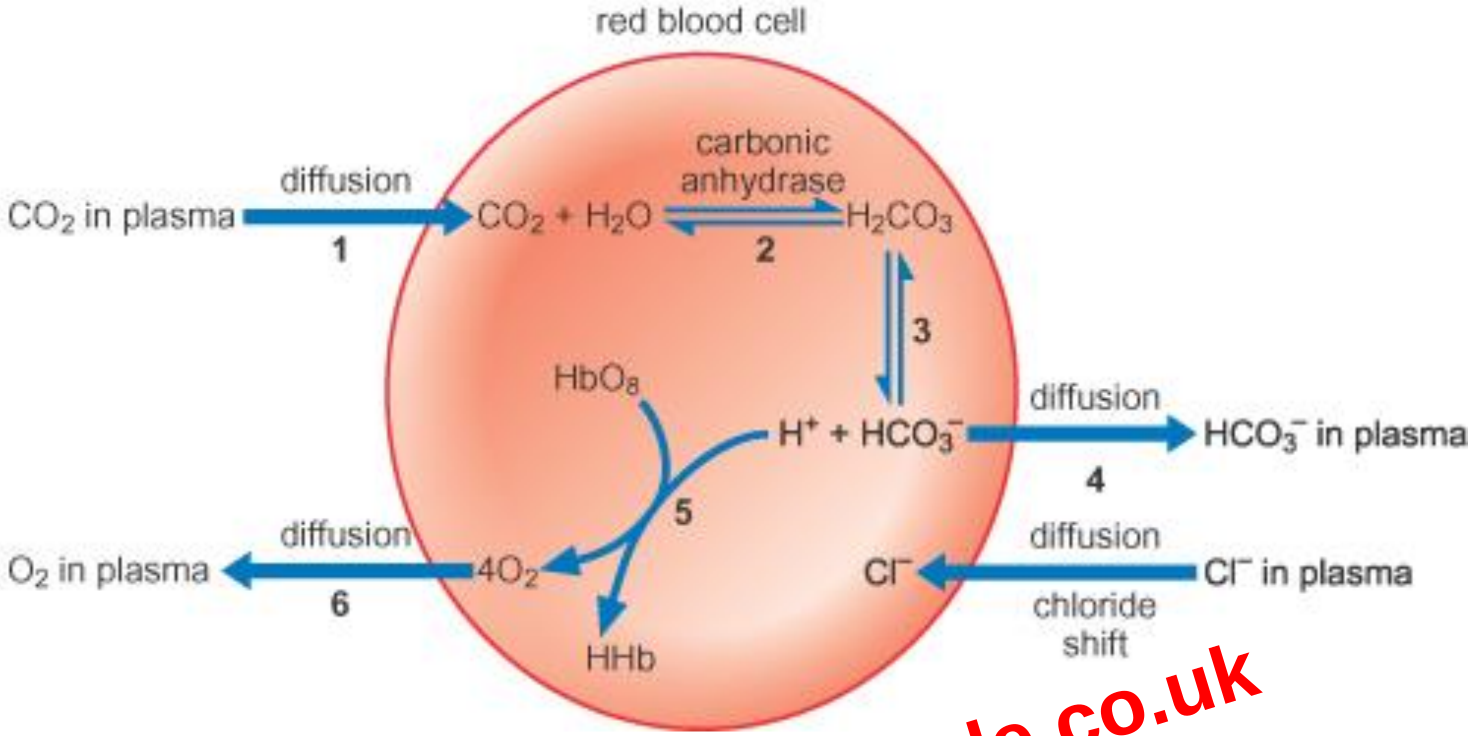
When the blood reaches the lung tissue, where there is relatively low concentration of carbon dioxide, carbonic anhydrase catalyses the reverse reaction, breaking down carbonic acid into carbon dioxide and water. Hydrogencarbonate ions diffuse back into the erythrocytes and react with hydrogen ions to form more carbonic acid. Chloride ions diffuse out of the erythrocytes into the plasma down an electrochemical gradient.

Haemoglobin also acts as a buffer and prevents changes in the pH by accepting free hydrogen ions in a reversible reaction to form haemoglobinic acid. This alters the structure of haemoglobin so more oxygen is released where more respiration occurs or where it is needed.






**The oxygen dissociation curve for fetal and adult human haemoglobin.**
**To include the significance of the different affinities for oxygen and the changes to the dissociation curve at different carbon dioxide concentrations (the Bohr effect).**
The Bohr Effect is when high concentrations of carbon dioxide in the blood reduce the amount of oxygen transported by haemoglobin in active tissues. This occurs because it reduces affinity of haemoglobin for oxygen. In the lungs, where there is a low concentration of carbon dioxide, oxygen binds more easily to the haemoglobin molecules increasing the affinity of the haemoglobin for oxygen.

Foetal haemoglobin has a higher affinity for oxygen than adult haemoglobin so takes up oxygen in low partial pressure of oxygen. If the blood of the foetus had the same affinity for oxygen as the blood of the mother, then little or no oxygen would be transferred to the blood of the foetus. The placenta has a low partial pressure of oxygen so the adult oxyhaemoglobin will dissociate and release oxygen.