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Arbaoui Abdellah

Department of Irrigation and Drainage

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"Anglais 1"

First-year engineering students

Semester2

Elaborated by:

Dr. SAFIA BENSAAD

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Table of Contents

Introduction

In the contemporary era, English is regarded as the language of communication, including in its capacity as an international language. English for Engineering represents one of the principal applications of English for a Specific Purpose (ESP). This designation encompasses the teaching and learning of English as a second or foreign language, wherein the objective of learners is to utilize English in a specific domain.

The field of English for Hydraulics Engineering is concerned with the study of the language fundamentals that are necessary for effective communication in the contemporary workplace, particularly within the context of hydraulics. The objective is to attain a high level of proficiency in English communication skills among professionals in the field of hydraulics engineering. Selecting English for Hydraulics guarantees that the linguistic emphasis is pertinent and that the subject matter and assignments equip professionals with the requisite skills to navigate the specific circumstances they are likely to encounter in their professional lives, while optimising their limited time.

This booklet offers first-year engineering students in the field of hydraulics a wealth of opportunities for discussion and analysis. The booklet covers a comprehensive range of subjects, including an in-depth exploration of various topics related to hydraulics. These topics encompass: what is hydraulics engineering, water properties and uses, the utilization of water as a renewable energy source, dams, and climate change. Moreover, a range of tasks have been devised with the objective of fostering the development of students' reading, writing, listening, and speaking skills.

UNIT I: WHAT IS HYDRAULICS ENGINEERING?

1. COMMUNICATE

Look at these illustrations. What does each illustration represent? (Explain)

Hydraulic engineering in Petra (Jordan)

Shushtar, ancient hydraulic system (Iran)

Earliest hydraulics engineering in China

Major irrigation system in Iraq

China's Three Gorges Dam

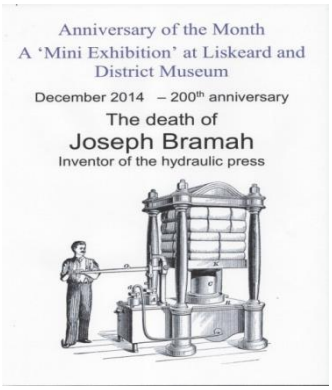
2. **READING COMPREHENSION** *Having a purpose/Previewing*

As a student engineer, having a purpose for reading and previewing are two important reading strategies that can help you read effectively.

- Give some purposes you may have for reading in your field!

a. PASSAGE 01[1]: WATER AND CIVILIZATION

In the distant past, nomadic man needed water for drinking, feared floods, and used water environments for fishing and hunting. Only when he became a sedentary agriculturist along the flat plains of large rivers, did he dig wells, irrigate land, and build levees for protection from floods. These tasks required a well-organized society, thus helping to create states, and with them, civilizations. In that distant past, humans even used navigation, developed the river water wheel for irrigation, and perfected fishing technology



In ancient civilizations, humans created water mills to grind wheat, developed drainage, built canals, aqueducts, and pipes for water transport. They invented water drainage of aquifers by building qanats, and built structures of water displays for aesthetic purposes. The Sichuan irrigation scheme in China already has served for 18 centuries. Large levees along Chinese rivers, Greek water supply systems, and Roman aqueducts are monuments to ancient water technologies. Reservoirs were built for irrigation. Ancient irrigation codes still impress modern irrigation specialists. Use of lead for water pipes may have been the most damaging feature of advanced water technology of ancient times.

The Renaissance of the Middle Ages helped develop the basic principles of hydraulics, and created and perfected many hydraulic structures by using new materials. The Industrial and Post-industrial Age of the 20th and 21st centuries shaped the modern technology of water supply sewage disposal, building of dams and reservoirs, hydroelectric power plants, irrigation, drainage, pollution control, and navigation on rivers and canals. It created a new water discipline, hydrology, as the science of water distribution in space and time on continental areas. Water resources activities centered on development, conservation, control and protection. From simple structures the development went to multi-structure systems, from a simple purpose to a multipurpose approach, and from a simple water source to the use of all sources. This resulted in a new, comprehensive, and integrated form of water resources planning and development.

[1] Perez-Sanchez, A. and Lopez-Jeminez, P. (2020). Continuous Project-Based Learning in Fluid Mechanics and Hydraulic Engineering Subjects for different Degrees. Fluids, 95 (5), 1-15, DOI:10.3390/fluids5020095

A civilization may be conceived as a collection of various infrastructures. The 25–30 main purposes in water resources activities compose a large part of these infrastructures. All solutions of water problems may be sorted into non-structural, structural, and mixed measures. Non-structural measures include regulation and insurance. Structural measures consist of combinations of the four categories of structures: those that transfer water in space; those that change the water regime in time; those that change water power potential; and those that change water quality. Modern water resources planning uses the principles of advanced economics in matching water demand and water supply by selecting and sizing a set of structures as the water resources system. A system always may be decomposed into subsystems for easier analysis, modelling, and synthesis. Often a super system is conceived, like an urban water resources super system consisting of water supply sewage treatment and evacuation, and urban drainage.

Several new phenomena and trends in water resources will influence how civilizations of the 21st century will evolve. Conflicts of interest in water resources activities will likely sharpen, thus requiring all three mechanisms of conflict resolution to be improved: administrative, arbitration and market decisions. Re-allocation of water rights and concessions will be in focus. Pollution of water will be one of the major issues in future water resources planning and development, until consumers become eager to pay for its abatement. Controversies between water resources development and protection of the environment will increase until new methods for their resolution are designed. Cleaning polluted water environments, especially aquifers, will be on the main agenda of water activities in the first half of the 21st century.

b. PASSAGE 02 (Table)[2]: SUBJECTS IN HYDRAULICS ENGINEERING

Code	Subject	Bachelor's Degree	Master's Degree
12298	Hydraulic machines	Chemical Engineering	-
12621	Fluid Facilities in Building	Mechanical Engineering	-
12621	Fluid Mechanics	Chemical Engineering	-
12077	Fluid Mechanics	Electrical Engineering	-
12647	Fluid Mechanics	Mechanical Engineering	-
12349	Fluid Mechanics	Chemistry Engineering	-
12659	Hydraulic machines	Mechanical Engineering	-
33810	Fluid Facilities	-	Industrial Engineering
33752	Waste water treatment	-	Industrial Engineering
33465	Fluid Facilities in the chemical industry	-	Chemical Engineering
32478	Waste water networks	-	Hydraulic and Environmental Engineering
33683	Extension of Fluid Facilities	-	Industrial Engineering
32480	Analysis and modeling of water networks	-	Hydraulic and Environmental Engineering

[2] Vujica Yevjevich. (1992). Water and Civilization, *Water International*, 17(4), 163-171, DOI: 10.1080/02508069208686135

Task 01: Consider the passage above to complete the table below.

Reading Purpose/ Previewing	**Passage 01**	**Passage 02**
Purpose		
What is the title of the passage? Who is the author? What is the source? Is it relevant to your field of study?		
Describe any visuals in the section you have selected to read.		
Provide some comments about the document (e.g., length, number of paragraphs or pages, layout, visuals, etc.).		
What do you think you will learn from this passage?		

Task 02: Answer these questions

1. Back in the dim and distant past, nomadic man .....
   a. irrigated lands b. dug wells c. dreaded floods d. built levees
2. Fundamental principles of hydraulics were developed in .....
   a. the industrial revolution b. recently c. 21st century d. the Renaissance
3. Which of the following statements are false?
   a. Conflicts of interest in water resources activities will decrease.
   b. Water problems can be solved by means of three ways.
   c. Ancient irrigation techniques are useless nowadays.
   d. Linking water demand to water supply is not part of current water resources agenda.

4. According to the table (passage 02): (**True**/**False**)
   a. Waste water treatment is taught to the students of Industrial Engineering Master's degree.
   b. Students studying Chemistry Engineering do not need to have a course of fluid mechanics.

3. LANGUAGE STUDY:

3.1.Structure and Vocabulary:

Task 01: Fill in each gap with the appropriate preposition (on/in/of/with)

1. The first successful efforts to control the flow **.....**water were driven by agricultural needs.
2. Irrigation probably began to develop at a small scale during the Neolithic age **.....** the so-called "fertile crescent," an arc constituting the comparatively fertile regions **.....** Mesopotamia.
3. Self sufficiency **.....** food, led to greater trade and economic development.
4. With a more detailed understanding **.....** the nature **.....** surface water, ground water and rain water; a robust and sustainable water management system was evolved **.....** each of the civilizations that prospered for thousands **.....** years.
5. Ignored or over exploited water systems like **.....** the case **.....** the civilization **.....** Angkor **.....** Thailand could not cope **.....** the severe droughts followed by heavy rains.
6. While some used to tap the mountain streams and glaciers, the others made dams **.....** rivers, some made sustainable storage systems like Kundis **.....** Rajasthan or others tapped ground water like **.....** the Deccan plateau **.....** Maharashtra.
7. The British rule, brought **.....** an urban system **.....** water management more inherent to England than to the Indian region.
8. Irrespective **.....** the geology, topography or hydrology a centralized system rooted **.....** the piped water supply philosophy began to emerge.
9. Cities now rely **.....** catchment systems over 100km away.
10. While millions **.....** litres **.....** rain water fall **.....** the ground every year where we live locally, we let it go and await for the government to spend an immense amount **.....** money to create water storage systems.

Task 02: Choose the best answer among A, B, C, and D to replace the word in bold in each sentence.

1. Water is one of the most **essential** elements of survival for most terrestrial life forms.
   a. predictable b. crucial c. optional d. available
2. Humans have **inhabited** the planet for over 200000 years.
   a. travelled b. left c. habituated d. settled
3. It is only in the last 10,000 years that man has **discovered** how to transport and manage surface and ground water.
   a. built b. deconstructed c. found out d. claimed
4. This has **led to** the domestication of his life.

a. entailed b. decreased c. increased d. managed

5. Aging of hydraulic structures poses many **difficult** problems for their revitalization.
   a. strenuous b. familiar c. several d. usual
6. **Inefficient** and poorly maintained water distribution systems led to large scale diseases and collapses of generations within civilizations.
   a. informal b. old fashioned c. ineffective d. influential

3.2.Hydraulics Terminology:

Task 01: Put one word in each gap

Flow; sewerage; Environmental; fluid; fluid dynamics; technical; computational; infrastructure; storm; surroundings; simulations

Hydraulic Engineering is a specialised field within .....and Civil Engineering. Hydraulic systems are operated or fuelled by the pressure of a **.....** (e.g. water, oil etc.). Hydraulic Engineering deals with the **.....** challenges involved with water **.....** and **.....** design. This discipline is really all about fluid **.....** and how it behaves in large quantities.

Hydraulic Engineers use **.....** theory to predict how flowing water interacts with its **.....**. Students learn how to use **.....** fluid dynamics software packages which allow for complex **.....** of fluid flow. Typically, Hydraulic Engineers are required by utility companies for **.....** water and sewerage maintenance.

Task 02: Write a word beginning with the letter given to you. Then, use the last letter of the previous word as the first letter of another word. Do the same until you reach 10 words!

(**NB**.: **words must be in the field of hydraulics**)

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. .....
9. .....
10. .....

4. *WRITING* *Making Definitions*

The simplest way to make definitions is to use the verb "*to be*" (e.g.: Hydraulics *is* ....). You can also use "*deals with*" and "*is concerned with*" (e.g.: Hydraulics *deals with*/*is concerned with* the application of fluid mechanics to water flowing in an isolated environment or in an open channel.)

Task: Select 5 words from those you found in task 02 in the section of terminology and try to give a short definition for each (Use deal(s) with / is concerned with).

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

5. LISTENING

Task: Listen to an excerpt about "What Does a Hydraulic Engineer Do?" to complete the list of hydraulic engineers' responsibilities below:

1. To study and analyze the details involved in the survey reports and any other data that has the **.....** or **.....** details and to pay attention to the details in the blue prints, maps, and other related drawings
2. To prepare rough cost estimates that would include the cost of the **.....**, material as well as the **.....** cost that is required to complete the project within the given deadline.
3. To lead, direct, and **.....** the staff members and to ensure that all the activities at the actual **.....** are being managed and **.....** effectively.
4. To be involved in **.....** structures and advise the **.....** members regarding any changes that need to be made and communicate it to the senior personnel.
5. To ensure that all the project **.....** have been met and that all the **.....** and sanitation **.....** have been taken care of.
6. To identify the **.....** or any other **.....**, resolve them, and to prepare the **.....** related to various **.....**, deeds, etc.

6. FURTHER PRACTICE:

6.1.Fill in the gaps below according to the definitions given between brackets. The first letter is provided.

1. Hydraulics includes the study and analysis of fluids when in motion and **s.....** (not moving)

2. The part of Hydraulics which **d.....** with the study of static behaviour and interaction of fluids is called as Hydrostatics. (considers)

3. The part of Hydraulics dealing with **f.....** in motion is called Hydrodynamics. (a substance that has no fixed shape and yields easily to external pressure)

5. In Civil Engineering Hydraulics we study fluid **p.....** and behaviour in different civil engineering applications. (characteristics)

6. In Civil Engineering Hydraulics we also study the effect of static fluid, such as, the pressure and **f.....** exerted by water stored in dams on its walls. (strength)

7. **H.....** development, water supply, irrigation and navigation are some familiar applications of water resources engineering. (hydropower)

8. More recently, concern for **p.....** our natural environment and meeting the needs of developing countries has increased the importance of water resources engineering. (maintaining something in its original or existing state)

9. Civil engineers play a **v.....** role in the optimal planning, design and operation of water resource systems. (considerable and important)

10. Hydraulic engineering consists of the **a.....** of fluid mechanics to water flowing in an isolated environment (pipe, pump) or in an open channel (river, lake, ocean). (the action of putting something into operation)

6.2. Fill in each gap with one of the words given in the box.

qualifications; sewage; engineer; machinery; liquids; canals; field; dams; hydraulics

A hydraulics **.....** is a civil engineer who specializes in the properties and movement of **.....** like water and **.....**. In **.....** engineering jobs, projects include designing or overseeing structures like **.....**, bridges, and **.....**. They may also work with **.....** that utilizes hydraulic power. The **.....**you need to begin a career as a hydraulics engineer include a bachelor's degree in mechanical engineering or a similar **.....**.

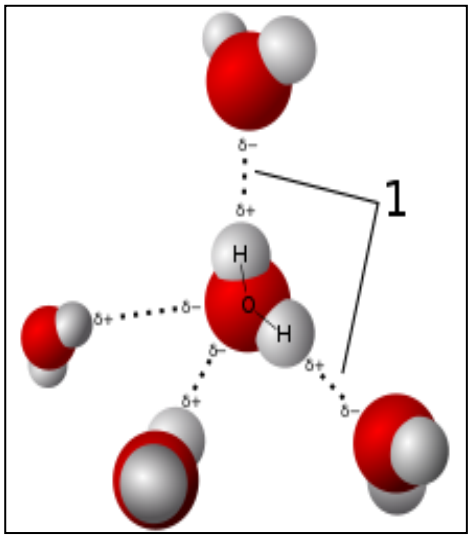
UNIT II: WATER PROPERTIES AND USES

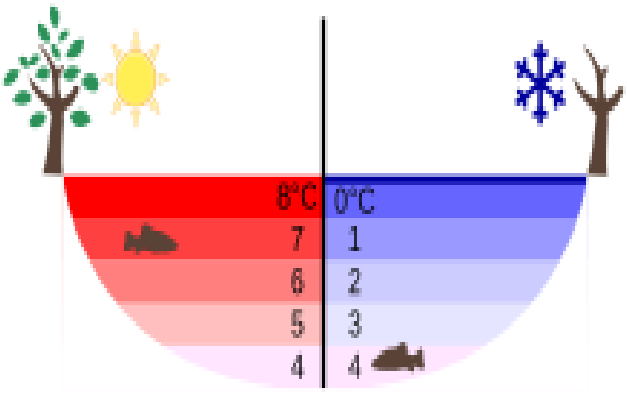
1. COMMUNICATE

a. Write each title under the appropriate picture

a*). Water droplets b). Physical properties of water c). Temperature distribution in a lake in summer and winter d). Hydrogen bonds*

molar mass	18.0151 grams per mole
melting point	0.00 °C
boiling point	100.00 °C
maximum density (at 3.98 °C)	1.0000 grams per cubic centimetre
density (25 °C)	0.99701 grams per cubic centimetre
vapour pressure (25 °C)	23.75 torr
heat of fusion (0 °C)	6.010 kilojoules per mole
heat of vaporization (100 °C)	40.65 kilojoules per mole
heat of formation (25 °C)	−285.85 kilojoules per mole
entropy of vaporization (25 °C)	118.8 joules per °C mole
viscosity	0.8903 centipoise
surface tension (25 °C)	71.97 dynes per centimeter



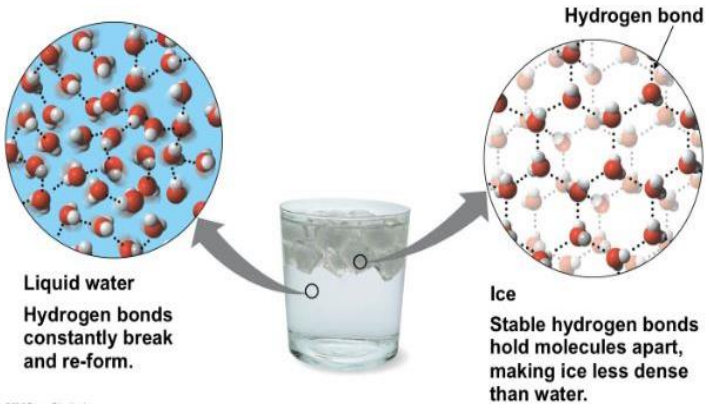


2. *READING COMPREHENSION*

DIFFERENT FORMS OF WATER

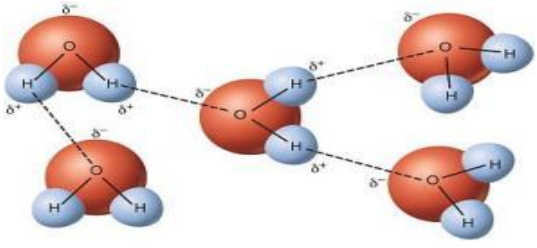
Water is the chemical substance with chemical formula **H_2O**, one molecule of water has two hydrogen atoms covalently bonded to a single oxygen atom. It is hard to not be aware of how important water is in our lives. This simple fact is why scientists are constantly looking for water on other planets - the presence of water could indicate the presence of life. There are three different forms of water, or H_2O: solid (ice), liquid (water), and gas (steam).

Solid State (Ice)



All substances, including water, become less dense when they are heated and denser when they are cooled. So if water is cooled, it becomes denser and forms ice. Water is one of the few substances whose solid state can float on its liquid state! Why? Water continues to become denser until it reaches 4°C. After it reaches this temperature, it becomes less dense. When freezing, molecules within water begin to move around more slowly, making it easier for them to form hydrogen bonds and eventually arrange themselves into an open crystalline, hexagonal structure. Because of this open structure as the water molecules are being held further apart, the volume of water increases about 9%. So molecules are more tightly packed in water's liquid state than its solid state. That is why a can of soda can explode in the freezer.

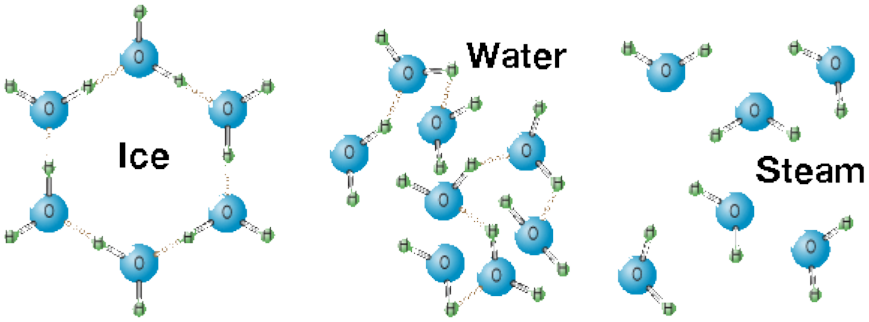
Liquid State (Liquid Water)



It is very rare to find a compound that lacks carbon to be a liquid at standard temperatures and pressures. So it is unusual for water to be a liquid at room temperature! Water is liquid at room temperature so it's able to move around quicker than it is as solid, enabling the molecules to form fewer hydrogen bonds resulting in the molecules being packed more closely together. Each water molecule links to four others creating a tetrahedral arrangement, however they are able to move freely and slide past each other, while ice forms a solid, larger hexagonal structure.

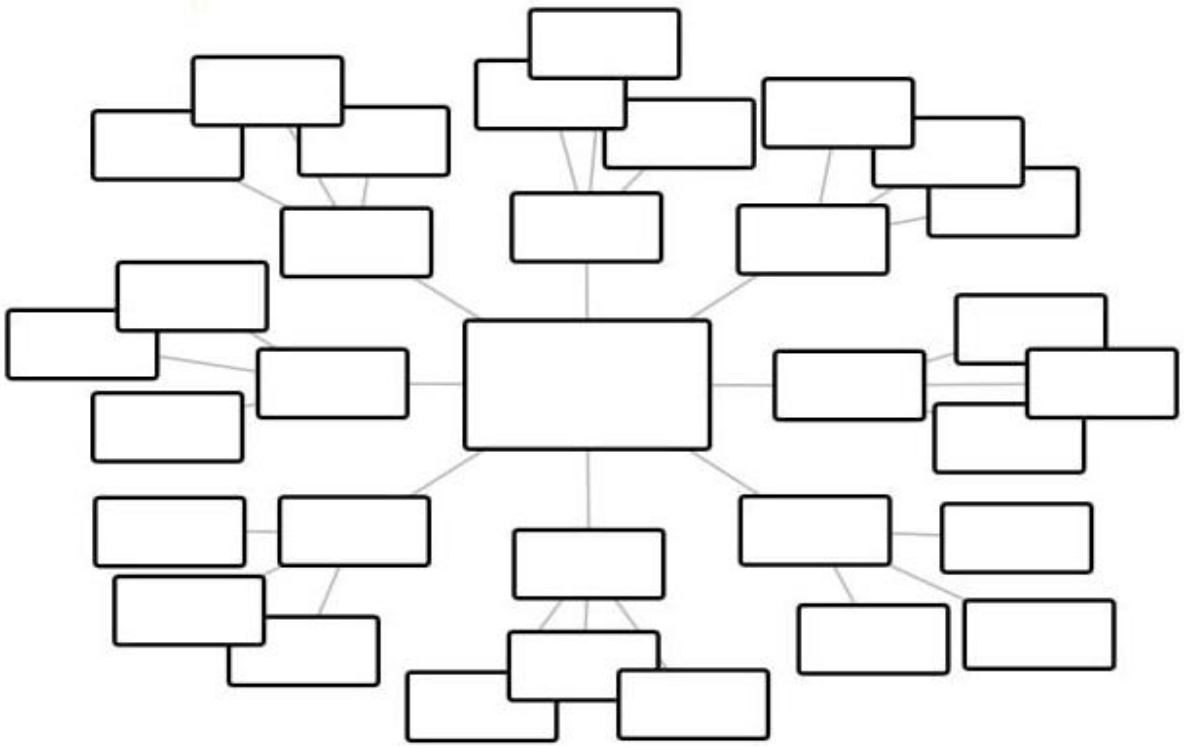
Gas State (Steam)

As water boils, its hydrogen bonds are broken. Steam particles move very far apart and fast, so barely any hydrogen bonds have the time to form. So, less and less hydrogen are present as the particles reach the critical point above steam. The lack of hydrogen bonds explains why steam causes much worse burns than water. Steam contains all the energy used to break the hydrogen bonds in water, so when steam hits your face you first absorb the energy the steam has taken up from breaking the hydrogen bonds in its liquid state. Then, in an exothermic reaction, steam is converted into liquid water and heat is released. This heat adds to the heat of boiling water as the steam condenses on your skin.



Hydrogen bonds are strongest at subzero temperatures when they hold six oxygen atoms in a tight hexagonal molecule of ice. In its liquid form oxygen atoms are loosely linked in chains, whereas at temperature above 100°C, they are separated in steam.

Task01: Use Mind Maps (*Mapping/Brainstorming****) to brainstorm and share anything you know about Different Forms of Water before reading the text.***



Task 02: Make predictions about the text by answering the questions below:

1. Read the title of the text and make predictions about the main idea. What will this text be about?

   ……

   ……

   ……

   ……

2. Now, read the first and last paragraphs. What do you know about the text that you didn't know before?

   .....

   .....

   .....

   .....

   .....

   .....

3. Compare your predictions to the information found in the text (true/false).

   ……

   ……

   ……

Task 03: Answer these questions (from the text)

1. When water is cooled, it forms .....

   a. steam b. liquid water c. vapour d. ice

2. When freezing, water molecules start .....

   a. changing b. disappearing c. rotating d. increasing

3. Hydrogen bonds in boiling water are .....

   a. formed b. closer c. constructed d. Separated

4. Are these statements true/false?

   a. Water is among the substances whose solid state can float on its liquid state.

   b. When heated, substances become denser.

   c. In liquid water, hydrogen bonds never break and re-form.

   d. Hydrogen bonds are tightly linked at temperature above 100°C.

3. *LANGUAGE STUDY*

3.1. Structure and Vocabulary:

Task 01: Fill in each gap with the appropriate preposition (for/to)

Water Uses

15 % of water is consumed **.....** domestic purpose. Water is used **.....** drinking, bathing, cooking food and washing dishes, clothes, fruits, vegetables and brushing teeth.

Agriculture is the largest consumer of water. About 70% of water is used **.....** irrigation. Water is necessary **.....** gardening, farming and fisheries. Plants require water **.....** grow. During the process of photosynthesis, they consume water.

In industry, it is either used in creating or **.....** cool the equipment used **.....** creating the product. Industrial water is used **.....** washing, cooling, processing, transporting, diluting or fabricating a product. The maximum amount of water is used in the production of chemicals, paper and food.

Task 02: link each word to its definition

1. *Covalently bonded*	a. to rest or move on the surface of a liquid without sinking.
2. *Aware*	b. to arrive at; get as far as.
3. *Float*	c. having six straight sides and six angles like a crystal.
4. *Reach*	d. Having knowledge or perception of a situation or fact.
5. *Freeze*	e. involves the sharing of electronic pairs between atoms
6. *Hexagonal*	f. Accompanied by the release of heat
7. *Exothermic*	g. Turn or to be turned into ice

3.2.Hydraulics Terminology

Task 01: Put one word in each gap

space ; coheres ;capillary ; gravity ; tension ; wax; drops; adhesion; bonds; cohesion; stronger; flat; molecules; properties.

Two of water's special properties are **.....** and cohesion. Hydrogen **.....** are responsible for these two **.....**. Adhesion means it sticks well to other materials. It spreads out all over a **.....** surface. **.....** says that water sticks to itself. The adhesive force is **.....** than the cohesive force, so water **.....** will spread out instead of clumping together, on a table, for example.

Molecules at the surface of water are not surrounded by similar molecules, so they stick to those closest to them on the surface. This cohesive force creates surface **.....**. Surface tension makes **.....** of water bead up on a **.....** surface of a car. It makes the drops round so they take up a small amount of **.....**. Surface tension also creates **.....** action. A plant sucks water up which sticks to the sides of the tubes. The surface tension tries to make the water flat. The water then rises and **.....** to itself until **.....** takes over and the water comes down again.

Task 02:

a. Give words (in the field of hydraulics) that should start with the following initials:

T..... F.....

S..... I.....

P..... M.....

A..... W.....

G..... B.....

b. Select four words from those you have given and use them in meaningful sentences of your own.

.....

.....

.....

.....

.....

.....

4. ***WRITING*** *Express it differently*

Task*: *Rewrite each of the sentences below, beginning with the given initials.

a. The presence of water could indicate the presence of life.

- The presence of life .....

b. The lack of hydrogen bonds explains why steam causes much worse burns than water.

- Why steam .....

c. As water boils, its hydrogen bonds are broken.

- Hydrogen .....

d. Molecules at the surface of water are not surrounded by similar molecules.

- Similar molecules .....

e. This cohesive force creates surface tension.

- Surface tension .....

5. ***LISTENING***

Task 01: Listen and complete the text with what you hear.

Industrial Uses of Water

Water is used in **....., ..., ...**, offices, and other commercial **.....**. It is essential in the manufacturing and production of paper, **.....**, automobiles, steel, food, textile production, **.....**, etc. Power plants need a significant amount of water for cooling.

Water is a universal solvent and hence is used to **.....** several compounds in industrial production. It is widely used as a solvent and less commonly used as a catalyst. Water **.....** is also used in several industrial processes. Water is used by smelting facilities and petroleum **.....**.

Industrial uses of water are processing, **.....** or fabricating a product. Rivers, canals, oceans, and seas provide simple means of transportation. There will be less **.....** in the water compared to land transport without any obstacles. It offers economic opportunities with an effective way to transport **.....**.

Water is a source of **.....**. Dams are constructed across rivers and lakes to store water which is converted to electricity using **.....**. Hydroelectricity is a **.....** energy source that is used across the globe. It has reduced the dependence on fossil fuels for energy.

Water is used in the extraction of **.....**, oil, and gases. It is essential for several critical **.....** functions. Along with being a solvent, water is used in a **.....** turbine and heat exchanger.

Task 02: Listen then say whether the statements below are true, false or not mentioned.

a. Groundwater is unsafe. .....

b. Surface water is the only source for agricultural water. .....

c. Illegal disposal of chemicals in water improves its quality. .....

d. Agriculture needs a moderate amount of water. .....

e. Water has to be used efficiently to increase productivity. .....

f. Water has reduced the dependence on fossil fuels for energy. .....

g. Water quality affects food quality. .....

h. Plants use water for photosynthesis. .....

6. FURTHER PRACTICE

6.1. Fill in the gaps below according to the definitions given between brackets. The first letter is provided.

1. The presence of water could **.....** the presence of life. (*show*)

2. There are three **.....** forms of water, or H_2O: solid (ice), liquid (water), and gas (steam). (*distinct*)

3. The specific heat capacity of water is much **.....** than that of other common substances. (*elevated*)

4. The high specific heat of water helps the earth's temperature **.....** moderate since water traps heat during the day and releases it slowly at night. (*stay*)

5. Besides mercury, water has the highest **.....** tension for all liquids. (*the outside part or uppermost layer of something*)

6. Surface tension is the property of the surface of a liquid that allows it to **.....** an external force, due to the cohesive nature of its molecules. (*withstand the action or effect of something*)

7. Vaporization **.....** when a liquid changes to a gas. (*take place*)

8. Viscosity is the **.....** of fluid having high resistance to flow. (*a thing or things belonging to someone*)

9. If water is **.....**, it becomes denser and forms ice. (*become or make less hot*)

10. As water boils, its hydrogen bonds are **.....**. (*separate or cause to separate into pieces as a result of a blow, shock, or strain*)

6.2. Fill in each gap with one of the words given in the box.

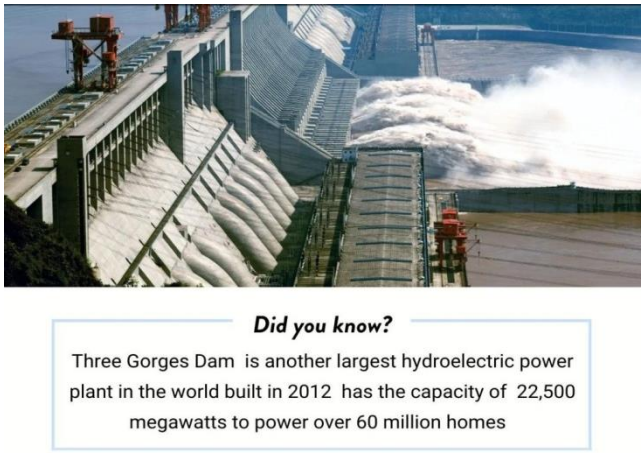
Deeper; frozen; freeze; surface; ecosystems; floats; insulates; living; shields; liquid

During the winter when lakes begin to **.....,** the surface of the water freezes and then moves down toward **.....** water; this explains why people can ice skate on or fall through a **.....** lake. If ice was not able to float, the lake would freeze from the bottom up killing all **.....** living in the lake. However ice **.....**, so the fish are able to survive under the **.....** of the ice during the winter. The surface of ice above a lake also **.....** lakes from the cold temperature outside and **.....** the water beneath it, allowing the lake under the frozen ice to stay **.....** and maintain a temperature adequate for the ecosystems **.....** in the lake to survive.

UNIT III: WATER AS A RENEWABLE ENERGY SOURCE

1. COMMUNICATE

a. Look at these illustrations. What does each illustration represent? (Explain)



b. Watch the video then answer the questions below

Link: https://youtu.be/gcTBEiUTyXE

2. What are some 'renewable' energy sources? Why do we call them this?
3. Are renewable energy sources a relatively new thing?
4. How might a drought affect hydropower?
5. What are some of the benefits of solar energy? What are some of the drawbacks?
6. What is the difference between concentrated solar power and photovoltaics? How do they each work?
7. How can solar energy be used even when it isn't sunny? How can solar energy be stored?
8. What are some organizations doing to increase people's access to renewable energy sources, like solar energy?
9. What is 'geothermal' energy? How can it produce electricity?
10. What are some of the benefits and drawbacks of geothermal energy?
11. What are some other solutions to ensuring there's enough energy to go around besides using new technologies like wind or solar power?
12. Why might we want to use renewable energy sources like solar or wind to power our homes instead of fossil fuels like coal?

2. READING COMPREHENSION:

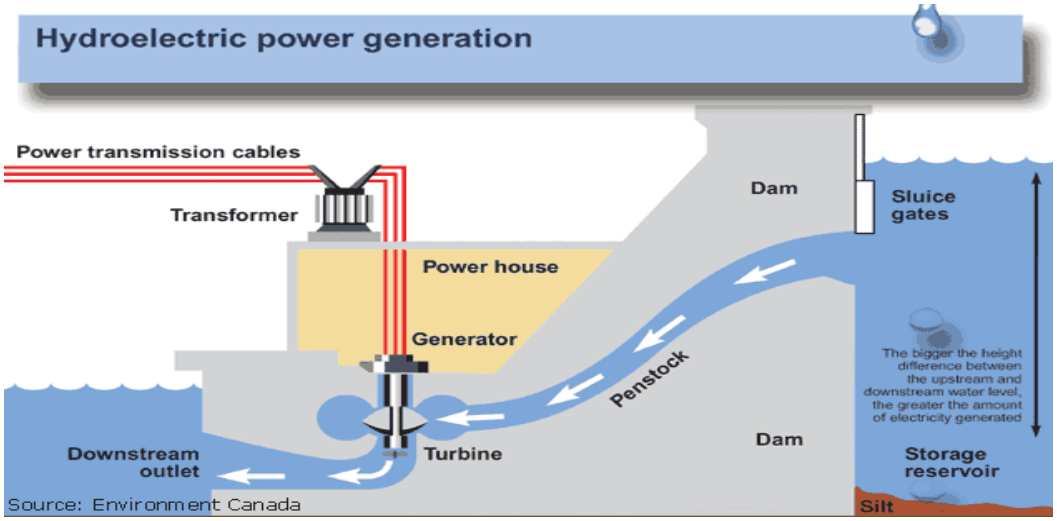
- ***Before reading:*** *Use* ***Mind Maps*** *(Mapping/Brainstorming) to brainstorm and share anything you know about* ***Hydroelectric Energy.***

Hydroelectric Energy: The Power of Running Water

Hydroelectric energy is made by moving water. Hydro comes from the Greek word for water. Hydroelectric energy has been in use for thousands of years. Ancient Romans built turbines, which are wheels turned by flowing water. Roman turbines were not used for electricity, but for grinding grains to make flour and breads. Water mills provide another source of hydroelectric energy. Water mills, which were common until the Industrial Revolution, are large wheels usually located on the banks of moderately flowing rivers. Water mills generate energy that powers such diverse activities as grinding grain, cutting lumber, or creating hot fires to create steel.

To harness energy from flowing water, the water must be controlled. A large reservoir is created, usually by damming a river to create an artificial lake, or reservoir. Water is channeled through tunnels in the dam. The energy of water flowing through the dam's tunnels causes turbines to turn. The turbines make generators move. Generators are machines that produce electricity.

Engineers control the amount of water let through the dam. The process used to control this flow of water is called the intake system. When a lot of energy is needed, most of the tunnels to the turbines are open, and millions of gallons of water flow through them. When less energy is needed, engineers slow down the intake system by closing some of the tunnels.



During floods, the intake system is helped by a spillway. A spillway is a structure that allows water to flow directly into the river or other body of water below the dam, bypassing all tunnels, turbines, and generators. Spillways prevent the dam and the community from being damaged. Spillways, which look like long ramps, are empty and dry most of the time.

Hydroelectric power plants near waterfalls can create huge amounts of energy, too. Water crashing over the fall line is full of energy. A famous example of this is the hydroelectric plant at Niagara Falls, which spans the border between the United States and Canada. Hydroelectric energy generated by Niagara Falls is split between the U.S. state of New York and the Canadian province of Ontario. Engineers at Niagara Falls cannot turn the falls off, but they can severely limit the intake and control the amount of water rushing over the waterfall.

The largest hydroelectric power plant in the world is the enormous Three Gorges Dam, which spans the Yangtze River in China. It is 185 meters (607 feet) tall and 115 meters (377 feet) thick at its base. It has 32 turbines and is able to generate more than two billion watts of power.

Task 01: Have a look at the text! Without reading the whole text, try to raise some questions about: title, arrangement of ideas, key words.

Task 02: considering already mentioned elements of the text, try to provide answers to the following questions:

a. Just from the title, say whether you have any information about the topic or not.
b. Mention some words that you find unfamiliar or new for you.
c. Can you predict the key words of the text from the title, etc? How do these key words interrelate?
d. What do you think will be the upcoming information?
e. Can you predict the writer's arrangement of ideas?
f. What do you think is the author's purpose for writing this text?
g. Who is the intended audience of the author?

Task 03: Choose the best answer for each of the following questions:

1- Which of the following can best reflect the main idea of paragraph one?

a. Identification of hydroelectric energy

b. The process of generating hydroelectric power

c. Early use of water power

2- Which sentence is least relevant to the main idea of paragraph six?

a. The Three Gorges Dam

b. The biggest hydroelectric power plant in the world

c. Recent developments in hydroelectric power uses

3- Which of the following summarizes the main points of the text?

a. First hydroelectric power plant

b. Hydroelectric power: past and present

c. Ancient uses of hydroelectric energy

4- Which of the following statements has no relationship with the topic?

a. Background knowledge to hydroelectric energy

b. Different sources of renewable energies

c. Uses of hydroelectric energy in African countries

5- Which of the statements below expresses fact not opinion?

a. Niagara Falls spans the border between the United States and Canada.

b. Spillways look like long ramps.

c. The Three Gorges Dam is the largest hydroelectric power plant in the world

3. LANGUAGE STUDY

3.1.Structure and vocabulary

Task 04: Building vocabulary (**worksheet 03: Vocabulary Awareness Chart**)

1. Scan the title, subtitles, captions, reading aids, and first and last paragraphs. Identify ten words that seem important (for instance words that are important to the topic, content vocabulary, or key concepts). Once you have identified these words, write them in the "Word" column. Use a dictionary to look up the words you have never met before.

Word	**Definition in your own words**
1.	
2.	

3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

2. Select 5 words and use them in meaningful sentences

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Task 02: Fill in each gap with the appropriate preposition (in/for/of/to)

In recent years, there has been a growing interest ……. small-scale hydroelectric power systems, which can be put …… place …… remote areas or added ….. existing infrastructure. According ……. the International Energy Agency, small-scale hydropower systems with a capacity …… less than 10 megawatts account …… around 10% …… global hydropower capacity.

Small-scale hydro is expected …… keep growing over the next few years, thanks …… things like the growing need ….. renewable energy and the need …… bring electricity …… remote communities.

Task 03: Link each word to its definition

1. *Turbine* a. machine that converts one type of energy to another
2. *Steel* b. machine that captures the energy of a moving fluid
3. *Generator* c. metal made of the elements iron and carbon.
4. *Intake system* d. process engineers use to control the flow of water through a dam.
5. *Potential energy* e. artificial waterway
6. *Canal* f. power or force an object has because of its motion
7. *Kinetic energy* g. force or power of an object as a result of its position in an electric, magnetic, or gravitational field

3.2.Hydraulics Terminology

Task 01: Put one word in each gap

Hikers ; run out ; reservoir ; geothermal ; boaters ; nonrenewable; recreational; evaporates; recycling

Hydroelectricity relies on water, which is a clean, renewable energy source. A renewable source of energy is one that will not **…….** Renewable energy comes from natural sources, like wind, sunlight, rain, tides, and **…….** energy (the heat produced inside Earth). **……..** energy sources include coal, oil, and naturalgas.

Water is renewable because the water cycle is continually **…….** itself. Water **……..**, forms clouds, and then rains down on Earth, starting the cycle again.

Reservoirs created by dams can provide large, safe **……..** space for a community. **……..** and water skiers can enjoy the lake. Many reservoirs are also **……..** with fish. The area around a **…….** is often a protected natural space, allowing campers and **……** to enjoy the natural environment.

Task 02:

a. Give words (in the field of hydraulics) that should start with the following initials:

C..... E.....

D..... I.....

P..... N.....

H..... L.....

R..... O.....

b. Select four words from those you have given and use them in meaningful sentences of your own.

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4. **WRITING** *Adding information to a text*

Added information to a text or extra information is marked with commas or dashes:

, which ……..,

-for example …….. –

, such as ……,

Example:

Seasonal variations in precipitation and long-term changes in precipitation patterns, such as droughts, can have significant effects on the availability of hydropower production.

Task1: Give three sentences using extra information as the example above!

Task 2: Underline additional information in the sentences below:

1. The structure that houses the turbines and generators, and into which the pipes or penstocks feed, is called the powerhouse.

2. In certain coastal areas, such as the Rance River estuary in Brittany, France, hydroelectric power plants have been constructed to take advantage of the rise and fall of tides.
3. Many of the negative environmental impacts of hydroelectric power come from the associated dams, which can interrupt the migrations of spawning fish, such as salmon, and permanently submerge or displace ecological and human communities as the reservoirs fill.
4. An underground power station is generally used at large facilities and makes use of a large natural height difference between two waterways, such as a waterfall or mountain lake.
5. Falling water causes turbines to rotate, which drives generators that convert the mechanical energy of the turbines into electricity.
6. Hydroelectric energy is simply electrical energy that is produced from hydropower – the force created by running water.

5. LISTENING

Task 01: Listen and complete the text with what you hear.

Despite being the largest renewable source of **……**, hydropower does have its **……..** The most significant one is its damage to the surrounding environment and **……..** Most hydroelectric power plants require the construction of a **……**, which would result in the destruction and **……** of the surrounding habitats. For example, the construction of water dams may affect the migration and movement of **…….** organisms, hinder their reproduction, and in some extreme cases, some **……** may become extinct. Additionally, as most hydroelectric projects are physically large in size, it could often lead to the **……..** of massive areas within a river valley.

As the effects of **……..** change continue to become more **……**, some regions are experiencing less **……** while others are expecting far more **……..** and extreme **……..** conditions. Changing or even **……** water cycles in turn impacts power plants' ability to **……..** power and electricity.

For instance, the recent historic low water **……..** in Lake Powell, an important water body in the US and a major reservoir on the Colorado River, has **…….** the water availability for the 40 million people and dozens of **……** that depend on the River for **…….** water. In other words, while hydropower is less affected by day-to-day weather, it is certainly **……** by climate change.

Rising **……** due to limited remaining **…….** sites and extra **……** in addressing social and **…….** impacts is making hydropower less popular, therefore a **……..** overall growth across the world.

6. *FURTHER PRACTICE:*

6.1.Fill in the gaps below according to the definitions given between brackets. The first letter is provided.

The hydro industry has a rich history, dating back thousands of years to the early **u**…….. of water power. (utilization)

2. Water power was first used in ancient civilizations such as Greece, Rome, and China, where it was **p**……. used for irrigation and milling grain. (*mainly*)

3. In these early applications, water was used to **p**…… simple machines such as waterwheels to grind grain or pump water. (*to supply*)

4. In the Middle Ages, **w**…… were used for a variety of purposes, including sawing wood, grinding grain, and powering bellows for blacksmiths. (*a large wheel driven by flowing water, used to work machinery or to raise water to a higher level*)

5. During the Industrial Revolution, water power became even more important as it was used to power machines in textile mills and other **f**……... (*plants*)

6. In the late 1800s and early 1900s, hydroelectric power began to **e**……. as a viable source of electricity. (*to come out*)

7. The first hydroelectric power plant was **b**…… in Appleton, Wisconsin, in 1882. (*constructed*)

8. The plant used a water turbine to ……. electricity, which was then used to power lights in a paper mill. (*to produce*)

9. As hydroelectric power became more popular, l……. dams and hydroelectric plants were built. (*greater*)

10. In 1935, the Hoover Dam was **c**……. on the Colorado River, producing 1,345 megawatts of electricity. (*accomplished*)

6.2. Fill in each gap with one of the words given in the box.

innovative; largest; harness; capacity; fascinating; ways; industry; turbines; energy; tidal; generate

Today, the Three Gorges Dam in China is the **……** hydroelectric power plant in the world, with a **……** of 22,500 megawatts.

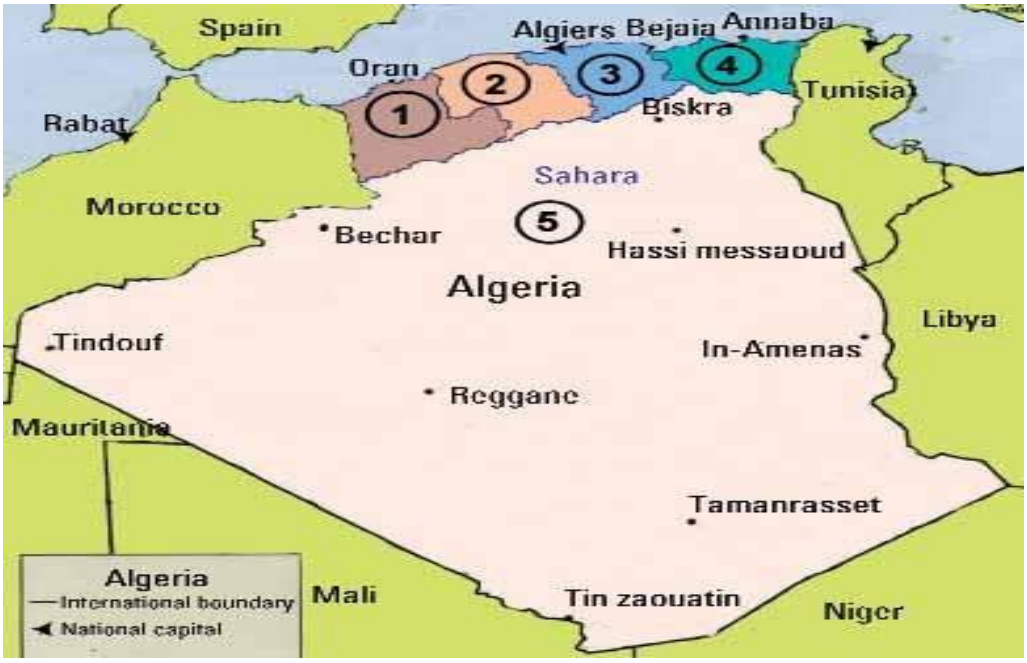
In addition to hydroelectric power, there are other **……** that water power is used. For example, water **…….** are used to generate power in **……** power plants, which use the movement of ocean tides to **…….** electricity. Another example is wave power, which uses the **……** of ocean waves to generate electricity.

In conclusion, the history of the hydro **…….** is a long and **…….** one, dating back thousands of years to the early use of water power. Today, hydroelectric power is a major source of electricity worldwide, and new technologies are being developed to **…….** the power of water in even more **……** ways.

UNIT IV: DAMS

1. COMMUNICATE

Look at these illustrations. What does each illustration represent? (Explain)



Distribution of hydrographic basins in Algeria

Beni Haroun Dam (Algeria)

b. Watch the video in the link below. What have you understood?

Link: https://youtube.com/shorts/KYlBuB5Hlng?si=MI5bScDga_r3ZiMP

2. READING COMPREHENSION:

- ***Before reading:*** *Use* ***Mind Maps*** *(Mapping/Brainstorming) to brainstorm and share anything you know about* ***Dams.***

DAMS IN ALGERIA

The construction of dams to exploit runoff became a major concern throughout the 19th century in Algeria. The first dam built in Algeria was Meurad, constructed in 1861. Other dams were built during the period 1846-1885. However, these experienced a number of design problems, because the necessary engineering techniques had not yet been fully mastered. From 1930, dams with larger capacities began to be constructed.

The 11 large dams built before 1962 (the year of Algeria's independence) had an initial capacity of about 1 $\times 10^9$ m^3 and regulated an annual volume estimated at about 600 $\times 10^6$ m^3. It is noteworthy that by 1962, silting of reservoirs had affected 20 per cent of the total storage capacity, which totaled about 200 $\times 10^6$ m^3.

Since 1962, a further 54 dams with a capacity of at least 10 $\times 10^6$ m^3 each were constructed, increasing the total storage capacity of dams in Algeria to about 8 $\times 10^9$ m^3.

Table 2: Classification of dams in terms of capacity

Capacity ($10^6 m^3$)	Number of	Total capacity ($10^6 m^3$)
>500	2	1610
500 > V > 250	4	1360
250 > V > 200	4	889
200 > V > 100	16	2278
100 > V > 80	4	342.1
80 > V > 60	6	425.1
60 > V > 40	11	535.5
40 > V > 20	8	229.5
V < 20	10	107.3
Total	65	7776.5

The Algerian dams are of average capacity, the largest being: Beni Haroun, with a capacity of 960 $\times 10^6$ m^3, Koudiat Acerdoune (650 $\times 10^6$ m^3), Gargar (450 $\times 10^6$ m^3) and Djorf Torba (350 $\times 10^6$ m^3). Experts have stressed that the hydrological conditions of Algeria do not allow for dams of very large capacities. To reduce the deficit of water storage, the Algerian Government foresees the construction of 110 more dams in the future.

Of the total of 65 large dams in operation, the break- down of types is as follows: 42 are earthfill, 8 are rockfill, 5 are concrete gravity, 2 are arch, 4 are multi-arch, 3 are RCC dams, and 1 is masonry.

In terms of water resources, Algeria is among the poorest countries of Africa and the world. Therefore, one of the constant preoccupations of the relevant authorities is to try to resolve the delicate balance between maintaining water resources and meeting water needs. To reach a satisfactory level of security in water supply, it would be necessary to

reach between 15 and 20×10^9 m^3 of storage per year by 2025. This is a major challenge, considering currently only 7×10^9 m^3 is developed each year. Another challenge is that major erosion which affects the northern plains is decreasing both the agricultural potential of the country and the capacity of water resources that can be mobilized.

Task 01: Make predictions about the text by answering the questions below:

7. Read the title of the text and make predictions about the main idea. What will this text be about?

   ……
   ……
   ……
   ……

8. Now, read the first and last paragraphs. What do you know about the text that you didn't know before?

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   .....

9. Compare your predictions to the information found in the text (true/false).

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Task 2: Try to annotate the first paragraph of text 01 following the steps provided in the lesson. You can use your own symbols but you have to remember the key to your annotation (what every symbol means).

Task 3: Are the statements below true/false or not mentioned?

1. Algeria is among the richest countries in water resources. .....
2. Algeria has very large capacity dams. .....
3. It wasn't until independence that Algeria was able to build dams. .....
4. Dams in Algeria are used for hydropower production. .....
5. Constructing large capacity dams is the primary concern of Algeria. .....
6. There exist five types of dams in Algeria. .....
7. Concrete gravity dams are the most useful in Algeria. .....

3. LANGUAGE STUDY:

2.1.Structure and Vocabulary:

Task 01: Fill in each gap with the appropriate preposition (in/of/for)

Dams are said to be an important source **…….** water supply and **……** high importance **……..** various other reasons. They supply the water **……..** various means including domestic use, irrigation purposes and also **…….** industrial uses.

Dams are also involved **……..** hydroelectric power generation and **…….** river navigation. The application **…….** these dams is much more important **……** daily activities including cooking, cleaning, bathing, washing, drinking water, **……** gardening and **……** cultivation purpose.

The big dams and the reservoirs also provide recreational areas **…….** the purpose **…….** fishing and also boating. They also cater insecurity needs **…….** humans by reducing or preventing floods. During the times **…….** excess flow **……** water, the dams store the water **……...** the reservoir; later they release that water during the times **…….** low flow, also when the natural flows **…….** water are inadequate to meet the demand. When engineers design and also maintain the dams, they are keenly expected to make sure to keep all purposes …….. their mind.

Task 02: Choose the best answer among A, B, and C to replace the word in bold in each sentence.

1. Life cycles of habitats living in the water (like fish) get affected **due to** the construction of dams.

a. because of b. since c. as

2. Their life cycles are **adapted** to natural river habitat and flow regimes.
   a. Adopted b. conformed c. changed
3. By **altering** the flow, the physical surroundings are altered.
   a. ameliorating b. modifying c. stopping
4. Cycles and **variation** of flow downstream are established.
   a. similarity b. quantity c. change
5. Standing water (reservoir) habitats replace flowing water habitats.
   a. fresh b. moving c. stagnant
6. Coastal erosion is **enhanced** because of the loss of debris transportation.
   a. slowed b. increased c. moved
7. Productivity and species **diversity** of waterways are often reduced because of the reduction of fresh flow.
   a. progress b. amount c. variety
8. A reduction in diversity **happens**.
   a. occurs b. increases c. starts

2.2.Hydraulics Terminology:

Task 01: Put one word in each gap

Excavated; materials; dumped; compacted; core; cross-section; asphaltic; bank; clayey; impermeable; water; pressure; permeable; soils; valleys; concrete;

Embankment dams are made mainly from natural …….. The two main types are earthfill dams and rockfill dams. Earthfill dams are made up mostly from …….. earth, while rockfill dams are made up mainly from …… and compacted rockfill. The materials are usually …….. or quarried from nearby sites, preferably within the reservoir basin.

A …….. (or slice) through an embankment dam shows that it is shaped like a ……., or hill. Most embankment dams have a central section, called the core, made from an …….. material to stop …… passing through the dam. …….. soils, concrete or ……. concrete can be used for the ……..

Rockfill dams are **……..** They can have a core or an impermeable cover on the upstream face. Materials used for the cover include reinforced **……..** and asphaltic concrete. Embankment dams are usually chosen for sites with wide **……..** They can be built on hard rock or softer **……..,** as they do not exert too much **……** on their foundations.

Task 02: Define the following terms in your own words.

1. Reservoire:

   ……
   ……
   ……

2. Earthfill dams:

   ……
   ……
   ……

3. Clyey soils:

   ……
   ……
   ……

4. ***WRITING*** *Describing process*

Try to order the steps necessary in dam construction provided below, then add more information to each step.

- **Assemble the main structure**
- **Preparing the dam's foundation**
- **Filling the reservoir**
- **Diverting the water**

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5. LISTENING

Task 01: Listen and complete the text with what you hear

Common Types of Dams

ARCH DAM

An arch dam is a concrete dam **…….** into the shape of an arch. The curved part points back to the water. When **…….** from the water presses against the arch, the water pressure makes it **…….** slightly, thus strengthening the structure as it pushes back its foundations and **…….**. We classify arch dams into **……..** radius dam, variable radius dam, and constant **…….** dam.

DETENTION DAM

The primary purpose of a detention dam is to regulate the flow **…….** and minimize flood impact in a water channel. Sometimes detention dams are also constructed to **……** groundwater systems or trap **…….**. Detention dams store water for extended periods for irrigation, **……..**, hydroelectricity, municipal water supply, and **……..** In flood-prone areas, detention dams are built in areas higher than the flood area. The water collects in the basin above and is slowly **……** at a rate the flood zones and channels can **……..**.

EMBANKMENT DAM

An embankment dam is constructed from **……** construction materials or industrial wastes. The materials are then **……** to form a wall with **……** soil compositions. The dam is semi-impervious, and this prevents **……** erosion. The interaction and **……** of materials bind the **……..** together, making a **……..** mass.

Embankment dams are classified into an **……..** dam and a **……..** dam. The core of embankment dams is filled with an **……..** material such as clay or concrete to prevent water from seeping **……**. Embankment dams are a good choice, especially for sites with broad **……...**

GRAVITY DAM

A gravity dam is a **……** dam made from concrete or **……..** designed to resist water **……** from its self-weight. Each gravity dam section is stable and independent of other dam **……**. These dams need **……** foundations with high bearing **……..** to limit the resultant force from the water. It is best to test the bearing capacity of the soil on which the foundation rests to **……** it can support the weight of the dam and the water.

STORAGE DAM

Storage dams are constructed to **……..** and store water, especially during **……** seasons, for use by **……..** during the dry season. We also use storage dams for **……** water supply, hydroelectricity, and irrigation.

6. FURTHER PRACTICE

6.1. Fill in the gaps below according to the definitions given between brackets. The first letter is provided.

1. Dams are built to provide water for human **……..**, for irrigating arid and semiarid lands, or for use in industrial processes. (the action of using up a resource)
2. Dams are used to increase the **……..**of water available for generating hydroelectric power. (a quantity of something)

3. They are also used to reduce peak discharge of **……..** created by large storms or heavy snowmelt. (water left by flooding)
4. Dams can also provide a lake for **……..** activities such as swimming, boating, and fishing. (relating to or denoting activity done for enjoyment when one is not working)
5. Many dams are built for more than one purpose; for example, water in a single **……..** can be used for fishing, to generate hydroelectric power, and to support an irrigation system. (a large natural or artificial lake used as a source of water supply)
6. Water-control structures of this type are often **……** multipurpose dams. (nominated)
7. Auxiliary works that can help a dam function properly include **……..**, movable gates, and valves that control the release of surplus water downstream from the dam. (a passage for surplus water from a dam)
8. Dams can also include intake structures that deliver water to a power station or to canals, **……**, or pipelines designed to convey the water stored by the dam to far-distant places. (an artificial underground passage, especially one built through a hill or under a building, road, or river)
9. Other auxiliary works are systems for **……** or flushing out silt that accumulates in the reservoir. (remove air, water, or other contents from a container)
10. Multipurpose dams can hold special importance in developing countries, where a single dam may bring significant benefits related to hydroelectric power production, agricultural development, and industrial **……..** (progress)

6.2.Fill in each gap with one of the words given in the box.

Irrigate; hold back; farmers; materials; Jordan; builders; oldest; clay; Mesopotamians; concrete; flooding; Manmade; activities; reservoirs; boating; houshold

A dam is a structure built across a river or stream to **……** water. People have used different **……** to build dams over the centuries. Ancient dam **……** used natural materials such as rocks or **……**. Modern-day dam builders often use **……..**.

…….. dams create artificial lakes called **……...** Reservoirs can be used to store water for farming, industry, and **……** use. They also can be used for fishing, **……..**, and other leisure **……**. People have used dams for many centuries to help prevent **……..**

The ancient **……** may have been some of the first humans to build dams. The **……** known dam is the Jawa Dam, located in present-day **……...** It was built in the fourth century B.C.E. Dams provided **……** with a steady source of water to **…….** crops.

UNIT V : CLIMATE CHANGE

1. COMMUNICATE

a. Look at these illustrations. What does each illustration represent? (Explain)

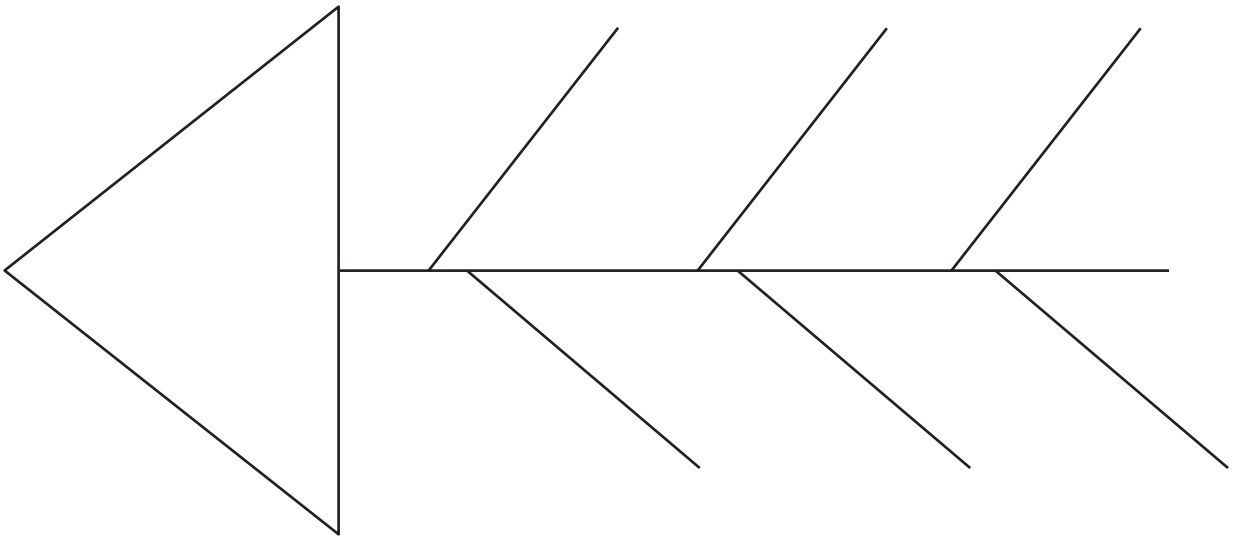
b. Watch the video then answer the questions below:
Link: https://youtu.be/dcCjer_RQ9E

1. What kinds of data do scientists collect in order to study Earth's climate?
2. How do clouds connect to climate change?
3. How does soil connect to climate change?
4. What data does the featured soil scientist collect and analyze data?
5. What data does the featured cloud scientist collect and analyze data?
6. How does the scientist who studies Earth's surface temperature collect data?
7. What accounts for uncertainties in climate data?
8. Why have we been underestimating warming of the ocean over the last 15 years or so?
9. How can we decrease or minimize uncertainties in data?
10. Do uncertainties in climate data mean that we are unsure the climate is changing?

2. READING COMPREHENSION

- ***Before reading: Use the fishbone diagram below to brainstorm ideas about climate change. Write "climate change" in the head of the fish under effect. Then, brainstorm possible causes of this phenomenon filling in the rest of the diagram:***

Effect **Possible causes**



- ***Y****ou are going to read four short pieces of news about the effects of climate change in different parts of the world. For questions 1 – 4 choose from text A – D. The texts may be chosen more than once. Underline or use your highlighter to indicate where in the text you found the answer.*

Passage A:

INUIT COMMUNITY, CANADA

For the people of Rigolet, a former trading post that is the southernmost Inuit community in Canada, the vanishing ice and increasingly unpredictable seasons means they are being forced to adapt in ways they never have before.

Like generations of Inuit before him, Derrick Pottle is a trapper and hunter. His diet of wild game, salmon, berries, trout and seal would have been familiar to his ancestors who were living in Hamilton Inlet around 8,000 years ago.

But Pottle worries all the skills he's learned from older generations may soon become irrelevant. More and more, Inuit are relying on expensive, store-bought processed foods because it's safer and easier than catching or shooting supper.

Pottle's ancestors never experienced a time when their frozen world in northern Labrador was being altered so dramatically because of climate change. Shrinking ice packs and more severe weather has made travel increasingly difficult and dangerous, often cutting people off from other communities and traditional hunting lands.

Some changes are more subtle. Summers have always been short here, and marked by tormenting swarms of black flies. But Paula McLean-Sheppard, a Nunatsiavut government employee, said she has been startled to see the insects arriving earlier and earlier in the spring. Rigolet's fishermen say new species are arriving in the bay, from cormorants to sharks to sea turtles, chasing warming waters and the food that comes with them. Seals, a key source of food and hides for waterproof clothes, are moving further and further up the bay as the sea ice vanishes. Others blame the decline of the region's caribou herd on the changing climate, too.

Some of the changes are harder to see. McLean-Sheppard worries that as coastal Labrador's sea ice becomes increasingly unreliable, it's causing more anxiety among Inuit who feel stuck and unable to travel to catch their food.

Passage B:

ETHIOPIA & SOMALIA

Three times a day, Sara Saban walks under the burning sun to fetch water for her family. Close to her village in the centre of Ethiopia's Somali Region, women, children and men line up in front of the only available well within walking distance. Their donkeys patiently wait as they fill their yellow jerry cans with water. A few

meters away, others dig a hole in the dried-out riverbed to collect what little murky water they can find.

"The underground water is very limited because we are facing a drought," Sara, a mother of ten, told DW. "The water quality is also very bad, so sometimes we suffer from stomach-related illnesses."

The Somali Region has suffered from chronic drought for several years, with the worst stretch recorded in 2016, from which many households have yet to recover. This year the short rainy season known as the 'belg', which typically lasts from March to May, once again failed to provide much-anticipated ground water. The livestock have already started to die.

This has had catastrophic consequences for the pastoral communities, which make up the majority of the Somali population. They rely on cattle and other farm animals for their livelihood: selling them at the market,drinking their milk and eating their meat.

Since the beginning of the year, Sara lost one cow, 20 goats and five sheep. "It rained for only five days, and they were very small showers, so the grass did not grow enough to feed the livestock," she explains. "Cattle are the most vulnerable to drought, followed by sheep and goats," says Ahmed Mohammed, FAO's Somali Region field coordinator. "If we don't protect the core breeding animals at this stage of the drought, this will lead to mass mortality of animals and the families will be stripped of their livelihood assets. Rebuilding these lost livelihoods later on will be an enormous task, so it is less expensive and more efficient to protect and save livelihoods before they are lost."

Passage C:

COLOMBIA & VENEZUELA

The Wayuu people are the largest indigenous tribe in northern Colombia and northwest Venezuela. In Colombia, they live in the La Guajira region. Their home area is comprised of 20,000 km and is rich in salt and petroleum deposits. Families often earn a living from harvesting salt and extracting petroleum, but their main sources of income are cattle ranching and fishing, which makes them particularly vulnerable to the effects of climate change.

Recently, in La Guajira, there have been severe water shortages, which have been exacerbated by a lack of rain for three years. Over the past few years, this drought has caused over 20,000 of the region's cattle to die. For water, many of the Wayuu communities rely on the Ranchería River, one of the longest rivers in La Guajira. Without this water, their struggle to survive becomes increasingly strained.

In addition to suffering from the effects of climate change, the Wayuu must compete for water with the continent's largest open-pit coal mine. In 2006, the construction of

El Cercado dam started. The dam was designed to stop the flow of the Ranchería River and to create a reservoir that would provide nine communiti es with improved access to water. After the dam was completed, however, it became clear that while the reservoir would supply the mine, the Wayuu communities would be unable to access water from either the reservoir or the river, which would leave them worse off than they had originally been.

Passage D:

SOUTHEAST AND CENTRAL ASIA

Much of Asia may see 50% more rainfall due to climate change, although countries like Pakistan and Afghanistan may experience a decline in rainfall by 20-50%, says a new report by the Asian Development Bank (ADB) and the Potsdam Institute for Climate Impact Research.

The increase in rainfall is not necessarily good news either, because the Intergovernmental Panel on Climate Change has forecast fewer rainy days, but more intense rainfall on those days. This means more flooding, and less rainwater eventually percolating underground to recharge aquifers.

And there will probably be more intense typhoons and cyclones as global temperatures go up, says the ADB report, called **A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific**.

Coastal and low-lying areas in Asia will be at an increased risk of flooding. Nineteen of the 25 cities most exposed to a one-metre sea-level rise are in Asia, seven in the Philippines alone. Indonesia will be the country worst hit by coastal flooding, with approximately 5.9 million people affected every year until 2100.

All this will have serious economic consequences. Global flood losses are expected to increase to USD 52 billion per year by 2050 from USD 6 billion in 2005.

Climate change will also make food production in the region more difficult and production costs higher. In some countries of Southeast Asia, rice yields could decline by up to 50% by 2100 if no adaptation efforts are made. Meanwhile, in Central Asia, almost all crop yields in Uzbekistan are projected to decrease by 20-50% by 2050 even in a two-degree Celsius temperature increase scenario.

Marine ecosystems, particularly in the Western Pacific, will be in serious danger by 2100. All coral reef systems in the region will collapse due to mass coral bleaching if

global warming proceeds as per the *statusquo*.

Questions:

Which text: (*justify by referring back to what the text says*)

1. mentions the drawbacks of an increase in rainfall?

   ……
   ……
   ……
   ……

2. describes differences in how water shortage affects animal species?

   ……
   ……
   ……
   ……

3. mentions the loss of traditional abilities as a consequence of climatechange?

   ……
   ……
   ……

4. blames climate change and human action for the problems affecting the local community?

   ……
   ……
   ……
   ……
   ……

3. LANGUAGE STUDY

6.2.Structure and Vocabulary:

Task 01: Fill in the gaps

A village of about 650 people in Alaska **(1)……**to move away to a new location. The village, called Shishmaref, is on **(2)……..**, and the island is getting smaller and smaller. The island is getting smaller **(3)……..**the sea temperature is getting warmer and ice is melting. Every year, the sea is closer to the houses in

Shishmaref, and the people there **(4)……..…….**afraid that **(5)……..…..**houses will soon fall into the water. In fact, some people say that the island will be gone **(6) ……**only 20 years. Shishmaref is **(7)……..**special, however. There **(8)…….**many other islands in the world that may disappear under the water because of rising sea levels. For example, the island nation of Kiribati wants to **(9) ……..**land in another country (Fiji) so that the 100,000 Kiribati people will **(10) ……..**a place to live when their island is under water. Most of the people of Shishmaref want to leave, but **(11)……**can they leave? It will cost millions of dollars to move the village to a new, safer location, but, unfortunately, Shishmaref is a poor village with not **(12)……**money.

1.	**5.**	**9.**
(A) want	(A) they're	(A) buy
(B) wants	(B) there	(B) bought
(C) wanting	(C) their	(C) buying
2.	**6.**	**10.**
(A) a small island	(A) at	(A) has
(B) small island	(B) in	(B) have
(C) the small island	(C) on	(C) had
3.	**7.**	**11.**
(A) because	(A) none	(A) what
(B) so	(B) no	(B) when
(C) however	(C) not	(C) who
4.	**8.**	**12.**
(A) are	(A) be	(A) must
(B) do	(B) have	(B) many
(C) is	(C) are	(C) much

Task 02: Put each term in the box next to its definition below:

climate change; greenhouse gases; electrical appliances; carbon dioxide; atmosphere; emissions; extinction; ecosystems; global warming; rise; greenhouse effect

4. The process in which gases in the atmosphere trap the sun's heat. ……
5. The types of gases that trap the sun's warmth in the atmosphere. ……..
6. A greenhouse gas with the chemical name CO2. ……..
7. A change in the earth's climate over a period of time……

8. When the average temperature on Earth is getting hotter. …….
9. A verb or noun which is a synonym of increase. …….
10. The scientific word for ‘air’. ……..
11. Greenhouse gases caused by human activity. ……..
12. A system of plants and animals living together. ……..
13. When a type of plant or animal disappears completely. ……..
14. Televisions, fridges and other electrical goods. …….

6.3.Hydraulic Terminology:

Question: *What is the difference between weather and climate?*

Task 01: Complete the 15 sentences below with words from the box.

adapt ; climate crisis ; cut back ; desertification; drought ; extinct; floods; forest fires; fossil fuels; warming; greenhouse gas; ice age; melting; pollution

1. A …… is a long period of time without rainfall.
2. ……..happens when the earth’s temperature begins to rise.
3. Too much sudden rainfall can cause …… along rivers.
4. Island nations (such as Kiribati) are very concerned about rise in …….
5. Many animals are becoming …….
6. Carbon dioxide is a …….that is responsible for much of the change in climate.
7. Cars and factories produce a lot of air …….
8. Coal, oil and gas are all examples of ……
9. Perhaps it is time for us to …….on things such as fossil fuels, plastics and meat.
10. The ice caps at the North and South Poles are …….. at an alarming rate.
11. Droughts can cause …… which may also burn down homes and create lots of smoke.
12. Climate change is widely considered to be an urgent problem facing us all. It is a ……
13. A lack of water in some countries is causing deserts to become larger. This is known as ……
14. An …….is the opposite of global warming.

15. Countries, people and animals must quickly learn to ……..to a changing world.

4. WRITING:

Task 01: What can ordinary people do in their day-to-day lives to help stop climate change? Write a short paragraph below.

……
……
……
……
……
……
……
……
……
……
……

5. LISTENING:

Task: Listen carefully then respond to the statements below.

- ***The article says that...***

1. there was an ice age 5 million years ago. **TRUE/FALSE**

2. scientists know nothing about the weather before 1800. **TRUE/FALSE**

3. the weather in 1880 was very hot. **TRUE/FALSE**

4. the hottest July ever recorded was in 2021. **TRUE/FALSE**

5. the yearsfollowing2005havebeenveryhot.**TRUE/FALSE**

6. many countries experienced hot weather in 2021, but not Canada. **TRUE/FALSE**

7. melting ice caused cities to flood thousands of years ago. **TRUE/FALSE**

8. melting ice will possibly cause cities to flood in the future. **TRUE/FALSE**

9. people are probably responsible for the climate change happening now. **TRUE/FALSE**

10. people should try to stop climate change within the next 100 years. **TRUE/FALSE**

6.FURTHER PRACTICE

6.1.Fill in the gaps below according to the definitions or synonyms given between brackets. The first letter is provided.

1. Climate change refers to long-term **s……** in temperatures and weather patterns. (*a slight change in position, direction, or tendency)*
2. Such shifts can be natural, due to changes in the sun's activity or large volcanic **e……..** (*explosion*)
3. But since the 1800s, human activities have been the main **d……** of climate change. (*a factor which causes a particular phenomenon to happen or develop)*
4. Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, **t……..** the sun's heat and raising temperatures. (*catching*)
5. The main greenhouse gases that are causing climate change **i……** carbon dioxide and methane. (*contain*)
6. These come from using gasoline for driving a car or coal for **h……** a building, for example. (*make or become hot or warm*)
7. Clearing land and cutting down forests can also **r…….** carbon dioxide. (*allow something to flow freely)*
8. Agriculture, oil and gas operations are **m……..** sources of methane emissions. (*important, serious, or significant*)
9. Energy, industry, transport, buildings, agriculture and land use are among the main sectors **c……..** greenhouse gases. (*bring about*)
10. Climate change can affect our health, ability to grow food, housing, **s……..** and work. (*the condition of being protected from or unlikely to cause danger, risk, or injury)*

6.2.Fill in each gap with one of the words given in the box.

area; virtually; system; warming; beginning; average; temperatures; warmer; previous; decade

Climate scientists have showed that humans are responsible for **……..** all global heating over the last 200 years. Human activities are causing greenhouse gases that are **……..** the world faster than at any time in at least the last two thousand years. The **……..** temperature of the Earth's surface is now about 1.1°C **…….** than it was in the late 1800s (before the industrial revolution) and warmer than at any time in the last 100,000 years. The last **……..** (2011-2020) was the warmest on record, and each of the last four decades has been warmer than any **…….** decade since 1850.

Many people think climate change mainly means warmer **……**. But temperature rise is only the **……..** of the story. Because the Earth is a **……**, where everything is connected, changes in one **…….** can influence changes in all others.

GRAMMAR: TENSE RULES

The following table provides a concise summary of the 12 main types of grammar tense rules. It should be noted that the table below utilises abbreviations in order to maintain concision. The abbreviations used are "V1 = first form of the verb | V2 = second form of the verb| V3 = third form of the verb"

Tenses	**Tenses Rule**
Past Simple Tense	Subject + V2 + Object
Past Perfect Tense	Subject + had + V3 + Object
Past Continuous Tense	Subject + was + V1 + ing + Object (Singular) Subject + were + V1 + ing + Object (Plural)
Past Perfect Continuous Tense	Subject + had been + V1 + ing + Object
Present Simple Tense Rule or Present Indefinite Tense rule	Subject + V1 + s/es + Object (Singular) Subject + V1 + Object (Plural)
Present Perfect Tense	Subject + has + V3 + Object (Singular) Subject + have + V3 + Object (Plural)
Present Continuous Tense	Subject + is/am/are + V1 + ing + object
Present Perfect Continuous Tense	Subject + has been + V1 + ing + Object (Singular)Subject + have been + V1 + ing + Object (Plural)
Future Simple Tense	Subject + will/shall + V1 + Object
Future Perfect Tense	Subject + will have/shall have + V3 + Object
Future Continuous Tense	Subject + will be/shall be + ing + V1 + Object
Future Perfect Continuous Tense	Subject + will have been + V1 + ing + Object

ANSWER KEY

Unit I

Task 01:

1. Looking for specific information
2. Revising for an exam/test
3. Finding out how to do something
4. Choosing the best chapter to read
5. Finding a job
6. Knowing more about a given topic
7. Doing research

Task 02:

1. c
2. d
3. f/t/f/f
4. t/f

Task 03:

- of /in /of /in /of /of /in / of/ in /of /of / in / with /on / in / in / in /in / of / of / in/on/ of /of / on/of .

Task 04:

- b; d; c; a; a; c

Task 05:

- Environmental/ fluid /technical / infrastructure / sewerage / flow/fluid dynamics/ surroundings/computational/simulations/storm

Task 06:

- Geographical/topographical/equipment/labour/supervise/site/carried out/ designing/ subordinate/ specifications/safety/measures/technical/issues/reports/ proposals

Task 07:

1. stationary
2. deals
3. fluid
4. properties
5. force

6. Hydroelectric-power
7. preserving
8. vital
9. application

Task 08

engineer; liquids; sewage; hydraulics; dams; canals; machinery; qualifications; field.

Unit II

Task 01:

- ice/ rotating/ separated
- True/ false/ false/ false

Task 02:

- For/ for/ for/ for/ to/ to/ for/ for

Task 03:

a. (e)
b. (d)
c. (a)
d. (b)
e. (g)
f. (c)
g. (f)

Task 04:

- adhesion / bonds / flat / Cohesion / stronger / molecules / tension/ drops /wax / space / capillary / coheres / gravity

***Task05*:**

- The presence of life **could be indicated** ...
- Why steam .... **is explained** by the lack of hydrogen.
- Hydrogen bonds are broken **because of** boiling water.
- Similar molecules **do not surround** molecules at the surface of water.
- Surface tension **is created** by ...

Task 06:

- Hotels/ motels/ restaurants/ facilities/ chemicals/ dying/ dissolve/ vapour/ refineries/ diluting / friction / cargo/ hydroelectricity/ turbines/ renewable/ minerals/ mining / steam

Task 07:

- Indicate/ different/ higher/ remain/ Surface tension**/** occurs/ Viscosity/ property/ cooled/ broken

Task 08:

- Freeze/ deeper/ frozen/ ecosystems / floats/ surface/ shields/ insulates/ liquid/ living

Unit III

Task 01:

- c/ c/ b/ b;c/ b

Task 02:

- in / in/ in / to / to/ of / for/ of/ to/ to/ for/ to/ to.

Task 03:

Hydroelectric power is a renewable energy source which harnesses the power of moving water to produce electricity. The hydroelectric process starts long before you turn your light on at home or work. Large scale hydroelectricity projects typically involve dams. Run-of-river and tidal projects also harness the power of moving water to generate renewable electricity. A hydroelectric dam converts the potential energy stored in a water reservoir behind a dam to mechanical energy—mechanical energy is also known as kinetic energy. As the water flows down through the dam its kinetic energy is used to turn a turbine. The generator converts the turbine's mechanical energy into electricity. This electric energy then goes through various transmission processes before it reaches you.

Task 04:

- **run out/ geothermal/ Nonrenewable/ recycling/ evaporates / recreational/ Boaters/ reservoir/ hikers**

Task 05:

- **electricity/ drawbacks/ ecosystem/ dam/ aquatic/ flooding**

- **climate/ erratic/ precipitation/ rainfall/ weather/ unstable/ generate**

- **levels/ threatened/ communities/ drinking/ impacted**

- **Investment/ economical/ expenditures/ environmental/ declining**

Task 06:

- **u**se/ **p**rimarily/ **p**ower/ **w**aterwheels/ **f**actories/ **e**merge/ **b**uilt/ generate/ larger **/ c**ompleted

Task 07:

- **largest** / **capacity**/ **ways**/ **turbines**/ **tidal**/ **generate** /**energy**/ **industry**/ **fascinating/ harness**/ **innovative**

Unit IV

Task 01:

- **False/False/ False/ False/ True/ False/ False**

Task 02:

- **of** /**of** /**for** / **for** / **for** / **in** / **in** / **of** / **in** /**for** / **for** / **for** / **of** / **of** /**of** / **of** / **in** / **of** / **of**

Task 03:

- **because of / changed/ modifying / change / stagnant / increased / variety/ occurs**

Task 04:

- **materials**/ **earthfill**/ **rockfill**/ **compacted**/ **dumped**/ **excavated**/ **reservoir**/**cross-section**/ **bank**/ **core**/ **impermeable**/ **water**/ **Clayey**/ **asphaltic**/ **core**/ **permeable**/ **concrete valleys**/ **soils**/ **pressure**

Task 05:

- **Reservoir:** a large natural or artificial lake used as a source of water supply.
- **Earthfill dams**: dam built up by compacting successive layers of earth, using the most impervious materials to form a core and placing more permeable substances on the upstream and downstream sides.

- **Clyey soils**: Clay soils include loams (or silts) and clays, which are defined as fine-grained soils with a dry weight made up of more than 50% of particles sized less than 0,075 mm. They may vary in consistency from hard to very soft.

Task 06:

1. **Diverting the water**: The first step is dewatering the area of the river where the dam will be built. Engineers do this by diverting the water using tunnels. The tunnels need to be deep enough to carry water without surface runoff. You do not need to empty the river but need to make it shallow enough to work in.
2. **Preparing the dam's foundation**: If you have not sufficiently diverted water from the river, you need to make a cofferdam to help you divert water from the river to the tunnel. When building the foundation, stack the heaviest rocks first, then increasingly smaller rocks to form a firm foundation bed.
3. **Assemble the main structure**: Ensure there's no loose rock on the riverbed, and construct a plinth (concrete foundation) to prevent water from leaking from the dam edges. The next step is actual dam construction, where you build your main structure on both sides of the foundation. Most dam construction projects use reinforced concrete steel to make the dam resilient against water flow.
4. **Filling the reservoir**: After building the dam to the desired height, the next step is filling the reservoir. You then need to test whether the valves and floodgates work and monitor the behavior of the freshly built dam.

Task 07:

ARCH DAM

Curved/ pressure / straighten / abutments / constant / angle

DETENTION DAM

- **rate / recharge / sediment /livestock / recreation / released / accommodate**.

EMBANKMENT DAM

- **excavated / compacted / varying / seepage / friction / particles / stable / earthfilled rockfilled / impermeable / through / valleys**.

GRAVITY DAM

- **massive / masonry / weight/ sections / stiff / strength / ensure**

STORAGE DAM

- **capture / rainy / livestock / municipal**

Task 08:

- **consumption / amount / floodwater / recreational / reservoir / spillways / tunnels / evacuating / growth**

Task 09:

- **hold back / materials / builders / clay / concrete / Manmade / reservoirs / household / boating / activities / flooding / Mesopotamians / oldest / Jordan / farmers / irrigate**

Unit V

Task 01:

1. D

The increase in rainfall is not necessarily good news either, because the Intergovernmental Panel on Climate Change has forecast fewer rainy days, but more intense rainfall on those days. This means more flooding, and less rainwater eventually percolating underground to recharge aquifers.

2. B

"Cattle are the most vulnerable to drought, followed by sheep and goats,"...

3. A

But Pottle worries all the skills he's learned from older generations may soon become irrelevant. More and more, Inuit are relying on expensive, store-bought processed foods because it's safer and easier than catching or shooting supper.

4. C

... the Wayuu must compete for water with the continent's largest open-pit coal mine. In 2006, the construction of El Cercado dam started. The dam was designed to stop the flow of the Ranchería River and to create a reservoir that would provide nine communities with improved access to water. After the dam was completed, however, it became clear that while the reservoir would supply the mine, the Wayuu communities would be unable to access water from either the reservoir or the river, which would leave themworse off than they had originally been.

Task 02:

1. **Greenhouse effect**
2. **Greenhouse gases**
3. **Carbon dioxide**
4. **Climate change**
5. **Global warming**
6. **Rise**
7. **Atmosphere**
8. **Emissions**
9. **Ecosystem**
10. **Extinction**
11. **Electrical appliances**

Task 03:

1. **Drought**
2. **Globalwarming**
3. **Flood**
4. **Sealevel**
5. **Extinct**
6. **Greenhousegas**
7. **Pollution**
8. **Fossilfuel**
9. **Cutback**
10. **Melt**
11. **Forestfire**
12. **Climatecrisis**
13. **Desertification**
14. **Iceage**
15. **Adapt**

Task 04:

- **shifts / eruptions / driver / trapping / include / heating / release / major / causing / safety**

Task 05:

- **virtually / warming / average / warmer / previous / temperatures / beginning / system / area**

Transcripts:

Unit 1: Listening task

What does a hydraulic engineer do?

The hydraulic engineer is normally associated with storing the water resources and managing its flow by designing computerized hydraulic and hydrologic models that will meet the clients or organizations' requirements. He/she basically deals with restoring the aquatic habitat, enhancing it, analyzing the hydraulic structures and conducting the hydrologic analysis, designing structures, leading and supporting the relevant tasks, etc. To better understand the role, here is a list of key responsibilities that will explain in detail the exact nature of duties and tasks that need to be carried out by a hydraulic engineer:

15. To study and analyze the details involved in the survey reports and any other data that has the geological or topographical details and to pay attention to the details in the blue prints, maps, and other related drawings
16. To prepare rough cost estimates that would include the cost of the equipment, material as well as the labour cost that is required to complete the project within the given deadline.
17. To lead, direct, and supervise the staff members and to ensure that all the activities at the actual site are being managed and carried out effectively.
18. To be involved in designing structures and advise the subordinate members regarding any changes that need to be made and communicate it to the senior personnel.
19. To ensure that all the project specifications have been met and that all the safety and sanitation measures have been taken care of.
20. To identify the technical or any other issues, resolve them, and to prepare the reports related to various proposals, deeds, etc.

The hydraulic engineer makes sure that all the designed hydraulic systems and structures are being designed as per the government rules and regulation and that quality standards are being maintained at optimum level. He/she ensures that the work performed by the other members is complete and accurate and that it adheres by the drawing specifications and standards. He/she develops and maintains proficiency and competency in all areas of hydrologic and hydraulic designing and analysis.

Unit 2: Listening

Task 1: Industrial Uses of Water

Water is used in hotels, motels, restaurants, offices, and other commercial facilities. It is essential in the manufacturing and production of paper, chemicals, automobiles, steel, food, textile production, dying, etc. Power plants need a significant amount of water for cooling.

Water is a universal solvent and hence is used to dissolve several compounds in industrial production. It is widely used as a solvent and less commonly used as a catalyst. Water vapour is also used in several industrial processes. Water is used by smelting facilities and petroleum refineries.

Industrial uses of water are processing, diluting or fabricating a product. Rivers, canals, oceans, and seas provide simple means of transportation. There will be less friction in the water compared to land transport without any obstacles. It offers economic opportunities with an effective way to transport cargo.

Water is a source of hydroelectricity. Dams are constructed across rivers and lakes to store water which is converted to electricity using turbines. Hydroelectricity is a renewable energy source that is used across the globe. It has reduced the dependence on fossil fuels for energy.

Water is used in the extraction of minerals, oil, and gases. It is essential for several critical mining functions. Along with being a solvent, water is used in a steam turbine and heat exchanger.

Task 02: true/false

A large percentage of water is used in agriculture annually. Agriculture requires large quantities of water to grow fresh produce and sustain livestock. It is used for irrigation, pesticide and fertiliser application, frost control and crop cooling. Proper usage of water is important to manage crop yield and productivity. Farmers should follow several water conservation strategies for sustainable agriculture. Plants use water and sunlight for photosynthesis and produce oxygen. Agricultural water comes from surface water (rivers, streams, open canals, ponds, reservoirs and lakes), groundwater from wells and rainwater. Water is used in all traditional agriculture methods including the cultivation of rice, wheat, sugarcane, etc. Water quality can be affected by rampant industrialization and the illegal disposal of chemicals in water and the atmosphere. Poor water quality affects the quality of the food crop and may also cause several diseases. Water contamination is the main reason for food contamination and illnesses related to the contamination. Groundwater is a safe source of quality water. Water is used for livestock, dairies, and fish farms.

Unit3: Listening

Despite being the largest renewable source of electricity, hydropower does have its drawbacks. The most significant one is its damage to the surrounding environment and ecosystem. Most hydroelectric power plants require the construction of a dam, which would result in the destruction and fragmentation of the surrounding habitats. For example, the construction of water dams may affect the migration and movement of aquatic organisms, hinder their reproduction, and in some extreme cases, some species may

become extinct. Additionally, as most hydroelectric projects are physically large in size, it could often lead to the flooding of massive areas within a river valley.

As the effects of climate change continue to become more erratic, some regions are experiencing less precipitation while others are expecting far more rainfall and extreme weather conditions. Changing or even unstable water cycles in turn impacts power plants' ability to generate power and electricity.

For instance, the recent historic low water levels in Lake Powell, an important water body in the US and a major reservoir on the Colorado River, has threatened the water availability for the 40 million people and dozens of communities that depend on the River for drinking water. In other words, while hydropower is less affected by day-to-day weather, it is certainly impacted by climate change.

Rising investment due to limited remaining economical sites and extra expenditures in addressing social and environmental impacts is making hydropower less popular, therefore a declining overall growth across the world.

Unit 4: Listening

Task: Common types of dams

ARCH DAM

An arch dam is a concrete dam **curved** into the shape of an arch. The curved part points back to the water. When **pressure** from the water presses against the arch, the water pressure makes it **straighten** slightly, thus strengthening the structure as it pushes back its foundations and **abutments**. We classify arch dams into **constant** radius dam, variable radius dam, and constant **angle** dam.

DETENTION DAM

The primary purpose of a detention dam is to regulate the flow **rate** and minimize flood impact in a water channel. Sometimes detention dams are also constructed to **recharge** groundwater systems or trap **sediment**. Detention dams store water for extended periods for irrigation, **livestock**, hydroelectricity, municipal water supply, and **recreation**. In flood-prone areas, detention dams are built in areas higher than the flood area. The water collects in the basin above and is slowly **released** at a rate the flood zones and channels can **accommodate**.

EMBANKMENT DAM

An embankment dam is constructed from **excavated** construction materials or industrial wastes. The materials are then **compacted** to form a wall with **varying** soil compositions.

The dam is semi-impervious, and this prevents **seepage** erosion. The interaction and **friction** of materials bind the **particles** together, making a **stable** mass.

Embankment dams are classified into an **earthfilled** dam and a **rockfilled** dam. The core of embankment dams is filled with an **impermeable** material such as clay or concrete to prevent water from seeping **through**. Embankment dams are a good choice, especially for sites with broad **valleys**.

GRAVITY DAM

A gravity dam is a **massive** dam made from concrete or **masonry** designed to resist water **weight** from its self-weight. Each gravity dam section is stable and independent of other dam **sections**. These dams need **stiff** foundations with high bearing **strength** to limit the resultant force from the water. It is best to test the bearing capacity of the soil on which the foundation rests to **ensure** it can support the weight of the dam and the water.

STORAGE DAM

Storage dams are constructed to **capture** and store water, especially during **rainy** seasons, for use by **livestock** during the dry season. We also use storage dams for **municipal** water supply, hydroelectricity, and irrigation.

Unit 5: Listening

The Hottest July Since 1880

Scientists now know that the climate of our world was very different in the distant past, millions of years ago. They know, for example, that there have been at least five major ice ages and there have been times when our world was much hotter than it is now. However, it was only in the 1800s that humans first began to take detailed weather readings to study our planet's climate. Unfortunately, these weather readings have uncovered something alarming: since 1880, ten of the hottest years on record have happened since 2005. Even more worrying is the fact that July 2021 is now officially the hottest month ever recorded. In that month, hot dry weather resulted in many deaths as well as fires that destroyed many homes and forests in countries around the world, including Canada, the U.S., Greece, Turkey and Australia. The IPCC (Intergovernmental Panel on Climate Change) warns that even worse climate disasters can be expected in the future. By the end of this century, it is very possible that melting ice will cause sea levels to rise by as much as 1.1 meters – and by 2300 sea levels could be 5 meters higher. Sea level rises like this will flood practically every coastal city in the world. The IPCC says that the recent changes in climate are not natural. Unlike previous climate changes, the recent changes in weather we are now experiencing are "very likely" caused by humans. We may be able to prevent these disasters, but, if there is any chance to stop all this from happening, the time for us to act is now.

LIST OF IRREGULAR VERBS

Base Form	**Past Simple (V2)**	**Past Participle (V3)**
arise	arose	arisen
awake	awoke	awoken
be	was/were	been
bear	bore	born(e)
beat	beat	beaten
become	became	become
begin	began	begun
bend	bent	bent
bet	bet	bet
bind	bound	bound
bite	bit	bitten
bleed	bled	bled
blow	blew	blown
break	broke	broken
breed	bred	bred
bring	brought	brought
broadcast	broadcast	broadcast
build	built	built
burn	burnt/burned	burnt/burned
burst	burst	burst
buy	bought	bought
can	could	... (been able)
catch	caught	caught
choose	chose	chosen
cling	clung	clung
come	came	come
cost	cost	cost
creep	crept	crept
cut	cut	cut
deal	dealt	dealt
dig	dug	dug
do	did	done

draw	drew	drawn
dream	dreamt/dreamed	dreamt/dreamed
drink	drank	drunk
drive	drove	driven
eat	ate	eaten
fall	fell	fallen
feed	fed	fed
feel	felt	felt
fight	fought	fought
find	found	found
fly	flew	flown
forbid	forbade	forbidden
forget	forgot	forgotten
forgive	forgave	forgiven
freeze	froze	frozen
get	got	got
give	gave	given
go	went	gone
grind	ground	ground
grow	grew	grown
hang	hung	hung
have	had	had
hear	heard	heard
hide	hid	hidden
hit	hit	hit
hold	held	held
hurt	hurt	hurt
keep	kept	kept
kneel	knelt	knelt
know	knew	known
lay	laid	laid
lead	led	led
lean	leant/leaned	leant/leaned
learn	learnt/learned	learnt/learned
leave	left	left
lend	lent	lent

lie (in bed)	lay	lain
lie (to not tell the truth)	lied	lied
light	lit/lighted	lit/lighted
lose	lost	lost
make	made	made
may	might	...
mean	meant	meant
meet	met	met
mow	mowed	mown/mowed
must	had to	...
overtake	overtook	overtaken
pay	paid	paid
put	put	put
read	read	read
ride	rode	ridden
ring	rang	rung
rise	rose	risen
run	ran	run
saw	sawed	sawn/sawed
say	said	said
see	saw	seen
sell	sold	sold
send	sent	sent
set	set	set
sew	sewed	sewn/sewed
shake	shook	shaken
shall	should	...
shed	shed	shed
shine	shone	shone
shoot	shot	shot
show	showed	shown
shrink	shrank	shrunk
shut	shut	shut
sing	sang	sung
sink	sank	sunk
sit	sat	sat

sleep	slept	slept
slide	slid	slid
smell	smelt	smelt
sow	sowed	sown/sowed
speak	spoke	spoken
spell	spelt/spelled	spelt/spelled
spend	spent	spent
spill	spilt/spilled	spilt/spilled
spin	spun	spun
spit	spat	spat
spread	spread	spread
stand	stood	stood
steal	stole	stolen
stick	stuck	stuck
sting	stung	stung
stink	stank	stunk
strike	struck	struck
swear	swore	sworn
sweep	swept	swept
swell	swelled	swollen/swelled
swim	swam	swum
swing	swung	swung
take	took	taken
teach	taught	taught
tear	tore	torn
tell	told	told
think	thought	thought
throw	threw	thrown
understand	understood	understood
wake	woke	woken
wear	wore	worn
weep	wept	wept
will	would	...
win	won	won
wind	wound	wound
write	wrote	written

GLOSSARY

Absolute humidity: Mass of water contained in a unit volume of moist air.
Absorption: Incorporation of water or dissolved matter orboth into the structure of a solid.
Absorption loss: Loss of water by infiltration from a canal, reservoir or other body of water or from a field during the process of initial filling.
Abstraction: Removal of water from any source, eitherpermanently or temporarily
Abutment: That part of the valley side against which the dam is constructed, or the approach embankment in case of bridges which may intrude some distance into the waterway.
Accelerated flow: Flow in which the velocity increases in thedirection of flow.
Acceptance capacity: Quantity of pollutants which a water body can accept without the pollution exceeding a given level.
Accumulation (of snow and ice): Quantity of snow, or any other form of water in the solid state, which is added to a glacier, floating ice or a snow cover.
Acidification: Chemical changes in soil or a water body due to anthropogenic or other causes leading to acidic conditions.

Acidity: Amount of strong acids, given as milliequivalents of a strong base per litre of water, necessary to titrate the sample to a pH value of 7.

Acid rain: Rain which in the course of its history has combined with chemical elements or pollutants in the atmosphere and reaches the Earth's surface as a weak acid solution.

Actual evaporation *syn.* **effective evaporation**: Amount of water evaporated from an open watersurface or from the ground.

Adsorbed water: Water adhering in ionic or molecular layers to the surfaces of soil or mineral particles.

Adsorption: Adhesion of a thin film of liquid, vapour or dissolved ions to a solid substance without involving a chemical reaction.

Adsorption capacity: Quantity of adsorbed water which the receiving substance can accept.

Aeration: Addition of air to water resulting in an increase inits dissolved oxygen level**.**

Annual runoff *syn.* **annual flow:** Total volume of water that flows during a year, usually referring to the outflow of a drainagearea or a river basin**.**

Applied hydrology: Branch of hydrology that deals with the application of hydrological principles to the several facets of the hydrological cycle.

Aquatic ecosystem: Specific unit in a water body characterized by a specific physical and chemical medium (biotope) and the animals and plants (biocenosis) which live in this biotope.

Aquifer: Geological formation capable of storing, transmitting and yielding exploitable quantities ofwater.

Arid zone: Zone in which potential evapotranspirationalways exceeds precipitation.

Artificial recharge *syn.* **artificial replenishment:** Augmentation of the natural replenishment ofgroundwater in aquifers by artificial means.
Barrage: Structure across a stream, equipped with a series of gates or other mechanisms which control the water-surface level upstream to regulate the flow or to divert water supplies into another watercourse.

Barrier: Obstruction to the flow of surface water orgroundwater.

Basin *syn.* **drainage basin, catchment, river basin, watershed, groundwater basin:** Area having a common outlet for its surface runoff.

Bernoulli distribution *syn.* **binomial distribution:** Distribution of a discrete random variable accepting only two possible states of a system: success or failure.

Biodegradation *syn.* **biological decomposition:** Decomposition of organic matter by aerobic oranaerobic micro-organisms.

Biomass: Total mass of all living organisms present in an aquatic ecosystem or at a particular trophic level in a food chain; usually expressed as dry weight or more specifically as the carbon, nitrogen or calorific content per unit area or volume.
Brackish water freshwater: Water containing dissolved salts at a concentration greater than that of freshwater,and significantly less than that of seawater.

Brash ice: Accumulation of floating ice made up of fragments not more than 2 metres across

Capture:

1) In groundwater, decrease in discharge and increase of recharge induced by groundwaterpumping.
2) In surface water, diversion of the flow of water in the upper part of a stream by the upstream progression of another stream.

Channel:

1) Clearly defined watercourse which periodically or continuously contains moving water.
2) Watercourse forming a connecting linkbetween two water bodies.
3) Deepest portion of a watercourse, in which the main stream flows

Channel precipitation: Precipitation falling directly on the water surface within a channel.

Chemical oxygen demand (COD): Water quality indicator characterizing a potential of dissolved oxygen consumption based on the chemical oxidation of organic and mineral compounds in the water, in general by potassium dichromate.

Climate: Synthesis of weather conditions in a given area, characterized by long-term statistics of the meteorological elements in that area.
climate change: Long-term modification of the climate resulting from one or more of the following factors: (i) internal changes within the climate system; (ii) interaction between the climatic components; (iii) changes in external forces caused by natural phenomena or by human activities.

Climatic region: Region in which there is a relatively uniform climate, according to

specific criteria.
Climatic year: Continuous twelve-month period during which a complete annual climatic cycle occurs, and which is selected to provide a more meaningful comparison of meteorological data.

Climatological station for hydrological purposes: Climatological station set up in a drainage basin specifically to augment the existing climatological network in order to meet hydrological requirements.
Closed basin *syn.* **blind drainage:** Areas in which surface flow collects in sinks or lakes not connected by surface channels to other watercourses of the basin

Cloudburst: Rainstorm of extraordinary intensity and relatively short duration.

Cloud seeding: Introduction of particles of appropriate material into a cloud which modifies the cloud structure inorder to cause precipitation.

Compound hydrograph: Hydrograph resulting from a sequence of precipitation events when the flow caused byone event continues during the next event.

Condensation: Transition from the vapour state to the liquidstate.
Conduit /canal : Canal or pipeline constructed to convey large quantities of water, either by gravity or under pressure, between two locations.

Contamination: Pollution of water causing degradation of the aquatic ecosystem or affecting public health.

Critical discharge: Discharge that maintains critical flow in a channel section for a given depth of flow.

Daily storage: Volume of water which can be stored daily in a reservoir between minimum and maximum daily water levels under ordinary operating conditions.
Dam: Barrier constructed across a valley to storewater or to raise the water level.

Day of snow lying: Day during which at least half of the ground at a hydrological station is covered by snow.

Dead storage: Storage volume which cannot be released undernormal conditions.
Dead water / stagnant water: Water in a state of slow or no circulation, usually leading to an oxygen deficit.

Density: Mass of a substance per unit volume

Depth of runoff: Runoff volume from a drainage basin, divided by its area, in a specified time.

Desalination *syn.* **Desalting:** Process by which the salt content of water is reduced sufficiently to make the water fit for specified uses.

Desertification: Process by which arid or semi-arid land is transformed progressively into desert due to a continuous lack of precipitation and/or land mismanagement.

Detention storage: That part of the precipitation which is temporarily stored en route to or in the stream system, during or shortly after rainfall; detention storage includes surface and channel detention but doesnot include depression storage.
Dewatering: Removal of water from an area by artificial means to reduce the level of groundwater orsurface water.

Diffusion *syn.* **molecular diffusion:** Process of spreading of a solute as a result of continuous random molecular motion of the water and the solute.

Directional hydraulic conductivity: Combined property of an anisotropic porous medium and the flow through it which relates thespecific discharge to the hydraulic gradient.

Direct precipitation: Precipitation that falls directly on an open watersurface.
Direct runoff *syn.* **direct flow:** Water flow that enters a watercourse after precipitation without delay.

Discharge *syn.* **rate of flow:** Volume of water flowing through a river (or channel) cross-section per unit time.

Distribution hydrograph: Unit hydrograph modified to show the fraction of the volume of runoff that occurs during successive units of time.

Ditch: Man-made small open channel constructed through earth or rock for the purpose of lowering diversion of water: Transfer of water from one watercourse, either natural or man-made, to another and/or conveying water.
Downstream: Direction in which a fluid is moving.

Drinking water: Water intended for human consumption, the characteristics of which are normally regulated by legal standards.

Drought (meteorological): hydrological drought, water deficit. Prolonged absence or marked deficiency of precipitation.

Ecosystem: System formed by the interaction of a community of organisms with their environment.

Emergency spillway: Auxiliary spillway used in the event of floods exceeding the capacity of the main spillway.

Emission: Discharge of pollutants into the environmentfrom a point source.
Energy balance *syn.* **energy budget:** Equation for estimating the evaporation from open water bodies, or the evapotranspiration from land surfaces, in which the increase in energy stored in the water body or land surface is the residual between the incoming and the outgoing energies.

Engineering hydrology: Branch of applied hydrology which deals with hydrological information intended for engineering applications.
Environmental isotopes: Natural isotopes, particularly those of oxygen and hydrogen, used to trace, date.

Evaporation (of water): Process by which water changes from liquid to vapour at a temperature below boiling point and identify water bodies.

Erosion: Wearing away and transport of soil and rock by running water, glaciers, wind or waves.

Evaporation (of water): Process by which water changes from liquid to vapour at a temperature below boiling point.

Evapotranspiration (of water): Combined processes by which water is transferred to the atmosphere from the soil by evaporation and from the vegetation bytranspiration.

Filtration: Process of passing a liquid through a filtering medium to remove suspended or colloidal matter.
Flood:

(1) Rise, usually brief, in the water level of a stream or water body to a peak from which the water level recedes at a slower rate.

(2) Relatively high flow as measured by stage height or discharge.

Freezing point: Temperature of solidification of a liquid undergiven conditions.
Freshwater: Water with a low concentration of salts, or generally accepted as suitable for the productionof potable water.

Frost: Covering by ice produced by the sublimation of water vapour on objects that are colder than 0 degrees Celsius.

Glacial hydrology: Branch of hydrology which deals with the origin, processes and regime of liquid water in a glacial system.

Groundwater: Subsurface water occupying the saturated zone.

Groundwater balance: Evaluation, over a period of time, of the recharge of a groundwater system (infiltration and inflow from an adjacent aquifer), the corresponding discharge (groundwater outflowand groundwater abstraction) and the change in storage.
Hard water: Water in which relatively large amounts of minerals, mainly calcium and magnesium salts, are dissolved.

Humid zone: Zone in which precipitation exceeds potentialevapotranspiration.
Hydraulic conductivity: Property of a porous medium which, according to Darcy's law, relates the specific discharge to the hydraulic gradient.

Hydraulics: Branch of fluid mechanics dealing with the flow of water (or other liquids) in conduits and open watercourses.

Hydraulic structures: Water management facilities constructed for the utilization of water resources or as protectivemeasures against water damage.

Hydrology: Science that deals with the waters above and below the land surfaces of the Earth; their occurrence, circulation and distribution, both in time and space; their biological, chemical and physical properties; and their interaction with their environment, including their relation to living beings.

Ice: Solid form of water.
Infiltration: Flow of water through the soil surface into aporous medium.

Irrigation: Artificial application of water to lands for thegrowing of crops.

Lake: Inland body of surface water of significantextent.

Leakage (in groundwater): Flow of water from or into an aquifer through an underlying or overlying semi-pervious layer.
Liquid: Substance that is neither a solid nor a gas, that is practically incompressible, offers insignificant resistance to change of shape and flows freely.

Litter: Uppermost layer of organic debris, composed of freshly fallen or slightly decomposed organic material.

Longitudinal section (in surface hydrology): Vertical section along a watercourse at its centreline.

Maximum allowable concentration *syn.* **admissible concentration limit***:* Upper limit of the concentration of a substancein water which is not harmful for a certain purpose.
Maximum annual flood: Highest annual flood discharge reached during the period of record.

Mineralization:

(1) Transfer of mineral salts into water as a result of contact with geological formations or soils.

(2) Conversion of organic tissues into an inorganic state as a result of decomposition bysoil or water micro-organisms.

Mineral water:

(1) Natural water with a concentration of dissolved salts greater than a defined threshold.

(2) Natural groundwater which has special organoleptic and/or therapeutic properties due to its dissolved mineral content and physical characteristics; in most countries, the "Mineral Water" label is regulated according to specific standards and procedures.

Nitrification: Oxidation of nitrogenous matter into nitrites or nitrates by micro-organisms.

Non-point-source pollution: Pollution of water bodies from dispersed sources such as fertilizers, chemicals and pesticides used in agriculture practices.

Non-structural flood mitigation: Systems for reducing the effects of floods using non-structural means, such as land-use planning, advanced warning systems and flood insurance.

Non-uniform flow: Flow in which the velocity vector is not constant along each streamline.

Nutrient: Nutritional element for which assimilation is possible without digestive transformation, the most important being nitrogen and phosphorous.

Outflow *op.* **inflow:** Flow of water out of a hydrosystem.

Overflow: Excess water which spills over the ordinary limits of a surface water or groundwater reservoir.

Percolation: Flow of a liquid through an unsaturated porous medium, such as that of water in soil under the effect of gravity.

pH: Absolute value of the decimal logarithm of the hydrogen-ion concentration in a medium, used as an indicator of acidity (pH < 7) or alkalinity(pH > 7).

Phreatic aquifer *syn.* **free groundwater, unconfined groundwater, water table aquifer**: Saturated water-bearing formation which has awater table.

Piping *syn.* **Boil:** Upward flow of water in a sandy formation caused by an imbalance of hydrostatic pressure resulting from rising waters in a nearby stream or from removing the overburden during excavations.

Plane flow: Flow with streamlines which are contained inparallel planes.

Point source pollution: Pollution with a precisely located origin.

Pollutant: Substance which disrupts and interferes with the equilibrium of a water system and impairs the suitability of using the water for a desired purpose.

Pollution (of water): Introduction into water of any undesirable substance which renders the water unfit for its intended use.

Potable water: Natural or treated water which is of acceptable quality to satisfy the standards required for drinking water.

Precipitation:

(1) Liquid or solid products of the condensation or sublimation of water vapour falling from clouds or deposited from air on to the ground.

(2) Amount of precipitation on a unit of horizontalsurface per unit time.

Precipitation station: Station at which observations of precipitationonly are made.

Purification: Treatment of water (or sewage) to change harmful or undesirable physical properties and to remove harmful and undesirable chemical substances and living organisms.

Rain: Precipitation of liquid water.

Rainfall distribution: Manner in which the amount of rainfall varies over space and time Rainfall (depth): Amount of rain (expressed as depth of water on a horizontal surface).

Rainfall intensity: Rate at which rainfall occurs, expressed in units of depth per unit of time.

Recharge area *syn.* **intake area, replenishment area:** Area which contributes water to an aquifer, either by direct infiltration or by runoff and subsequent infiltration.

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APPENDICES

Worksheet 1: Planning Strategies/Previewing

1. *Setting reading goals and objectives*
2. *Previewing a document*

Reading goals:
……....

……
…….

Reading objectives:
……

……
……
……
……

Previewing a document:

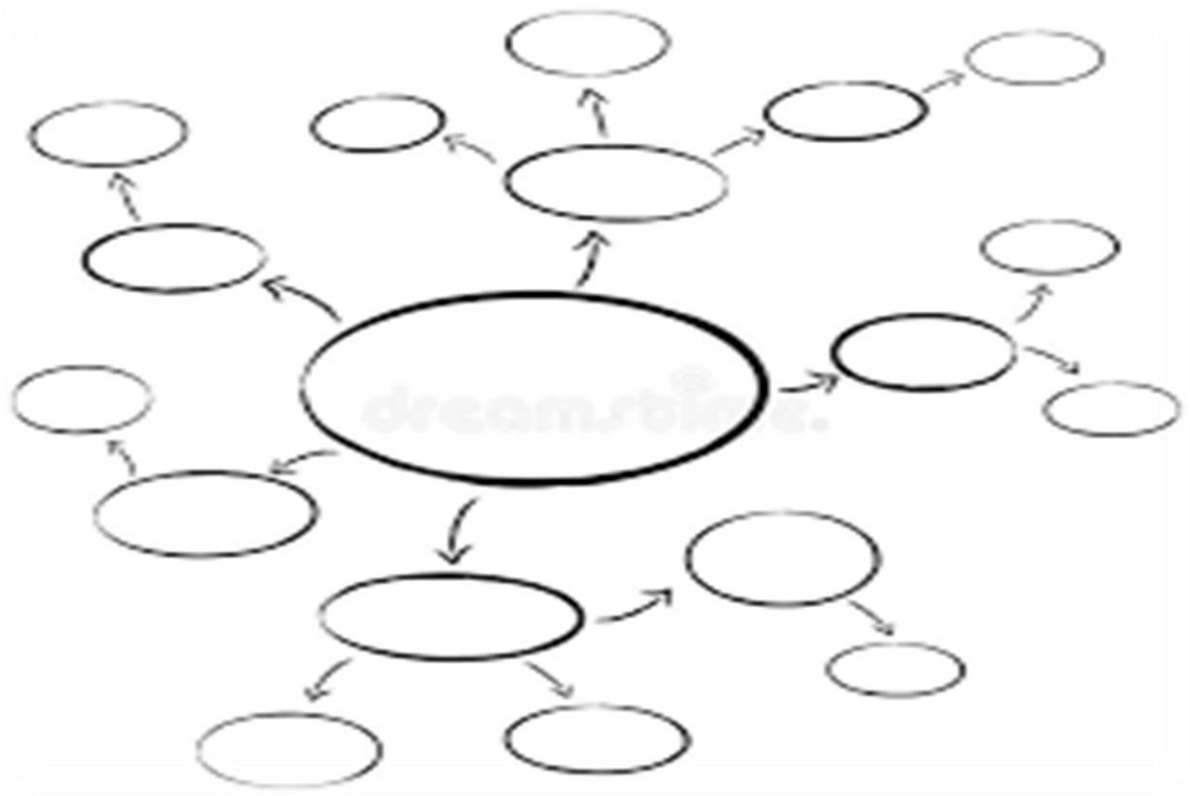
Use the questions and/or instructions in the left column to guide your pre-reading. Record your responses in the right column.

Previewing the doc	**Responses**
What is the title of the document? Who is the author? What is the source? Is it relevant to your research?	
Describe any visuals in the section you have selected to read.	

Provide some comments about the document (e.g., length, number of paragraphs or pages, layout, visuals, etc.).	

Worksheet 2: Mind Maps (Brainstorming)/Prediction

Try to brainstorm and share anything you know about the topic in the centre of the mind map below. You can add more ideas and/or questions as branches off the centre of the map



Make predictions about the text by answering the questions below:

Predicting the main idea	
Read the title of the text and make predictions about the main idea. What will this text be about?	

Now, read the first and last paragraphs. What do we know about the text that we didn't know before?	
Compare your predictions to the information found in the text (true/false).	
Predicting the Genre	
What do you know about this genre?	
How will the text be organized and developed?	

Worksheet 3: 30-second expert

To complete this task, take a few minutes to fill in the left column, "what do I know about this topic?" once you have written all that you know about the topic, follow the steps below.

Step 1: Stand and find a partner. Stay standing.

Step 2: One person shares his or her thoughts while the other listens. You have 30 seconds to share. Begin by saying, "I am an expert on this topic because I know …"

Step 3: The listener will summarize what she or he has heard. Begin your summary with "According to" (insert name) and summarize what you heard. After your summary, ask, "Did I get that right?"

Step 4: Reverse roles. Speaker becomes listener and listener now speaks.

Step 5: Be sure to thank your partner when you finish.

Step 6: Record any new knowledge in the right column.

Topic:……
……

Partner's name:…….

What do I know about this topic?(before reading the text)	**What new knowledge or understanding have I gained from listening to my partner? (before reading the text)**

Worksheet 4: Building vocabulary

Scan the title, subtitles, captions, reading aids, and first and last paragraphs. Identify ten words that seem important (for instance words that are important to the topic, content vocabulary, or key concepts). Once you have identified these words, write them in the "Word" column. Use a dictionary to look up the words you have never met before.

Word	**Definition in your own words**
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

3. Select 5 words and use them in meaningful sentences

……

……

……

……

……

……

…….