بسم اللہ الرحمن الرحیم

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

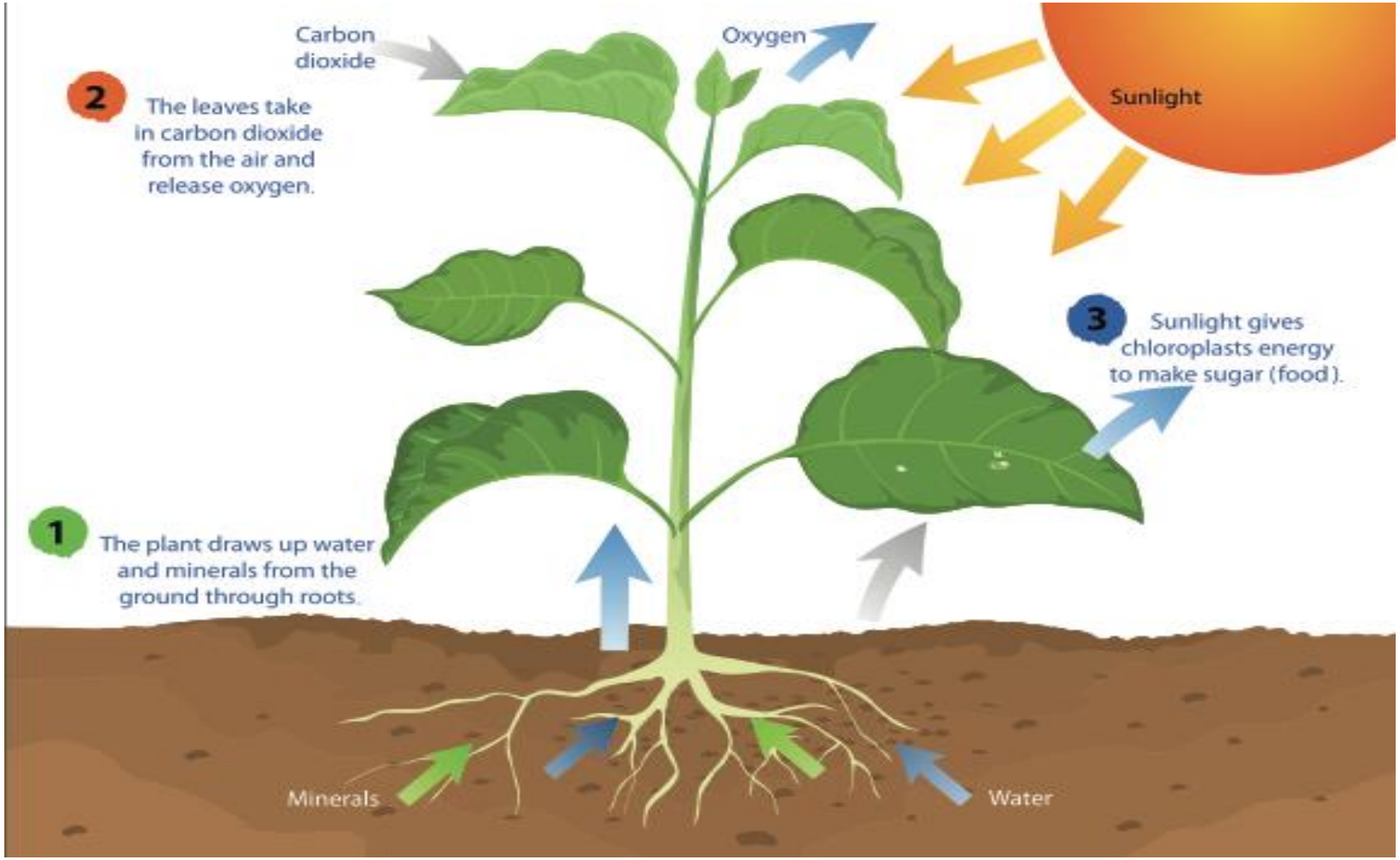
Allotropic types of Carbon

- 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_2

- Percentage of Carbon dioxide is very small but very important
- Used by plants during photosynthesis to prepare food using CO_2 and water vapours in presence of sunlight
- CO_2 plays a vital role in maintaining temperature of Earth
- Paper and ink are composed of carbon containing compounds


Carbon dioxide
Oxygen
Sunlight
2
The leaves take in carbon dioxide from the air and release oxygen.
3
Sunlight gives chloroplasts energy to make sugar (food).
1
The plant draws up water and minerals from the ground through roots.
Minerals
Water

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° 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	Graphite
Colourless in pure state	Grayish black in colour
Transparent and shiny	Opaque
Hard in nature	Soft and slippery
Bad conductor of electricity	Good conductor of electricity
Changes to graphite in high temperatures	Remains unchanged in high temperatures

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

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**

FINALLY...

Homework

Questions:

Q1. Define allotropy.

Q2. What are allotropes?

Q3. Name some allotropes of carbon.

Assalamu Alaikum

MAY ALLAH SWT BLESS YOU ALL