

SCIENCE NOTES – SECTION 1

Blood Cells

- (1) White blood cells fight infection.
 - (2) An **antigen** is a substance that stimulates the production of **antibodies** in white blood cells that protect us from disease.
 - (3) In the ANTIGEN sequence,
AT is always paired to AS.
AG is always paired to AC.
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- (4) Red blood cells carry oxygen to the body.
 - (5) In higher altitudes, you would need more red blood cells to carry oxygen because there is less oxygen at a higher altitude.

Blood Vessels

- (6) Arteries are the largest blood vessels, then veins, then capillaries.
- (7) Arteries carry blood away from the heart throughout the body.
- (8) Arteries are able to pump your blood so well because the walls are elastic, so they give as they pump.
- (9) Artery walls are thicker than vein walls.
- (10) Certain nerve impulses can cause arteries to dilate (become larger) or contract (become smaller).
- (11) When blood vessels are wide open, blood can flow through easily.
- (12) When blood vessels are narrow, it's harder for the blood to flow through them, and the pressure inside them increases.
- (13) Then high blood pressure may occur. When this happens, the heart becomes strained, and blood vessels may become damaged.
- (14) Changes in the blood vessels that supply blood to your kidneys and brain may cause the kidneys and brain to be affected.
- (15) When high blood pressure exists, there is an increased risk of stroke, congestive heart failure, kidney failure, or heart attack.

- (16) When high blood pressure exists with obesity, smoking, high cholesterol, or diabetes, the risk of heart attack or stroke increases several times.
- (17) Veins are wider than arteries.
- (18) Veins return blood from the body to the heart.
- (19) Capillaries are so tiny that red blood cells must go through them one cell at a time. Capillaries take the blood to the muscles.
- (20) Capillaries expand when you are more active.
- (21) Capillaries will expand the most during an activity, such as running.

The Heart

- (22) The blood flow from the body to the heart to the lungs and back to the heart is as follows. Blood flows from the
 - a) superior and inferior vena cava to the
 - b) right atrium to the
 - c) right ventricle to the
 - d) pulmonary arteries to the
 - e) lungs to the
 - f) left atrium to the
 - g) left ventricle back to the
 - h) body
- (23) The walls of the left ventricle are thicker than the other chambers because the left ventricle is responsible for pumping blood throughout the body; therefore, the left ventricle has to work harder.
- (24) From 1988 to 1999, there was an 8% **decrease** in the mortality rate (death rate) due to heart disease. The contributing factor for this decrease in the death rate due to heart disease is the new kinds of heart medicine available for public use.
- (25) An EKG is an electrocardiogram, which measures heartbeat rhythm and rate.
- (26) A heart murmur is caused by a valve in the heart that doesn't close properly.
- (27) A doctor would install a pacemaker in a heart to regulate the heartbeat.
- (28) A heart transplant would require the most blood.

- (29) Too much cholesterol would cause the most heart disease.
- (30) Cigarette smoking causes heart disease, emphysema, and cancer.
- (31) A person who smokes is more likely to get one of these diseases.
- (32) Caffeine stimulates and speeds up the heart rate.
- (33) In an experiment, worms were given tobacco to see what effect caffeine would have on them. It was discovered that caffeine harmed the worms.

Blood Types

- (34) There are four blood types.
 1. **Blood Type A has only A molecules.**
 2. **Blood Type B has only B molecules.**
 3. **Blood Type O has a mixture of both A and B.** Blood Type O is the most common blood type. It is the universal **donor**. This means it can be **donated** to others with a different blood type.
 4. **Blood Type AB** is the rarest. It is the universal **recipient**. This means a person with AB blood can **receive** blood from anyone.
- (35) Blood types become very important when a blood transfusion is necessary. In a blood transfusion, a patient must receive a blood type that is compatible with his or her own blood type. The donated blood must be accepted by the patient's own blood. If the blood types are not compatible, red blood cells will clump together, making clots that can block blood vessels and cause death.
- (36) A hospital would probably want to stock Blood Type O since it is a universal donor.
- (37) If a mother is RH-, the father RH+, and the baby RH+, the mother's blood can build up antibodies to the baby's blood and cause the baby to die.

The Digestive System

- (38) Blood is needed by the stomach to help digest food, which is why you should not run after you eat.
 - (39) Chew your food instead of swallowing it whole because the digestive process begins in the mouth, where saliva breaks down food.
 - (40) The **DIGESTIVE SYSTEM** goes like this.
 - a) **Mouth**
Enzymes in the saliva break down food. Saliva also contains mucus, which makes the food slippery enough to pass easily through the body.
 - b) **Esophagus**
The esophagus is the tube that connects the mouth and the stomach.
 - c) **Stomach**
The stomach is where more enzymes and stomach acid, called **HYDROCHLORIC ACID**, break down food and kill bacteria.
 - d) **Small Intestine**
Nutrients from food pass from the small intestine into the bloodstream.
 - e) **Large Intestine**
The large intestine is mainly responsible for storing waste.
 - (41) An **enzyme** is a **catalyst** (way) which speeds up a chemical reaction.
 - (42) In the digestive system, enzymes speed up the chemical reaction, digestion.
 - (43) An example of this is saliva. Saliva, contains **enzymes**, which speed up the breaking down of food in your mouth. Without this catalyst, (enzymes) it would take weeks to digest our food.
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- (44) Red meat clogs arteries.
 - (45) Butter is a good source of good fat.