

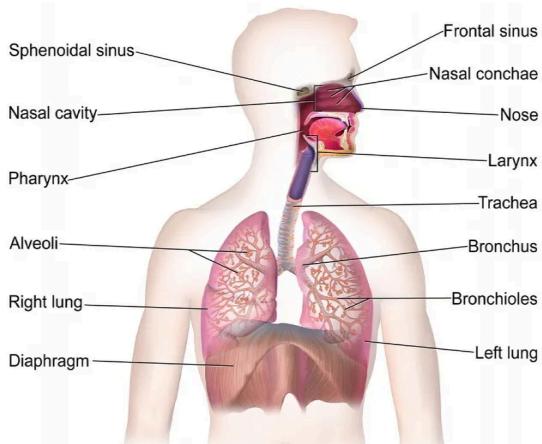
# General Topic: Respiratory and Circulatory Systems

## Lesson Overview:

The **respiratory system** is responsible for **gas exchange**—bringing oxygen into the body and removing carbon dioxide. The circulatory system transports oxygen, nutrients, and hormones to cells and removes waste products. These two systems work together to maintain life processes.

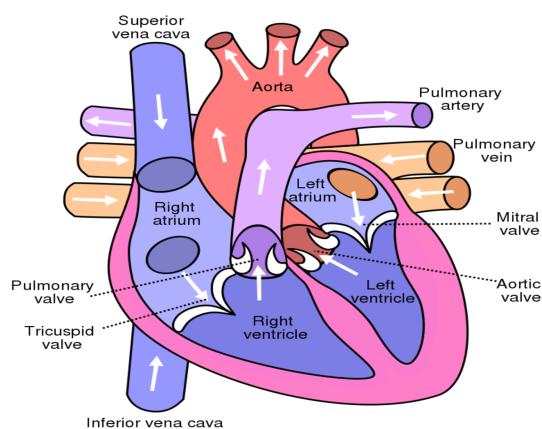
## Key Concepts and Subtopics:

### 1. Respiratory System Parts & Functions – Nose, trachea, lungs, alveoli



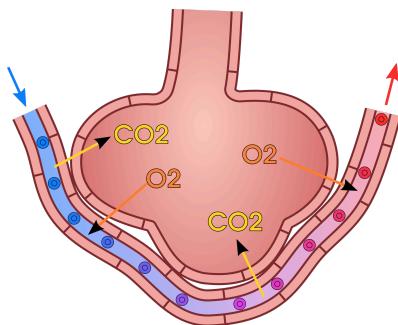
Reference:<https://www.scribd.com/document/353279879/Parts-Function-of-Respiratory-System>

### 2. Circulatory System Parts & Functions – Heart, blood vessels, blood components



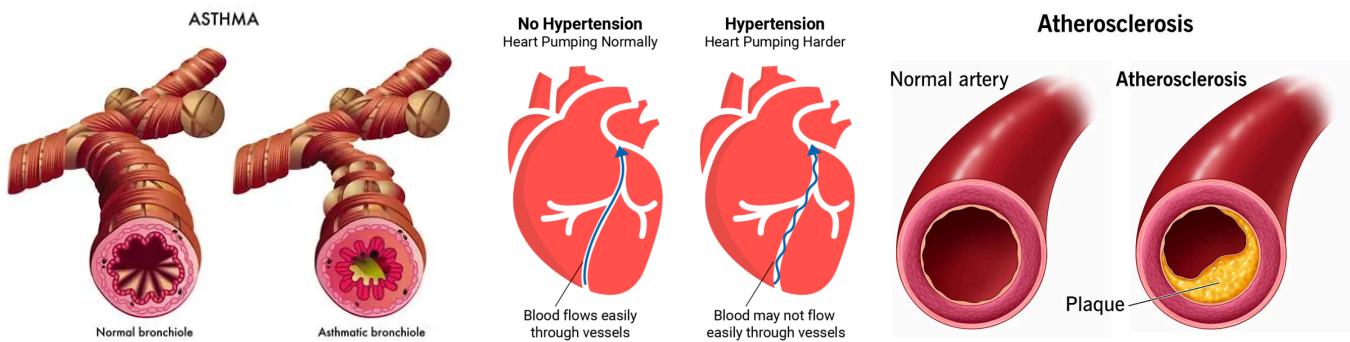
Reference:<https://discover.hubpages.com/education/4-Main-Parts-of-Circulatory-System-and-How-It-Works>

### 3. Gas Exchange Process – Diffusion of O<sub>2</sub> and CO<sub>2</sub> in alveoli and capillaries



Reference:<https://thesicktwins65smmanual.z21.web.core.windows.net/diagram-the-alveoli-and-illustrate-the-process-of-gas-exchange.html>

### 4. Disorders – Asthma, hypertension, atherosclerosis



Reference:<http://www.childrensrespiratorydoctor.co.uk/asthma.php>; <https://publichealthnotes.com/hypertension/>; <https://my.clevelandclinic.org/health/diseases/16753-atherosclerosis-arterial-disease>

### Real-Life Example:

Athletes' breathing and heart rates increase during exercise to meet the higher oxygen demand of muscles.

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### Remember This!

- *The respiratory and circulatory systems are partners—when one fails, the other is affected.*

# **General Topic: Heredity and Biodiversity**

## **Lesson Overview:**

**Heredity** is the passing of traits from parents to offspring through genes. **Biodiversity** refers to the variety of living organisms in an ecosystem, essential for ecological balance and adaptation.

## **Key Concepts and Subtopics:**

**1. DNA and Genes** – Basic units of heredity

**2. Mendelian Genetics** – Dominant and recessive traits, Punnett square

**3. Biodiversity Importance** – Stability of ecosystems, source of resources

**4. Threats** – Habitat loss, pollution, climate change

## **Real-Life Example:**

Plant breeders use knowledge of heredity to create crops that resist pests and grow in various climates.

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## **Remember This!**

- *Genetics explains why you look like your parents; biodiversity ensures life on Earth thrives.*

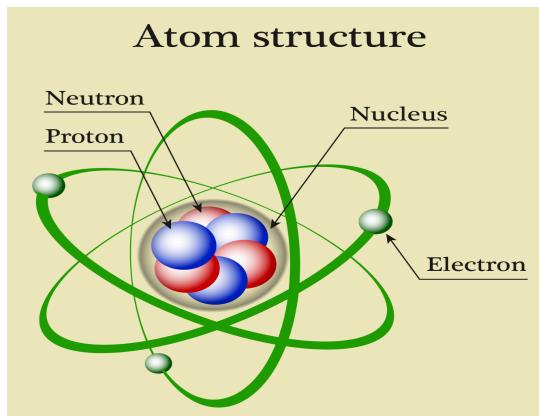
# General Topic: Atomic Structure, Bonding, and Carbon Compounds

## Lesson Overview:

Atoms are the **basic units of matter**, consisting of protons, neutrons, and electrons. Chemical bonding (ionic, covalent, metallic) determines how atoms combine to form compounds. Carbon compounds are the basis of organic chemistry, essential for life.

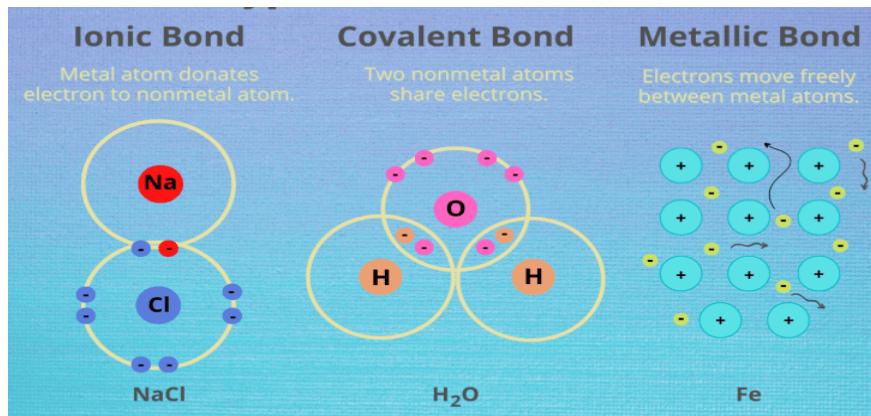
## Key Concepts and Subtopics:

1. Atomic Structure – Nucleus, electron shells, atomic number, mass number



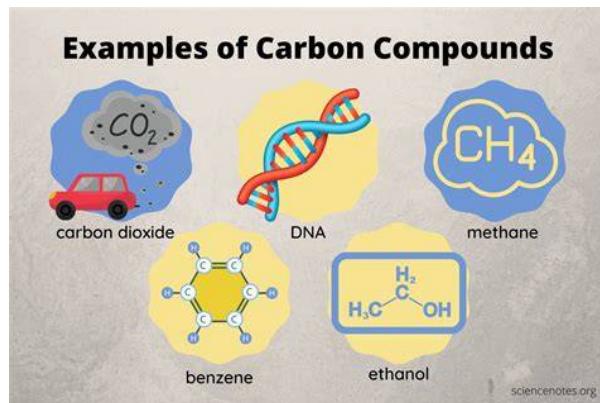
Reference: <https://edex.adobe.com/teaching-resources/atomic-structure>

2. Types of Bonds – Ionic, covalent, metallic



Reference: <https://sciencenotes.org/types-of-chemical-bonds/>

### 3. Carbon Compounds – Hydrocarbons, alcohols, acids



Reference: <https://sciencenotes.org/carbon-compounds-and-examples/>

### 4. Importance in Daily Life – Fuels, plastics, medicines

#### Real-Life Example:

Water ( $\text{H}_2\text{O}$ ) forms through covalent bonding; table salt ( $\text{NaCl}$ ) forms through ionic bonding.

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#### Remember This!

- *The way atoms bond determines the properties of everything around you—from metals to medicines.*

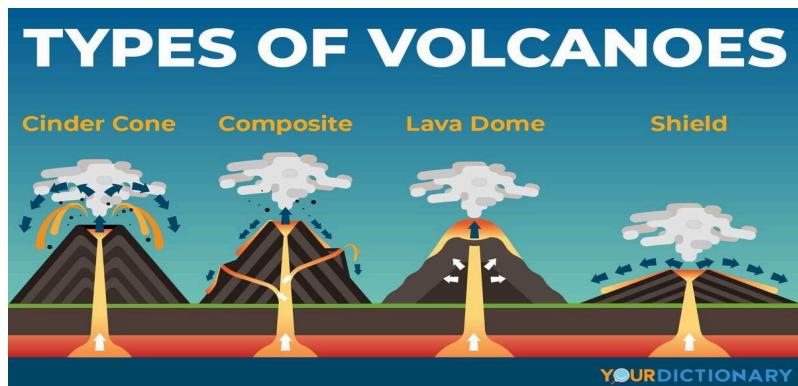
# General Topic: Volcanoes, Climate Phenomena, Constellations

## Lesson Overview:

Earth science covers natural processes and phenomena. **Volcanoes** form when magma from beneath the Earth's crust erupts. **Climate phenomena** include patterns like El Niño and La Niña that affect weather worldwide. **Constellations** are patterns of stars used for navigation and storytelling.

## Key Concepts and Subtopics:

1. **Volcano Types** – Shield, composite, cinder cone



2. **Climate Phenomena** – Causes and effects of El Niño/La Niña

3. **Constellations** – Seasonal visibility, importance in ancient navigation

## Real-Life Example:

Farmers adjust planting schedules based on El Niño and La Niña forecasts to avoid crop damage.

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## Remember This!

- Studying Earth and space phenomena helps us prepare for natural events and understand our place in the universe.

# **General Topic: Projectile Motion, Momentum, Energy, Electricity**

## **Lesson Overview:**

Physics in Grade 9 explores how objects move and interact. **Projectile motion** is the curved path of an object thrown into the air. **Momentum** measures motion based on mass and velocity. **Energy** exists in many forms and can be transformed but not destroyed. **Electricity** powers most of our modern world.

## **Key Concepts and Subtopics:**

- 1. Projectile Motion** – Horizontal and vertical components
  
- 2. Momentum** –  $p = mv$
  
- 3. Energy Forms** – Kinetic, potential, mechanical, electrical
  
- 4. Electricity Basics** – Current, voltage, resistance (Ohm's Law)

## **Real-Life Example:**

Basketball players use projectile motion principles to make accurate shots, while engineers calculate momentum in car safety designs.

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## **Remember This!**

- *Physics explains everything from the arc of a ball to the power running through your phone charger.*