

PONY

سلسلة كتب الأستاز

SCIENCE

6th
Primary

Second Term

March Revision

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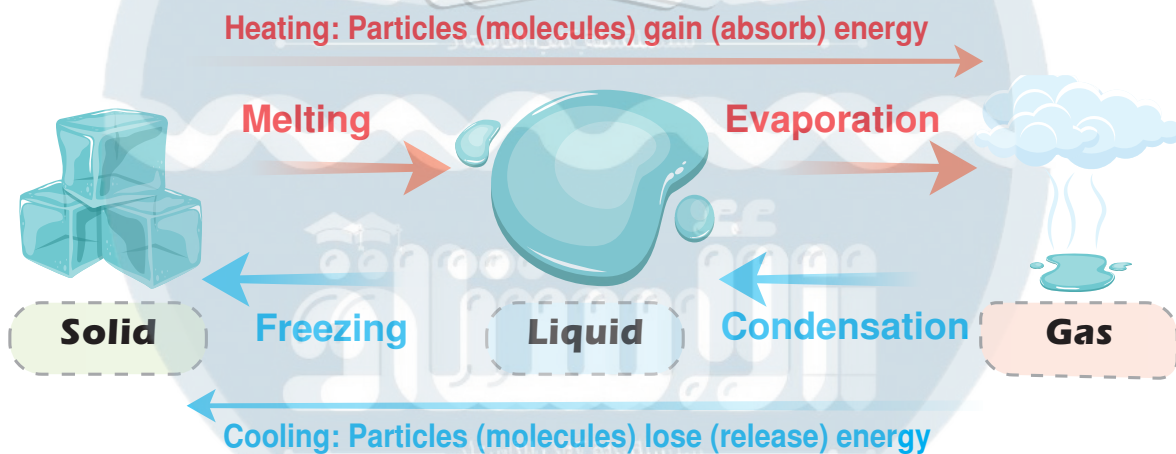
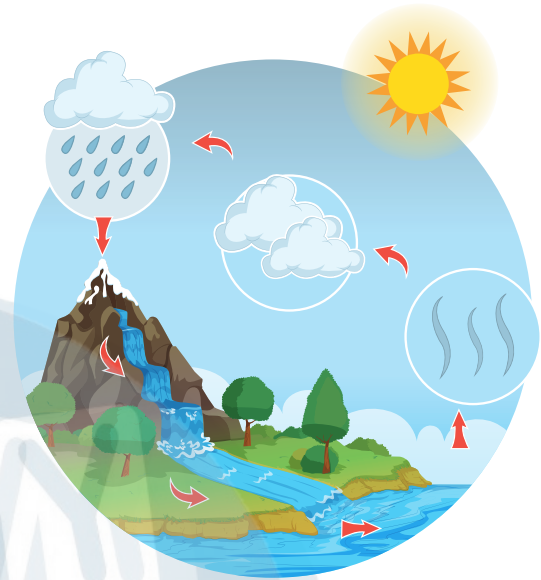
Concept 3.1

Summary:

» Water on Earth exists in **three states**:

- 1 Solid (ice)
- 2 Liquid (water)
- 3 Gaseous (water vapor)

» Water changes from one state to another when it **gains** or **loses** energy.

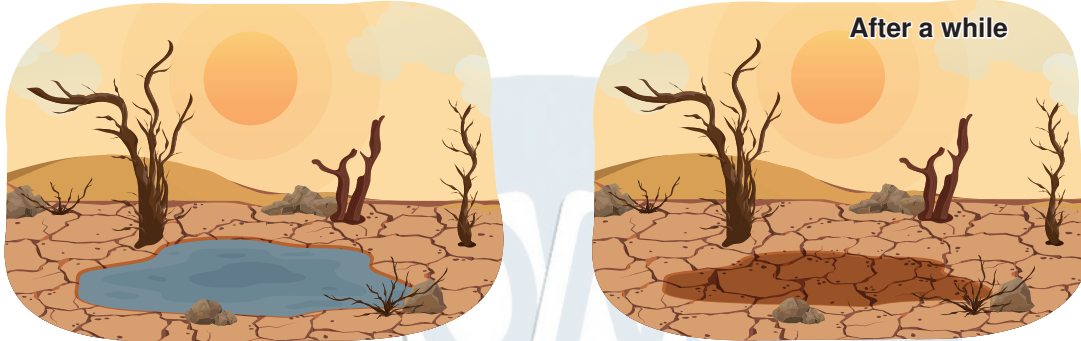


• **Melting** and **evaporation** are processes that occur when particles in matter **gain (absorb)** thermal energy.

• **Condensation** and **freezing** are processes that occur when particles in matter **lose (release)** thermal energy.

Water Levels in Lakes:

- » Water levels in lakes **rise (increase)** due to the **precipitation** process.
- » Water levels in lakes **drop (decrease)** due to the **evaporation** process.



- » The water levels in lakes rise and drop due to the **energy transfer** during the water cycle.
- » Scientists try to find ways to conserve ecosystems from **climate change**.

Examples:

- » There was a **large salt lake** in Turkey that had hosted huge colonies of flamingos.
- » Over time, it turned into a **puddle**, then it **dried up** completely in the summer.

They **migrate** and **breed (reproduce)** there when the weather is **warm**.

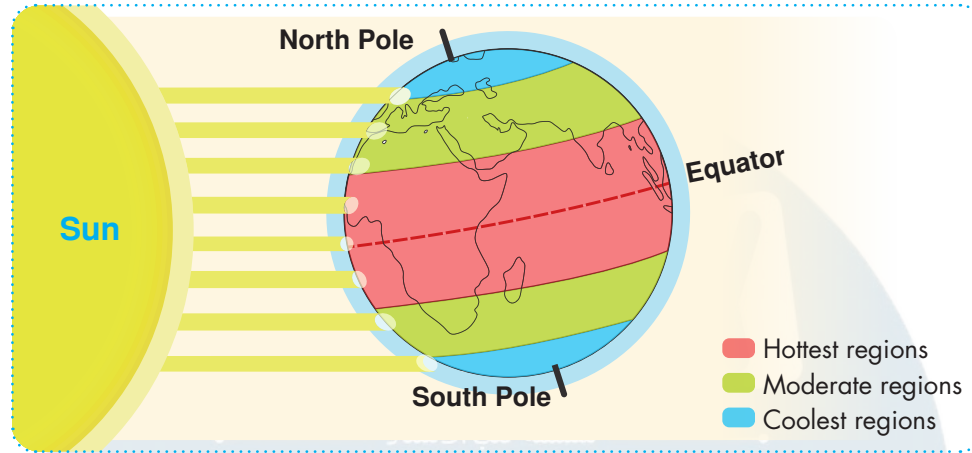


Flamingos

They feed on the **algae** in the lake's **shallow** water.

Solar Energy Distribution

- » The amount of solar radiation that reaches different areas on the Earth's surface is **unequal**.
- » The following figure shows the distribution of solar energy on the Earth.

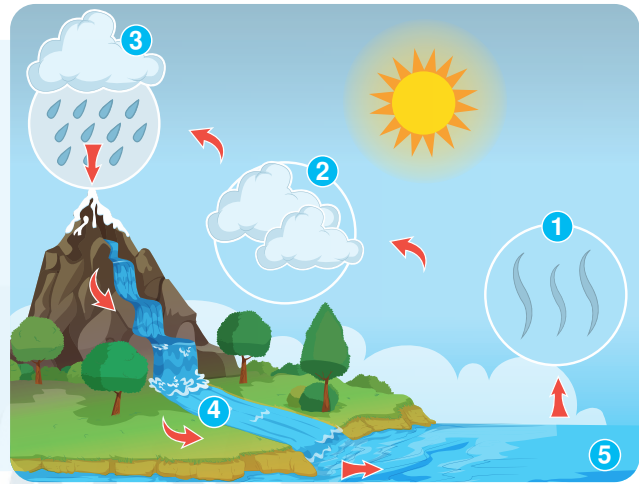


We can divide the Earth into three different climatic zones:

| Region | Hottest Regions | Moderate Regions | Coolest Regions |
|-------------------------|--------------------------------|--------------------------------------------------------|-------------------------------------------------------------|
| Location | They are close to the equator. | They are located on the north or south of the equator. | They are regions near the North or South pole of the Earth. |
| Weather | Hot and wet (humid) | Warm | Very cold |
| The Rate of Evaporation | Highest | Moderate | Lowest |
| Sunrays | Perpendicular on a small area | Semi-slanted (semi-inclined) on a larger area | Very slanted (very inclined) on a much greater area |

Water Cycle

- There is **no** start point or end point for the water cycle.
- Even in a **dry desert**, the water cycle takes place.
- The two basic factors that drive the water cycle are **solar energy** and **gravity force**.



First: Important definitions:

| | |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water cycle | It is the movement of water among the various reservoirs. |
| Water reservoir | It's the storage location of water on Earth, such as: <ul style="list-style-type: none"> • Oceans • Seas • Rivers • Lakes • Glaciers • Groundwater • Soil • Rocks • Living organism |

The water cycle consists of **three main processes** and **two steps**:

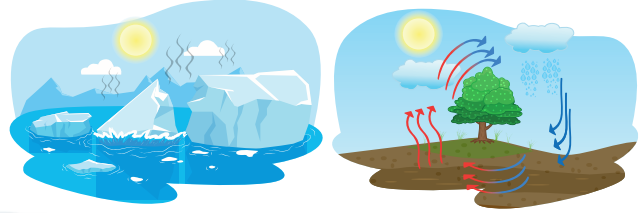
| | |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------|
| 1 Evaporation: | It is a process in which water changes from a liquid state into a gaseous state. |
| 2 Condensation: | It is a process in which water changes from a gaseous state into a liquid state. |
| 3 Precipitation: | It is a process in which water falls on the Earth's surface in the form of rain, sleet, hail, or snow. |
| 4 Runoff: | It is a step in which water flows along the Earth's surface into streams or rivers, then into the sea or the ocean. |
| 5 Collection: | It is a step in which the water of rain is collected in different bodies of water. |

Second: Factors that affect the water cycle:

Sun:

Sun provides the energy needed to:

- Melt ice into water.
- Evaporate water into water vapor.
- Generate wind.



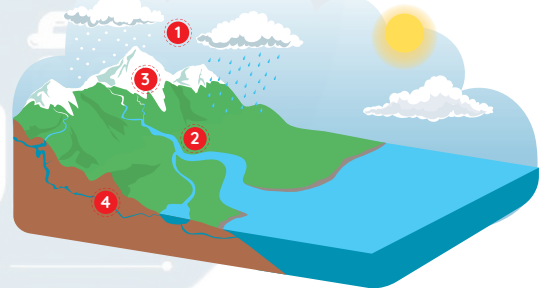
Wind:

- Wind moves water vapor and clouds from one place to another.
- Wind causes **ocean currents** that transport water to different locations on Earth.



Gravity:

- 1 Gravity pulls **water droplets** and **ice crystals** in clouds down to fall back to Earth's surface.



- 2 Gravity pulls **liquid water** to flow downhill in **streams** and **rivers** toward larger water bodies.

- 3 Gravity pulls **glaciers** from higher elevation to lower elevation.

- 4 Gravity also causes **liquid water** to leak down into the ground to the **groundwater reservoir**.

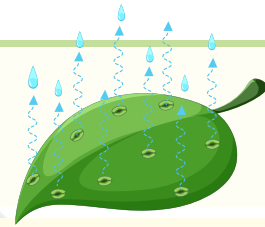
Third: Steps of the water cycle:

1 Evaporation

- The sun heats liquid water of oceans, seas, and lakes to change it to water vapor.
- Plants give off water vapor through **transpiration**.

Transpiration

The process of releasing **water vapor** into the air through tiny pores on the **leaves** called **stomata**.



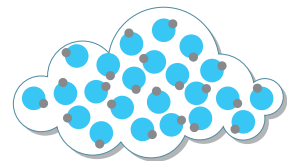
- Transpiration is a form of evaporation.
- About **10%** of the water vapor in the air comes from **transpiration**.
- You can observe transpiration when a plant is set in the sun with a plastic bag tied around the leaves.
- The rate of transpiration increases by increasing solar radiation.

2 Condensation

- Water vapor in moist air is **cooled** and **condensed**, forming water droplets.
- Water droplets stick on the particles of **dust**, **pollen**, and **smoke** in the air.
- **Millions** of tiny water droplets are collected together, forming a **cloud**.

Examples of Condensation:

- The formation of fogs and clouds
- The formation of water droplets on the glass cup contains cold water.



3 Precipitation

- When water droplets in clouds become too heavy, gravity will pull water droplets down in the form of precipitation.



4 Runoff

- When precipitation hits Earth in the form of **rain**, **snow**, **sleet**, or **hail**, it may flow across the land as runoff.

5 Collection

- Runoff is collected in **streams**, **rivers**, **lakes**, or **oceans**.
- Eventually, water evaporates and starts the water cycle all over again.

Convection Current

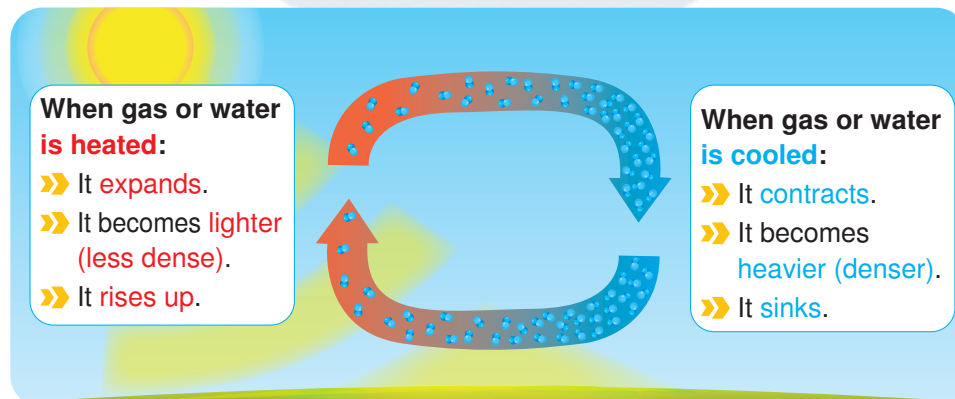
First: Ways of heat transfer:

- Heat transfers through solids by **conduction**.
- Heat transfers through fluids (liquids and gases) by **convection**.
- Heat transfers from the sun through the space by **radiation**.

Second: Experiment:

What happens if:

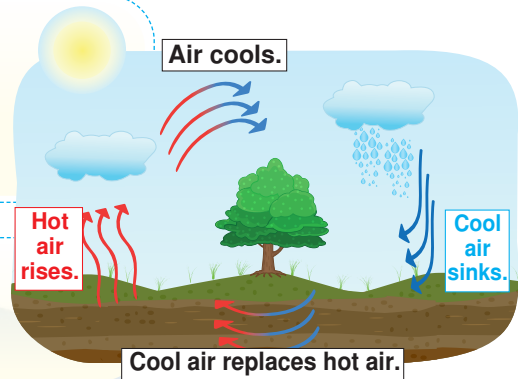
- 1 You place the **blue cold water** on **yellow hot water**?
 - The two colors will mix together, forming green color.
- 2 You place the **yellow hot water** on **blue cold water**?
 - The two colors will not mix together.



Third: Convection current in nature:

As warm, moist air rises, water vapor in the air cools and condenses into water droplets to form clouds.

As warm air is replaced by cold air, this process generates wind.



The **rising warm air** loses water in the form of rain. The **descending cold air** becomes dry when it reaches Earth's surface.

When the **dry air** flows on Earth, it forms a group of **deserts**.

Convection currents happen in

Atmosphere

Water

Earth's Mantle

Circulation of convection currents helps to

determine regional climates.

generate wind.

produce ocean current.

- Earth has a **global wind system** that consists of winds that blow in a constant direction over long periods of time.
- **The wind direction is determined by two factors:**
 - 1 The unequal solar radiation at different latitudes.
 - 2 The rotation of Earth.

Meteorologists

They are scientists who use different tools to **study** and **forecast** the weather.



Meteorology

It is the science of studying and predicting the weather.

Meteorologists predict weather through three stages:

Gathering Data

Analyzing Data

Putting It All Together






1 Collecting (Gathering) Data:

Give a reason for:

- Meteorologists collect as much data as they can about weather.

To ensure that they have a complete understanding of the weather.

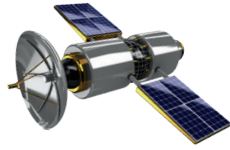
(A) Measurement Tools:

| | | |
|----------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Thermometer | Measures the air temperature . |  |
| Barometer | Measures the air pressure . |  |
| Anemometer | Measures the wind speed . |  |
| Rain gauge | It can record how much precipitation is falling in an area. |  |
| Weather radar | It detects precipitation and tracks thunderstorms and hurricanes . |  |

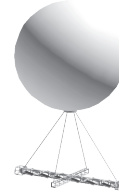
(B) Carrying Measurement tools:



Airplanes



Satellites

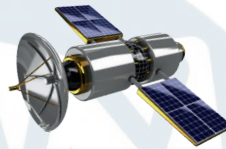


Weather Balloons

(C) Transmitting Data Tools:



Weather Station

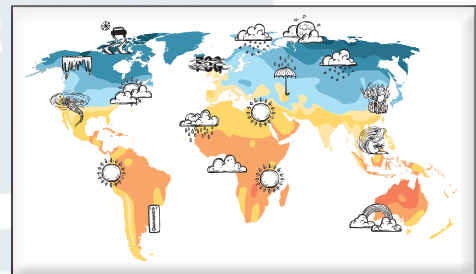


Satellite

2 Analyzing Data:

- One of the most useful ways to analyze data is **mapping data**.
- **Mapping data helps meteorologists to:**

- 1 Identify weather patterns and air movement.
- 2 Communicate information to meteorologists and the public.



3 Putting It all Together:

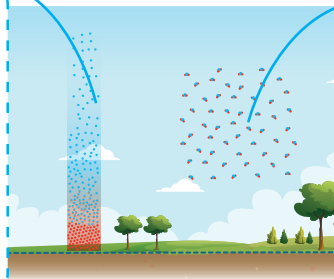
- Meteorologists apply what they know about how other factors, such as **landforms**, affect weather.
 - Meteorologists use **complex computer models** to predict how different factors will interact.
- Weather forecasts can be **uncertain** for the next days or weeks.
 - Some unexpected changes in weather patterns may happen.

Atmospheric Pressure

It is the **weight** of the air column above a location.

Or

It is the **force** that air exerts on its surroundings.



Humidity

It is the measure of how much **water vapor** is present in the air.

Changes in the Atmosphere

» The properties of the atmosphere are different at the top and the bottom of a mountain.

As the elevation from the sea level **increases**, all the following **decrease**:

1 Temperature

2 Atmospheric Pressure

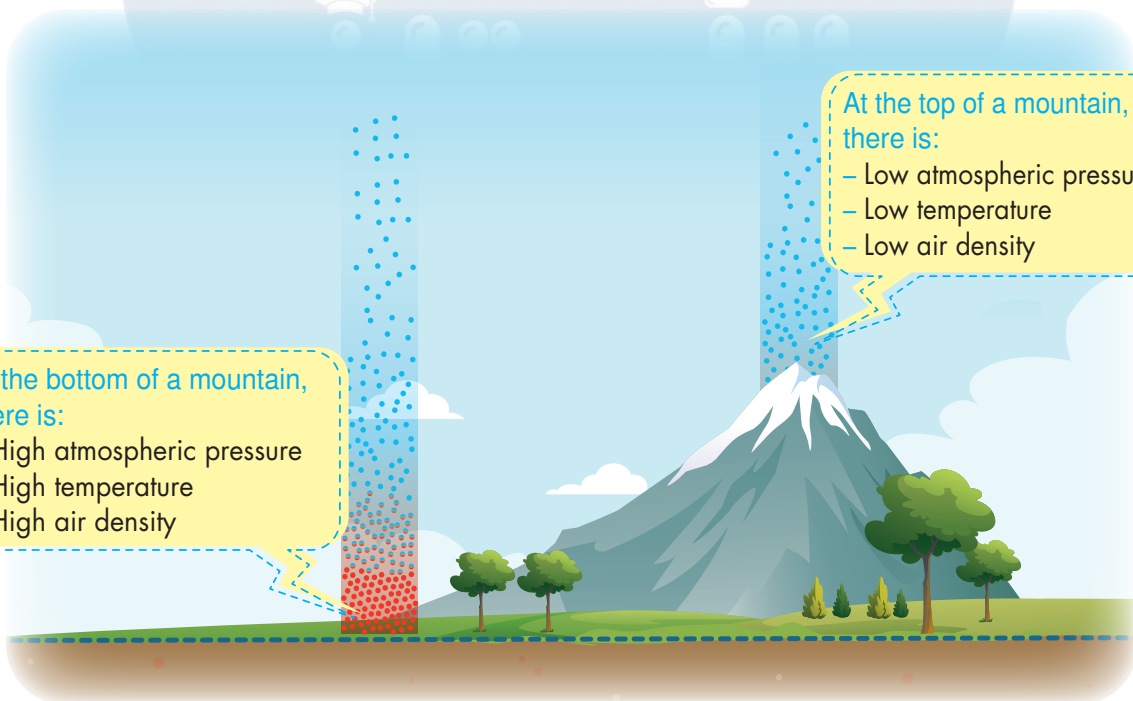
3 Air Density

At the bottom of a mountain, there is:

- High atmospheric pressure
- High temperature
- High air density

At the top of a mountain, there is:

- Low atmospheric pressure
- Low temperature
- Low air density



Desert:

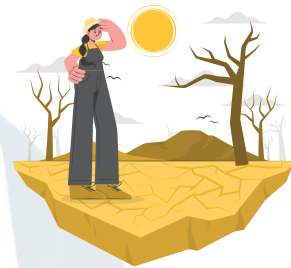
| | |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climate: | Hot and dry |
| Rainfall: | <ul style="list-style-type: none"> It has the least amount of rain compared to other biomes. Deserts receive about 250 millimeters of rain per year. |



» Farming is difficult in the desert biome.

Because more water evaporates than water that falls by precipitation.

» Farmers use **innovative ways** to make the soil **fertile** and **fruitful**, such as:



Water

They irrigate crops by reusing water.

Soil

They improve soil quality.

Crops

They grow crops that are able to withstand the heat and low-fertility soil.

Energy

They use solar energy or wind turbines to power the farm.

Rain shadow:

Definition:

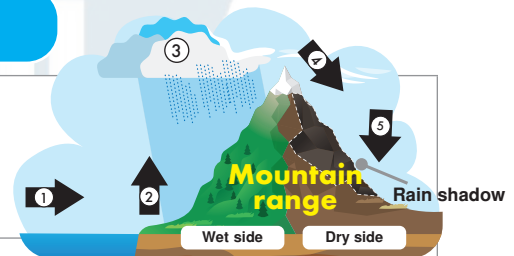
An area on the dry side of a mountain range where rainfall is reduced.

How does it form?

It is formed when mountains block the humid air.

Steps of formation:

- 1 Humid air encounters a mountain range.
- 2 The air rises up.
- 3 The air cools, water vapor condenses and Precipitation occurs.
- 4 The air descends and becomes warm and dry.
- 5 The air dries the land on the other side of the mountain.



Experiment ①: The unequal heating of Earth

- » The solar radiation has a different effect on water and land on the Earth's surface.
- » Sand heats up and cools faster than water.

| | Day Temperature | Night Temperature |
|-----------------|----------------------------------------------------------|-------------------------------------------------------|
| Coastal Regions | Moderate temperature (Because water heats up slowly.) | Moderate temperature (Because water cools slowly.) |
| Desert Regions | High temperature (Because sand heats up quickly.) | Low temperature (Because sand cools quickly.) |

Experiment ②: Spinning paper spiral

What happens if:

① You hold the paper spiral over the lighted lamp?

- The paper spiral begins to spin without stopping.

Reason:

- The warm air around the paper spiral expands and becomes less dense. So, it moves up, allowing the cooler and denser particles to move downward.

② You sprinkle talcum powder over the hot, lighted lamp?

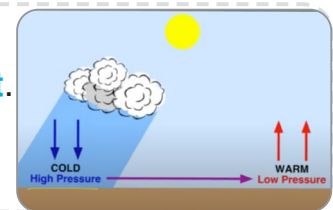
- The powder rises above the lighted lamp.

③ You sprinkle talcum powder over the turned of the lamp?

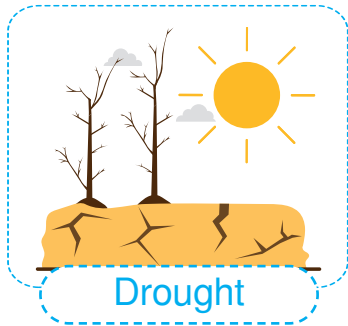
- The powder spreads and interferes with cooler air.



- The **vertical** movement of air is called the **air current**.
- The **horizontal** movement of air is called **wind**.



Extreme Weather Events:



» In recent years, there has been an increase in the **extreme weather events** due to **global climate change**.

Extreme precipitation events cause:

Changing ecosystems.

Damage to human structures and agricultural systems.

Injuries and deaths.

1 Drought:

2 Flooding:

Definition

It is the lack (shortage) of available water in an area.

It is the overflow of water on the land around riverbanks edges.

Reasons:

- A long period of dry weather due to extreme hot temperature.
- Rapid increase in rainfall.
- The sudden melting of snow and ice over a region.

Harms

- There is not enough water for growing crops, farming animals, industry, and cities.
- It damages buildings by moving or breaking them.
- It leads to the drowning of people and animals.
- It can harm economies.

Advantages of Floods:

» Some ecosystems depend on periodic flooding, ecosystems along the Nile.



- In general, ecosystems eventually recover from flooding.
- Every few decades, very extreme floods will occur.
- Flooding is worse if the ground is frozen. Because it cannot absorb water.

3 Sandstorms: (Dust storm)

| | |
|----------------------------------|-------------------------------------------------------------------------------|
| Reason (way of formation) | Sandstorms happen when very strong wind blow up sand or dust from a dry area. |
| Their locations | They are common in deserts. |
| Their shapes | A solid wall of debris and dust traveling along a horizon. |
| Their sizes | They extended several kilometers long and hundreds of meters high. |

Harms of Sandstorms:

| | |
|---------------------|------------------------------------------------------------------------------------------------------|
| On humans | ① They are dangerous to motorists and drivers because they reduce visibility and increase accidents. |
| | ② The dust harms your health if dust is inhaled or blown into your eyes. |
| On water | ③ Dust fills irrigation canals, decreasing water quality. |
| On Energy | ④ Dust builds up on solar panels and stops the generation of energy. |
| On airplanes | ⑤ It damages plane engines. |

1 (A) Complete the following statement:

- The convection currents move in direction.

(B) Cross out the odd word:

- Melting – Evaporation – Freezing – Transpiration (.....)

(C) Give a reason for:

1. Snow forms on the top of the mountain while the water remain liquid at the bottom.
.....
2. Living organisms are considered a part of the water cycle on the Earth's surface.
.....

2 (A) Write what the following statement indicate:

- The science of studying and predicting weather. (.....)

(B) What happens if:

1. Very dry wind blows over an area of the land?
.....
2. Dust accumulates over solar panels?
.....

3 (A) Correct the following statement:

- Solar energy is distributed equally across the Earth's surface which leads to climate diversity.
.....

(B) Mention:

1. The importance of weather radar.
.....
2. The negative effects of flooding.
.....

1 (A) Complete the following statement:

- Leakage of water into groundwater reservoirs is due to the action of
 (a) condensation (b) gravity (c) precipitation (d) evaporation

(B) Cross out the odd word:

- Rain – Sleet – Hail – water vapour (.....)

(C) What happens if:

- A lake is subjected to a very hot temperature?

- The amount of water vapor in the air increases?

2 (A) Write what the following statement indicate:

- A process by which plants get rid of excess water in the form of water vapor through stomata. (.....)

(B) Give a reason for:

- The regions near the equator are very hot.

- Weather forecasting is difficult and meteorologists may not be able to make accurate predictions.

3 (A) Complete the following statements:

- Using is one of the most effective methods for analyzing collected data.
- The two basic factors for water cycle are and

(B) What is the relation between convection and condensation?

.....

1 (A) Cross out the odd word:

- Barometer – Anemometer – Thermometer – Humidity (.....)

(B) Read the following statement and then correct it:

- Streams flows due to gravity from low lying areas to high lying areas.
-

(C) Give a reason for:

1. The dangers of flooding increase if the land is frozen.
-

2. Water percolates down into the ground.
-

2 (A) Write what the following statement indicate:

- The weight of the air above an area on Earth. (.....)

(B) What happens:

1. If water droplets in cloud become too heavy?
-

2. To sand and water at the day after they exposed to sunlight?
-

3 (A) Choose the correct answer:

- A rain shadow is an area that is formed behind a
- (a) tree (b) mountain (c) bridge (d) building

(B) Mention the importance of:

- Weather balloon.
-

(C) A farmer watches the rain falling in large amounts during this season and wanted to know the amount of rain. What is the tool is used for this?

.....

1 (A) Choose the correct answer:

- damages buildings by moving or breaking them.
- Ⓐ Gentle wind Ⓑ Flooding Ⓒ Drought Ⓓ Sunlight

(B) Explain the role of gravity in the water cycle in nature" Mention two points".

.....

(C) Give a reason for:

1. The spinning of the paper spiral over a turned on lamp.

.....

2. The regions near the two poles are very cold.

.....

2 (A) Complete the following statement:

- The water level in lakes increases due to process.

(B) What happens if:

1. The ice melts suddenly?

.....

2. Water of ocean gains thermal energy from the sun.

.....

3 (A) Read the following statement and then correct it:

- Condensation occurs when a gas is heated and turns into a liquid.

.....

(B) Write what the following statement indicate:

- The amount of water vapor present in the air. (.....)

(C) Compare between:

- Weather – climate (In terms of the time period)

.....

1 (A) Complete the following statement:

- Air pressure at the top of the mountain is than air pressure at the bottom of the mountain.

(B) What happens if:

1. Sunlight falls perpendicularly on the Earth's surface?

.....

2. Water vapour rises up in the air?

.....

(C) What is meant by:

- Water reservoir.

.....

2 (A) Write what the following statement indicate:

- A scientist that uses a variety of tools and instruments to study and forecast weather. (.....)

(B) Give a reason for:

1. Plants grow slowly in the windless area of the mountain.

.....

2. When hot air loses its heat, it descends downward.

.....

3 (A) Read the following statements and then corrects the incorrect one:

- Runoff is the flow of water beneath the Earth's surface after precipitation.

.....

(B) Explain methods that farmers created to overcome desert soil.

.....

(C) Compare between each of the following:

- Anemometer – Rain gauge (In terms of the function)

.....

Models answers

March Tests Model Exam (1)

- Q 1** A) • vertical
B) • Freezing
C) 1- Because air temperature decreases gradually as altitude from sea level increases.
2- Because 10% of water vapor in air comes from plants through transpiration process.
- Q 2** A) • Meteorology
B) 1- It forms a group of deserts.
2- It will stop generating electricity.
- Q 3** A) • Solar energy is distributed unequally across Earth's surface which leads to climate diversity.
B) 1- It detects intensity of precipitation, and track thunderstorms and hurricanes.
2- Drowning of living organisms – Damaging of building

March Tests Model Exam (2)

- Q 1** A) • ⓑ
B) • Water vapour
C) 1- The water of lake will evaporates and the lake may dry up.
2- Humidity will increase.
- Q 2** A) • Transpiration
B) 1- Because sunrays fall perpendicular on small area.
2- Because small and unexpected changes in wind, air temperature or humidity may occur.
- Q 3** A) 1- weather maps
2- solar energy (sun) – gravity
B) • As warm moist air rises up by convection, it cools and condenses into water droplets that join together forming clouds.

March Tests Model Exam (3)

- Q 1** A) • Humidity
B) • Ground water flows due to gravity from high lying areas to low lying areas.
C) 1- Because the frozen ground doesn't absorb water.
2- Due to the action of Earth's gravity.
- Q 2** A) • Atmospheric pressure
B) 1- Water droplets will fall in the form of precipitation.
2- The sand heats up faster than water.
- Q 3** A) • ⓑ
B) • It is used to carry measuring tools to measure weather conditions at higher altitudes.
C) • Rain guage

March Tests Model Exam (4)

- Q 1** A) • ⓑ
B) 1- Gravity pulls water droplets and ice crystals toward Earth's surface.
2- Gravity pulls water to leak through rocks forming groundwater.
C) 1- Due to convection current.
2- Because the sunrays fall very inclined on very large area.
- Q 2** A) • precipitation
B) 1- It causes flooding.
2- Water evaporates into water vapour and rises up.
- Q 3** A) • Condensation occurs when a gas is cooled and turns into a liquid.
B) • Humidity

C)

| P.O.C | Weather | Climate |
|-----------------|------------|-------------|
| The time period | Short | Long |
| Type of Water | Salt water | Fresh water |

March Tests **Model Exam (5)**

Q 1 A) 1- less

B) 1- It causes high effect of heat, so the weather becomes hot.

2- Water vapour cools and condenses forming water droplets.

C) • It is the storage location of water on Earth.

Q 2 A) • Meteorologist

B) 1- Due to the effect of dry air that descends on this side.

2- Because the air density increases and becomes denser.

Q 3 A) • Runoff is the flow of water on the Earth's surface after precipitation.

B) • They improve soil quality. – They irrigate crops by reusing water.

C)

| Anemometer | Rain gauge |
|---------------------------------------|---------------------------------------------------------------|
| It is used to measure the wind speed. | It is used to measure the amount of precipitation in an area. |

تطبيق



مذكرات جاهزة للطباعة

لتحميل الملفات التعليمية مجاناً للمعلم والطالب

مذكرات وملازم / مراجعات وملخصات / امتحانات / كتب الوزارة /
أدلة المعلم / دفاتر التحضير / سجلات مدرسية / أوراق تأسيس

امسح الكود بموبايلك علشان تقدر تثبت التطبيق

وتقدر ف أي وقت تحمّل ال نفسك فيه ببلاش

هيغنيك عن البحث والجروبات والقنوات الكثيرة

