

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



**Pakistan School**  
Kingdom of Bahrain

# Carbon Dioxide

CLASS: 9TH

# Rules of the Class

- ❖ Be on **time**
- ❖ Enter the class with your **name** and **CPR number**
- ❖ **Respect** all participants
- ❖ Do **not** create any disturbance
- ❖ **Raise your hands** for questions (the teacher will respond when the time is suitable)
- ❖ Pay **attention** to the teacher
- ❖ Follow the **time table**

# Lesson Objectives

At the end of this lesson, students should be able to identify and explain each of the following:

- ❖ Describe three basic elements necessary for life
- ❖ Differentiate between allotropic forms of carbon  
And different types of carbon compound



**CARBON**



# Allotropic types of Carbon

- ❖ Allotropy is existence of an element in different physical forms due to different arrangement of atoms in space
- ❖ These different crystalline forms are called allotropes
- ❖ Physical properties are different but chemical properties are the same in allotropes
- ❖ Two allotropic forms of carbon are: diamond and graphite



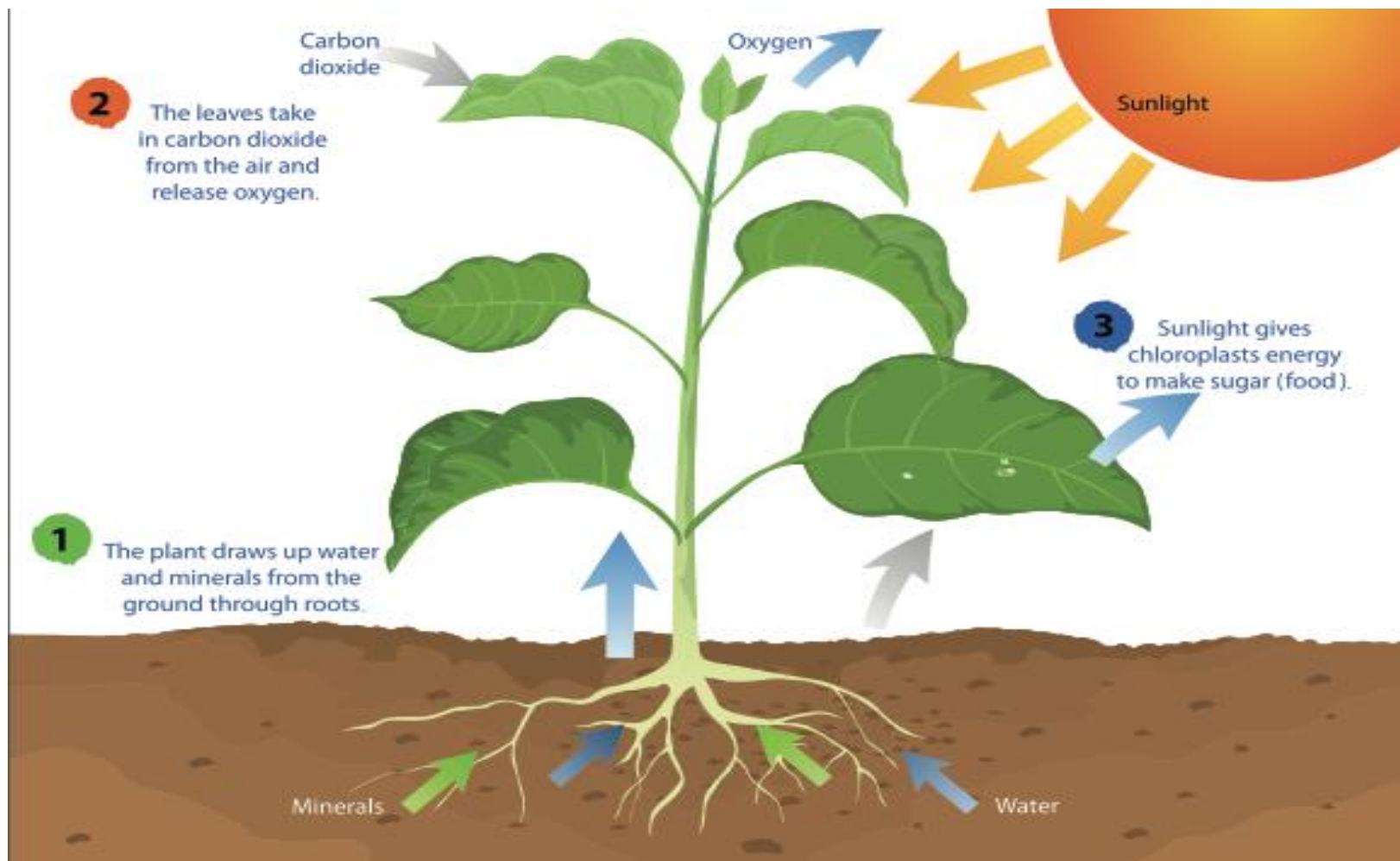


**Graphite**



# Role and use of CO<sub>2</sub>

- ❖ Percentage of Carbon dioxide is very **small** but very important
- ❖ Used by plants during **photosynthesis** to prepare food using CO<sub>2</sub> and **water vapours** in presence of **sunlight**
- ❖ CO<sub>2</sub> plays a vital role in maintaining **temperature** of Earth
- ❖ **Paper** and **ink** are composed of carbon containing compounds



# Uses cont'd...

- ❖ **Paints** and **plastic** used for protection and decoration
- ❖ **Soap** and **detergents** used for washing purposes
- ❖ **Rubber** and **leather** used for tyres
- ❖ **Polymers** used for shopping bags, household articles, casing for electronic etc
- ❖ **Fuel** for combustion, coal, petroleum and gas

# Graphite

- ❖ It is a soft, black and solid in nature
- ❖ It has metallic luster
- ❖ Used in lead pencils
- ❖ Good conductor of electricity
- ❖ Being soft, it can also be used as lubricant in machines

# Diamond

- ❖ Diamond is purest form of carbon
- ❖ It is hardest naturally occurring substance
- ❖ Very high melting point  $3500^{\circ}\text{C}$
- ❖ Non conductor of electricity
- ❖ Used in drilling tools, glass cutting and other grinding devices because of hardness
- ❖ Also used as gems in jewelry

# Comparison

## Diamond

Colourless in pure state

Transparent and shiny

Hard in nature

Bad conductor of electricity

Changes to graphite in high temperatures

## Graphite

Grayish black in colour

Opaque

Soft and slippery

Good conductor of electricity

Remains unchanged in high temperatures

The background is a solid orange color. It is covered with a dense pattern of 3D question marks of various sizes. In the center, there is a large, semi-transparent watermark that reads 'Q & A' in a bold, serif font. The 'Q' is on the left, followed by an ampersand '&', and then the 'A' is on the right. The text 'QUESTIONS & ANSWERS' is overlaid on this watermark in a white, bold, sans-serif font.

# **QUESTIONS & ANSWERS**

# Do we eat Carbon?

- ❖ Carbon atoms make up an immense part of our molecular structure
- ❖ Carbon is therefore an essential component of the human diet
- ❖ Foods we consume make carbon readily available to us
- ❖ Fruits, vegetables, grains and meat all contain abundant sources of Carbon.



# Is graphite smooth and slippery?

- ❖ Graphite is soft and slippery because its carbon atoms are bound together by weak bonds known as Van der Waal forces
- ❖ The bonds that connect the carbon atoms in graphite are very weak
- ❖ They are easily broken and this makes graphite seem soft and slippery

# Which is harder diamond or graphite?

- ❖ Both are made of carbon
- ❖ The sheets of carbon become bonded by weaker intermolecular forces
- ❖ These weak forces cause the layers of graphite to slide over each other
- ❖ Thus, making the overall substance a lot weaker than diamond

An illustration on a solid orange background featuring three stylized human figures. On the left, a person with long dark hair and a striped shirt stands with their back to the viewer, reaching up towards a large gear. In the center, a person with a beard and a checkered shirt stands facing the viewer, also reaching up. On the right, a person in a striped shirt and pants is kneeling, interacting with a plant. Large, light-orange gears are positioned behind the figures. The scene is decorated with small white stars and abstract plant-like shapes. The word "ACTIVITIES" is written in large, bold, white capital letters across the middle of the image.

# ACTIVITIES

# Fill In The Blanks

1. The different crystalline forms of an element are called \_\_\_\_\_.
2. Allotropy is due to different \_\_\_\_\_ of atoms in an element.
3. \_\_\_\_\_ is a good conductor of electricity.
4. Diamond is the \_\_\_\_\_ form of carbon.
5. Diamond is the \_\_\_\_\_ naturally occurring substance.

# True / False

1. Diamond and graphite are allotropes of oxygen. **T/F**
2. Graphite is soft, slippery and opaque. **T/F**
3. Diamond is the hardest naturally occurring substance. **T/F**
4. At high temperatures, diamond does not change its structure. **T/F**
5. Organic compounds have carbon, oxygen and hydrogen elements. **T/F**
6. Carbon dioxide is used up by plants during photosynthesis. **T/F**

A close-up photograph of a vibrant pink daisy flower with a yellow center, set against a solid light orange background. The flower is positioned on the left side of the frame, with its stem extending upwards. The petals are numerous and layered, creating a full, rounded appearance. The center is a dense cluster of yellow stamens.

**FINALLY...**

# Homework

## Questions:

Q1. Define allotropy.

Q2. What are allotropes?

Q3. Name some allotropes of carbon.

# Assalamu Alaikum

MAY ALLAH SWT BLESS YOU ALL

