

The Respiratory System: Gas Transport

- Oxygen transport in the blood:
_____% is bound to hemoglobin
_____% dissolves in plasma
- The hemoglobin molecule is composed of ____ polypeptide chains and ____ heme groups containing iron.
What does oxygen bind to? _____
- After one oxygen molecule (O_2) binds to hemoglobin, it is easier for the other molecules to bind to the hemoglobin.
This is known as _____.
- When oxygen is loaded onto hemoglobin in the lungs, hemoglobin is called _____, and when oxygen is unloaded from the hemoglobin at the tissues it is called _____.
- From the oxygen-hemoglobin dissociation curve, we see the following:
Lungs: Partial pressure of oxygen is ____ mmHg
 Hemoglobin is ____% saturated
Tissues: Partial pressure of oxygen is ____ mmHg
 Hemoglobin is ____% saturated
- Effect of high altitude on lung PO_2 :
With a decrease of 20 mmHg in the lungs, will the saturation of hemoglobin decrease significantly?

- Effect of exercise on tissue PO_2 :
With a decrease of 20 mmHg in the tissues, will the saturation of hemoglobin decrease significantly?
_____.
How does this help the tissues? _____.
- Name the other factors that alter PO_2 :
During exercise, would an increase (\uparrow) or decrease (\downarrow) in these factors decrease PO_2 hemoglobin saturation, making more O_2 available to the tissues?

These factors would shift the oxygen-hemoglobin curve to the _____.

9. List the percentages for CO₂ transport in the blood:

____% dissolved in plasma

____% combined with hemoglobin

____% converted to bicarbonate ions

When CO₂ binds to hemoglobin, it is called _____.

10. CO₂ transport as bicarbonate ions:

CO₂ binds with water to form _____ acid.

The catalyst for this reaction is _____.

The acid mentioned above then dissociates into _____ ions and _____ ions.

When bicarbonate ions move out of the red blood cell, _____ ions move in.

This is known as the _____ shift.

The reaction occurs in the opposite direction at the lungs so that CO₂ can be released.

11. A decrease in hemoglobin O₂ leads to an increase in CO₂ loading. Said another way, O₂ loading facilitates CO₂ unloading. (Note: The effect is on CO₂ loading and unloading.)

This is known as the _____ effect.

12. A decrease in CO₂ loading facilitates _____ unloading from hemoglobin. Said another way, CO₂ loading facilitates O₂ unloading. (Note: The effect is on O₂ loading and unloading.)

This is known as the _____ effect.