**KGS N4N5 Unit 2 – Transport Systems Learning Outcomes**

**Cells, Tissues, Organs & Body Systems**

* Cells can join together to make tissues eg. muscles cells join together to make muscle tissue which can contract and relax.
* Different tissues join together to make organs eg. Muscle and nerve tissue are found in the heart.
* Roles of different organs e.g. the heart pumps blood around the body, the lungs take in oxygen and remove carbon dioxide
* Organs can link together to form Body Systems e.g. Circulatory System, Nervous System, Digestive System, Urinary System,
* Technology can be used to monitor the health of different parts of the body e.g. Peak Flow Meters, Respirometers, BP Monitors, Thermometers

Breathing

* Gases are exchanged in the lungs
* During Breathing the diaphragm lowers, the rib cage raises, the lungs inflate and the intercostal muscles contract when breathing in
* The windpipe is also called the Trachea
* The trachea is held open at all times by rings of cartilage
* The trachea divides into two Bronchi
* The two bronchi divide up into bronchioles with air sacs (called alveoli) at the end
* Mucus in the trachea traps dirt and germs
* Cilia are tiny hairs in the trachea which sweep the mucus containing germs up to the mouth
* In the lungs oxygen moves from inside the air sac to the blood and carbon dioxide moves from the blood to inside the air sac
* The lungs are efficient at gas exchange because they have lots of air sacs (large surface area), lots of blood capillaries and their surface is moist which allows the gases to dissolve.

The heart

* The 4 chambers of the heart are the Right Atrium, Right Ventricle, Left Atrium,

 and Left Ventricle

* The path of blood through the heart is: From the body TO Vena Cava Vein

Right Atrium

Right Ventricle

Pulmonary Artery

THE LUNGS

Pulmonary Vein

Left Atrium

Left Ventricle

 From Aorta Artery TO the BODY

* The heart valves stop blood flowing backwards
* The left ventricle of the heart is thicker as it has to pump blood to the whole body whereas the right ventricle only has to pump blood to the lungs
* The valves in the heart are found between the Atria and Ventricles and between the exit for the pulmonary artery and pulmonary vein
* The heart muscle gets blood from the Coronary Arteries

Blood vessels

* The three types of blood vessel are Arteries, Capillaries and Veins
* Arteries have thick muscular walls, a narrow channel and carry blood under high pressure AWAY from the heart
* The pulse indicates that blood is flowing through an artery
* Capillaries are thin walled to allow the exchange gases, food and wastes
* Oxygen leaves capillaries and goes into tissues/cells
* Carbon Dioxide leaves tissue/cells and goes in Capillaries
* Veins thin muscular walls and a wide channel and carry blood under low pressure TO the heart
* Veins contain valves to prevent blood flowing backwards
* Veins carry Carbon Dioxide and Wastes up to the heart

Blood composition

* Red blood cells are specialised to carry Oxygen
* Haemoglobin, found in red blood cells, combines with oxygen in the lungs (Oxyhaemoglobin)
* Oxyhaemoglobin releases oxygen at tissues becoming Haemoglobin again
* Plasma carries Carbon Dioxide and Wastes

Food

* Food is required by animals for Growth, Movement, Reproduction, Warmth
* The chemical elements in Carbohydrates are Carbon, Hydrogen & Oxygen
* The chemical elements in Fats are Carbon, Hydrogen & Oxygen
* The chemical elements in Proteins are Carbon, Hydrogen, Oxygen & Nitrogen
* Carbohydrates are needed to provide us with energy
* Fats are needed for heat insulation and energy storage
* Proteins are needed for growth and repair
* Vitamins and Minerals are needed for good health to help with chemical reactions
* Simple units of Carbohydrates are Sugars e.g. glucose
* Simple units of Fats are Fatty Acids & Glycerol
* Simple units of Proteins are Amino Acids
* Carbohydrates are broken down by amylase enzymes into Sugars (Glucose)
* Fats are broken down by lipase enzymes into Fatty Acids & Glycerol
* Proteins are broken down by Pepsin enzymes into Amino Acids

Digestion

* Digestion is the breakdown of large food particles into smaller particles to allow them to be absorbed through the small intestine wall into the blood
* The digestive system consists of the mouth, salivary glands, oesophagus, stomach,pancreas, liver, gall bladder small intestine, appendix, rectum and anus
* Peristalsis is the movement of food through the gut. It involves muscles contracting behind the food and muscles relaxing in front of the food

Mechanical breakdown of food

* 4 types of teeth are Incisors, Canines, Pre-molars and Molars
* Incisors are for Piercing
* Canines are for Gripping/Tearing meat
* Pre-molars/Molars are for crushing and grinding

Chemical breakdown of food

* Chemicals that breakdown Foods are called Enzymes
* Contractions of the stomach helps in digestion as it mixes the food with enzymes

Absorption of food

* The structure of the small intestine is related to its function as it is very long, folded and it has finger-like projections called villi. All of these give a large surface area for food absorption.
* Villi are very thin walled, they have a lacteal (for fats and glycerol to pass into) and they have a good blood supply (for glucose and amino acids to pass into).
* The final reabsorption of water occurs in the large intestine