Intended Learning Outcomes

**Circulatory System:**

1. Explain the concept of homeostasis and its critical nature of living things.

2. Explain the importance of temperature regulation in maintaining homeostasis.

3. Explain how the human circulatory system helps maintain homeostasis.

4. Explain the need for a transport system.

5. Explain how the circulatory system contributes to the maintenance of equilibrium through its role in the transport of heat and energy and matter.

6. Describe the structure and function of an artery, a vein and a capillary.

7. Relate this structure to the function of each in blood circulation.

8. Identify the main components of the human heart and explain the role of each. Include:
   I) atria  
   II) ventricles  
   III) valves (bicuspid, tricuspid, semilunar)  
   IV) aorta  
   V) pulmonary artery  
   VI) septum

9. Trace a drop of blood through the heart and describe the pulmonary and systemic pathways.

10. Identify the main components of blood and explain the role of each. Include:
    I) erythrocytes  
    II) leukocytes  
    III) platelets  
    IV) plasma

11. Carry out an experiment to relate blood pressure and physical activity and identify the specific variables involved. (Lab)
12. Compile and organize data, using appropriate formats and data treatments, to facilitate interpretation of blood pressure data. (Lab)

13. Identify the impact of circulatory diseases on the homeostasis of an organism. (Angioplasty, clot-busting drugs)

14. Describe disorders linked to the circulatory system and their effect on the homeostasis of the system and the organism as a whole. Include:
   I) hypertension
   II) artherosclerosis
   III) arteriosclerosis
   IV) coronary blockage

15. Analyse why and how technology related to the treatment of circulatory disorders was developed and improved over time.

16. Described the progress from bypass surgery to modern techniques such as shunts, angioplasty and clot busting drugs.

**Respiratory System:**

17. Explain how the human respiratory system helps maintain homeostasis.

18. Explain the need for a respiratory surface in humans.

19. Identify and state the function of:
   I) nasal cavity
   II) trachea
   III) bronchi
   IV) bronchioles
   V) alveoli
   VI) diaphragm

20. Investigate the mechanics of inhalation/exhalation and regulation of the breathing cycle.

21. Compile and organize data, using appropriate formats and data treatments, to facilitate interpretation of a completed respiratory activity. (Lab activity)

22. Identify how respiratory diseases affect the homeostasis of an organism.

23. Investigate disorders; lung cancer, asthma, and pneumonia.
24. Predict the impact of environmental factors on the respiratory system of an asthmatic.
   I) cigarette smoke
   II) allergens (dust, mould, food)
   III) petrochemical fumes, perfumes

**Digestive System:**

25. Describe the purpose and functioning of the digestive system.

26. Define and explain the relationship between mechanical and chemical digestion.

27. Identify the major organs and glands of the digestion and investigate their role in the digestive process. Include:
   I) salivary glands
   II) stomach
   III) liver
   IV) pancreas
   V) gall bladder
   VI) small intestine
   VII) larger intestine

28. Trace the pathway of food through the digestive tract and explain the efficiency of its structure:
   I) teeth
   II) taste buds
   III) tongue
   IV) mucous lining
   V) villi
   VI) sphincters
   VII) peristalsis activity

29. Identify chemical elements and compounds that are commonly found in living systems.

30. Identify the six basic nutrients: carbohydrates, lipids, proteins, vitamins, mineral and water and determine the sources of each of these nutrients.

31. Identify the role of some compounds involved in digestion.

32. Discuss the role of the six basic nutrients.
33. Discuss the general role of enzymes and secretions, and the role of these substances pertaining to the digestive system.

34. Identify and describe the structure and function of the important biochemical compounds, carbohydrates, proteins and lipids.

35. Explain the role of hydrolysis and dehydration reactions within the digestive system.

36. Discuss the basic structural units of lipids, carbohydrates and proteins.

37. Discuss the basic structure of lipids, carbohydrates and proteins.

38. Describe the end products of digestion for carbohydrates, lipids and proteins.

39. Explain the importance of fitness and nutrition in maintaining homeostasis.

40. Carry out an experiment to investigate the effect of specific variables on the effectiveness of an enzyme. (Lab activity)

41. Describe disorders and the treatment of disorders linked to organs of the digestive system and their effect on the homeostasis of the system and the organ as a whole. Include:
   I) ulcers
   II) gall stones
   III) ileitis/colitis

42. Propose alternative solutions to a given problem, identify the potential strengths and weaknesses of each, and select one as a basis for a plan. Investigate the value of vitamins, minerals and herbal supplements in support of a healthy lifestyle.

43. Evaluate how nutritional deficiencies and starvation diets such as bulimia and anorexia nervosa can adversely affect the equilibrium.

44. Discuss whether the images portrayed through the media and adversely promote positive self image and a healthy lifestyle for men and women.
Excretory System:

45. Explain how the excretory system helps maintain homeostasis.

46. Explain how the following act as organs of excretion:
   I) lungs
   II) skin
   III) liver
   IV) kidney

47. Explain the role of the kidney as an excretory organ in removing metabolic wastes from the body.

48. Identify and describe the main structures of the human urinary system including kidney, ureter, bladder, and urethra.

49. Identify and describe the internal structure of the kidney, including the cortex, medulla, and pelvis.

50. Identify and explain the function and parts of a nephron. Include:
   I) glomerulus
   II) Bowman’s capsule
   III) loop of Henle
   IV) tubules

51. Describe disorders linked to the excretory system and their effect on the homeostasis of the system and the organism as a whole. Include:
   I) kidney stones
   II) kidney infections
   III) bladder infections

52. Analyse and describe examples where technologies were developed to treat renal failure based on scientific understanding. Include dialysis, and kidney transplant.

53. Discuss the merits of funding kidney transplant therapy versus improvements in dialysis technology.

Immune System:

54. Explain the meaning of the terms antigen (allergen), antibody, and their role in an allergic reaction. (Predicting the impact of environmental factors such as allergens on homeostasis within an organism.)
55. Explain how the immune system helps to maintain homeostasis.

56. Explain the complete immune response:
   I) 1st line of defence (physical and chemical barriers)
   II) 2nd line of defence (inflammatory response)
   III) 3rd line of defence (immune response)

57. Compare the role of the various white blood cells in the defence process including phagocytes and lymphocytes.

58. Compare the mechanism of various forms of acquired immunity including passive (breast milk) and active (actual exposure, vaccines).

59. Identify how autoimmune disorders determine diseases such as rheumatoid arthritis.

60. Analyse why and how a particular technology was developed and improved over time.

61. Identify in general terms the impact of viral, bacterial, genetic, and environmental diseases on the homeostasis of an organism.