory system?
7. Mastery topic (Bonus): Discuss the conditions in which humans undergo anaerobic respiration.

### RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Alveoli, gas exchange, epiglottis, trachea, bronchi, bronchiole, larynx, lung, anaerobic respiration, oxygen debt, pharynx, respiration, trachea, vital capacity, inhalation, exhalation, pleural membrane, cilia, CPR, respiratory control center, diaphragm, mitochondria, aerobic respiration, lactic acid and cellular respiration.

## **The Muscular System Guidelines**

### OBJECTIVES:

1. Identify the structure and function of the parts of the muscular system
2. Describe the three types of muscle tissues in the human body.
3. Describe what ATP is and the three ways in which ATP is generated during muscle activity.
4. Identify the different types of body movements.
5. Name and locate the major muscles of the human body and state the action of each.
6. Explain the importance of a nerve supply and exercise in keeping muscles healthy.
7. Mastery topic (Bonus): Describe the sequence of events involved in the contraction of a muscle.

### RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Actin, antagonist, insertion, myosin, origin, sarcomere, synergist, excitability, contractility, extensibility, elasticity, joint stability, tendon, I bands, A bands, Z line, H zone, myofibrils, myofilaments, ATP, aerobic respiration, anaerobic respiration, oxygen debt, isotonic contractions, isometric contractions, origin, insertion, adductor, abduction, flexion, extension, rotation, and circumduction.

## **The Skeletal System Guidelines**

### OBJECTIVES:

1. Discuss functions of the skeletal system.
2. How many bones are in your body?
3. Identify the structural features of the ribs and sternum.
4. Identify the features of the pectoral girdle and upper extremity.

5. What is a fracture?
6. Compare the structure and function of types of synovial joints.
7. Mastery topic (Bonus): What are some Skeletal Disorders?

RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Diaphysis, epiphysis, articular cartilage, compact bone, epiphyseal plate, foramina, synovial membrane, synovial joints, plane joint, hinge joint, pivot joint, saddle joint, ball-and-socket joint, spongy bone, compact bone, complete fracture, incomplete fracture, open fracture, closed fracture, transverse fracture, spiral fracture, comminuted fracture, displaced fracture, scoliosis, kyphosis, and lordosis.

## **The Immune System Guidelines**

OBJECTIVES:

1. Describe the function of the immune system.
2. Explain how the skin functions as a defense against disease.
3. Describe what happens in an allergic response.
4. Explain the function of the White Blood Cells.
5. Compare passive and active immunity.
6. What are some disorders or disease of the immune system?
7. Mastery topic (Bonus): What happens to the human body when infected with HIV and then a person develops AIDS?

RECOMMENDED VOCABULARY TO USE IN THE BROCHURE:

Immunology, antigen, antibody, lymphocyte, leukocyte, thymus gland, bone marrow, B-cell, T-cell, macrophage, phagocytosis, vaccine, antibiotic, inflammatory response, immune response, antihistamine, autoimmune disease, allergy, fever, helper T cell, pathogen, killer T cells, interferon.

## ***Scoring Guide: Adventure Brochure of a Human Body System***

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0= unsatisfactory, the element described is missing

1= poor, the element is present, but does not meet standard described

2= fair, the element is present and meets standard, but needs some revision or improvement

3= good, the element is present and meets the standard

4= outstanding, the element is present and far **exceeds** the standard

## **Content (X2...40 points possible):**

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- 0 1 2 3 4 Information presented is accurate, factual, and relevant to the specific topic  
 \*spelling counts  
 \*quality of the content presented
- 0 1 2 3 4 Project shows mastery of the physiology of the human system  
 \*includes HOW the system works  
 \*written in students own words
- 0 1 2 3 4 Project shows mastery of the anatomy of the human system  
 \*includes several diagrams of organs  
 \*clearly labeled and described
- 0 1 2 3 4 Adventure brochure clearly illustrates risks associated with travel to the system  
 \*describes at least three malfunctions, diseases or disorders associated with system
- 0 1 2 3 4 Introduction and conclusion are clearly stated and summarized.  
 \*title page includes a lead-in paragraph about the system  
 \*includes a summary of the role of your system in the body

**Travel Brochure (X2...24 points possible):**

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- 0 1 2 3 4 Adventure brochure is neat and flows visually for the reader
- 0 1 2 3 4 Time, energy, effort, enthusiasm, and thoroughness to the project are evident
- 0 1 2 3 4 Adventure brochure exhibits creativity. Why your trip should be picked above all others.

           /48 Total Points. ....Remarks: