- Both O2 and CO2 are transported by the protein hemoglobin, CO2 is also transported by other ways.
- Hemoglobin: is a complex protein made by immature red blood cells. There are 4 types of hemoglobin.
- Type 1 & 2 are called *embryonic* and *fetal hemoglobin*: which are unique forms of hemoglobin found in the red blood cells of embryos and fetuses only.
- Type 3 is *adult hemoglobin*: which consists of 4 subunits, each containing one iron-based heme group. It is this heme group that oxygen binds to, so one hemoglobin can carry up to 4 oxygen molecules.
- Type 4 is an altered hemoglobin called *hemoglobin-S*. This type is found in individuals who have a disease called sickle-cell anemia.
- Transport of O2: Once oxygen diffuses through the respiratory membranes into the blood, it is transported to all the cells of the body. Approximately 98.5% of oxygen is transported bound to hemoglobin within red blood cells.
- Transport of CO2: CO2 is a byproduct of the breakdown of glucose. CO2 diffuses out of individual cells into the blood. The blood concentration of CO2 needs to be tightly regulated because too much of it in the blood causes the blood to become acidic.
- There are 3 ways CO2 is transported in blood: (1) dissolved in the plasma, (2) bound to hemoglobin and (3) converted to bicarbonate ion.

Describe how blood pH,

Define Asthma and list the symptoms and treatment of this condition:

- Asthma is a condition of the lungs in which widespread narrowing of airways occurs, caused by contraction of smooth muscle, edema of the mucosa and mucus in the lumen of the bronchi and bronchioles.
- Symptoms include: rapid and shallow breathing, wheezing (a whistle sound when breathing), coughing and shortness of breath.
- Treatment: avoid the causing agent (asthma is sometimes brought on by exercise, allergen, chemicals), taking of medication and using bronchodilators.