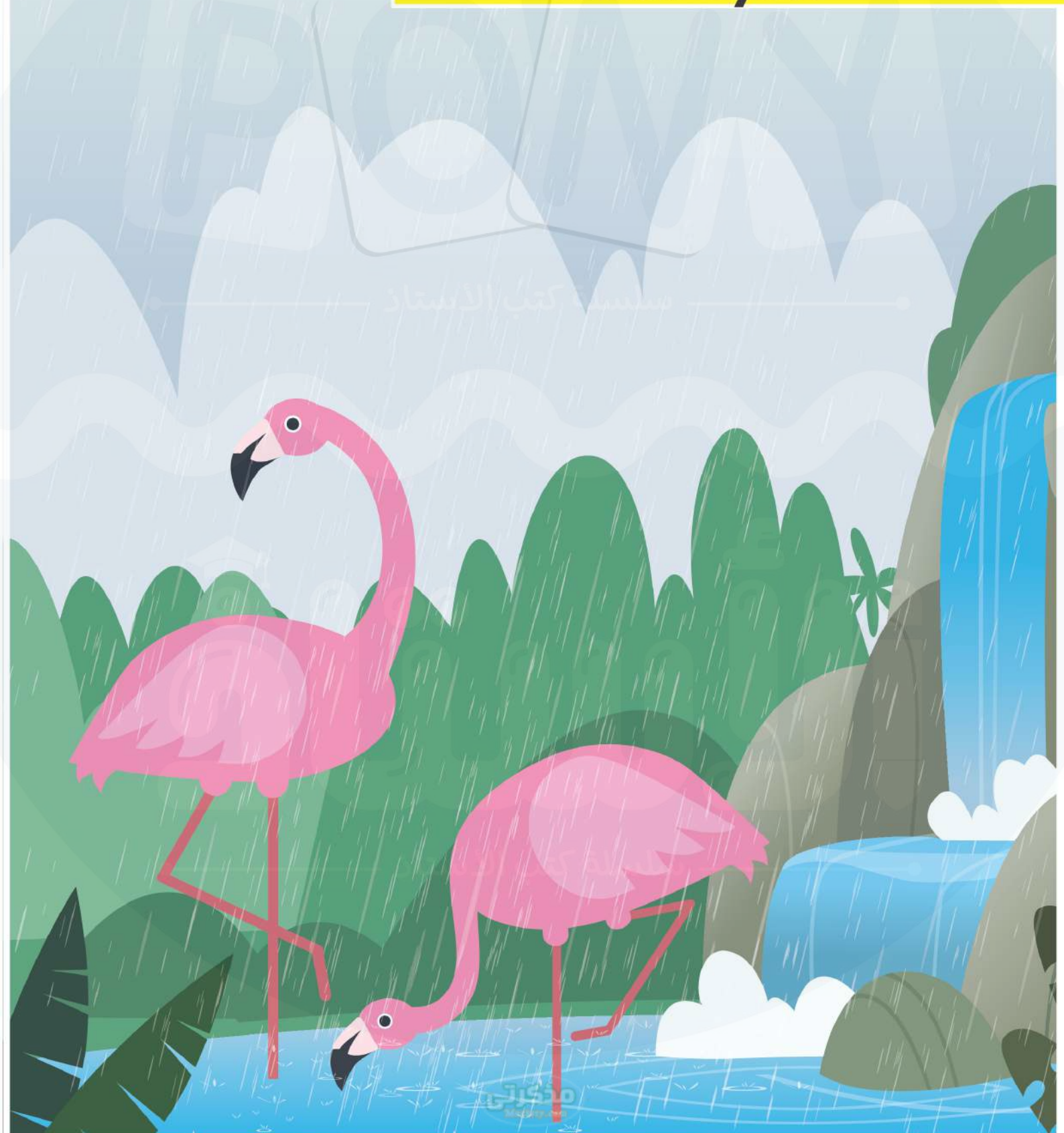


Concept

3.1

Energy Transfer in the Water Cycle



Concept 1

Energy Transfer in the Water Cycle

Lesson 1

- | | |
|------------|--|
| Activity 1 | Can You Explain? |
| Activity 2 | Dropping Water Levels |
| Activity 3 | What Do You Already Know About Energy Transfer in the Water Cycle? |

Lesson 2

- | | |
|------------|---|
| Activity 4 | How Do Solar Energy and Gravity Drive the Processes of the Water Cycle? |
| Activity 5 | Energy and Water |

Lesson 3

- | | |
|------------|-------------------------------------|
| Activity 6 | Energy Transfer and the Water Cycle |
| Activity 7 | Water Cycle Model |
| Activity 8 | The Heating of Earth |

Lesson 4

- | | |
|-------------|--|
| Activity 9 | Convection Currents and the Water Cycle |
| Activity 10 | Earth's Wind |
| Activity 11 | Record Evidence Like a Scientist: Energy Energy in the Water Cycle |

Glossary



Concept (3.1)

Lesson (1)					
Puddle	بركة صغيرة	Migrate	يهاجر	Precipitation	تساقط أو هطول
Water cycle	دورة الماء	Breed	تكاثر	Fog	ضباب
Energy transfer	انتقال الطاقة	Algae	الطحالب	Mountainside	سفح الجبل
Melt	ينصهر	Drought	الجفاف	Solar radiation	إشعاع شمسي
Evaporate	يتبخر	Regions	المناطق - أقاليم	Climatic zones	المناطق المناخية
Ocean currents	تيارات المحيط	Decades	عقود	Collection	التجميع
Colonies	المستعمرات	Rehabilitate	إعادة تأهيل	Shallow	ضحل
Flamingo	طائر الفلامنجو	Runoff	جريان المياه	Distribution	توزيع
Evaporation	التبخّر	Collection	تجمع	Unequal	غير متكافئ - غير متساوي
Condensation	التكثف	Flow	تدفق		

Lesson (2)					
Dry desert	صحراء جافة	Crystals	بلورات	Stomata	الثغور
Reservoirs	الخزانات	Droplets	قطرات	Moisture	رطوبة
Storage	تخزين	Streams	تيارات	Dust	تراب
Location	موقع	Elevation	ارتفاع	Pollens	حبوب اللقاح
Glaciers	الأنهار الجليدية	Percolate	ترشيح	Water vapor	بخار ماء
Heat (thermal) energy	طاقة حرارية	Groundwater	المياه الجوفية	Vital role	دور حيوي
Phase	مرحلة	Molecules	الجزيئات	Saturated	مُشبع
Gravity	الجاذبية	Absorb	تمتص	Smoke	دخان
Release	يطلق	Transpiration	النتح	Suitable	مناسبة

Lesson (3)					
Sleet	البرد	Circulation	الدوران	Contracts	ينكمش
Snow	ثلج	Gravitational force	قوة الجاذبية	Lighter than	أخف من
Hail	برد	Densities	كثافات	Perpendicular	عمودي
Convection	الحمل الحراري	Ocean currents	تيارات المحيط	Slanted	مائل
Radiation	إشعاع	Regional climates	المناخات الإقليمية	Convection currents	تيارات الحمل الحراري
Expands	يوسع	Location	موقع	Angle	زاوية
Denser	أكثر كثافة				

Lesson (4)					
Atmosphere	الجو	Latitudes	خطوط العرض	Global wind system	نظام الرياح العالمي
Rise	يرتفع	Descends	ينزل	Constant	ثابت
Sink	يهبط أو يغوص	Earth's mantle	الوشاح	Rotation	دوران

Lesson

1

Energy Transfe



Activity 1 Can You Explain?

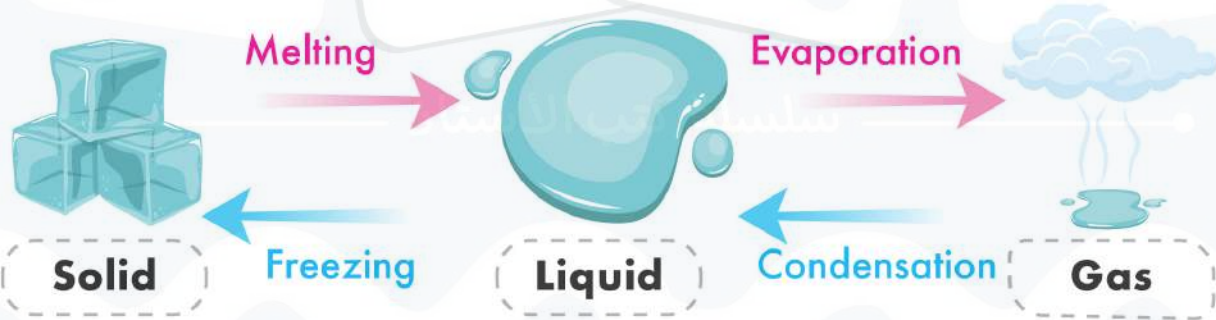
» Water exists in three states on Earth, which are:

- 1 Solid state (ice)
- 2 Liquid state (water)
- 3 Gas state (water vapor)

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



Concept 1



Melting and evaporation are processes that occur when water gain (absorb) thermal energy.

Freezing and condensation are processes that occur when water lose (release) thermal energy.

Example: Evaporation of water by the heat of the Sun:

The water in the small puddle is heated because it gains thermal energy from the Sun.

The water in the puddle evaporates and rises up.

The small puddle is dried up (disappeared).



Gain

يكتسب

Lose

يفقد

Puddle

بركة

The role of the Sun in the wa

- » The Sun is considered the most important source of energy that drives the water cycle.
- » The amount of water on Earth remains constant (doesn't change) due to the energy transfer in the water cycle.



- تعتبر الشمس أهم مصدر للطاقة حيث تؤثر في دورة الماء.
- تظل كمية المياه على الأرض ثابتة (لا تتغير) بسبب انتقال الطاقة في دورة الماء.

Sunlight provides the energy needed to:

Melt ice and change it into liquid water.



Evaporate water to form water vapor.



Generate wind movement.



- توليد الرياح.

- تبخر الماء السائل لتكوين بخار الماء.

• توفر الشمس الطاقة اللازمة لـ:
- لإنصهار الجليد و تكون الماء السائل.



- Winds cause **ocean currents** that transport water to different locations on Earth.

• تسبب الرياح حدوث التيارات المحيطية التي تنقل المياه لمواقع مختلفة على الأرض



Activity 2 Dropping Water Levels

- » The energy transfer during the water cycle causes increasing or decreasing water levels in some lakes, as follows:

Water levels in lakes **rise (increase)** due to the **precipitation process**.

Water levels in lakes **drop (decrease)** due to the **evaporation process**.

Concept 1

Example: Salt Lake in Turkey

- » There was a salt lake in Turkey that over time turned into a small puddle and then dried up completely in the summer.
- » This lake has hosted huge colonies of **flamingos**.



- كانت هناك بحيرة مالحة في تركيا، تحولت البحيرة بمرور الزمن إلى بركة صغيرة ثم جفت تماماً في فصل الصيف.
- استقبلت تلك البحيرة مستعمرات هائلة من طيور الفلامنجو.

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

تهاجر طيور الفلامنجو وتتكاثر عندما يكون الطقس دافئاً.



Flamingos

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

تتغذى طيور الفلامنجو على الطحالب الموجودة في المياه الضحلة للبحيرة.

- Scientists try to discover ways to conserve the ecosystem in this lake to protect it from climate change.

• يبحث العلماء عن طرق للحفاظ على النظام البيئي في تلك البحيرة لحمايتها من التغيرات المناخية.



Evaluate your learning!

» Put (✓) or (X):

- 1 The level of water of a salt lake in Turkey increases in hot summer. ()
- 2 Flamingos can feed on algae found in deep water. ()

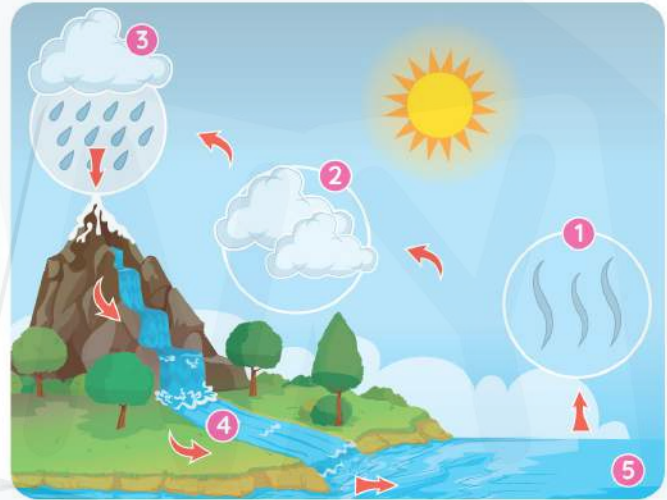
Activity

3

What Do You Already Know About Energy Transfer in the Water Cycle?

» In this activity, we will study the **processes** and **steps** that affect the water cycle, which are:

- 1 Evaporation Process
- 2 Condensation Process
- 3 Precipitation Process
- 4 Runoff
- 5 Collection



1 Evaporation

It is the process in which matter changes from a **liquid** state into a **gaseous** state.

2 Condensation

It is the process in which matter changes from a **gaseous** state into a **liquid** state.

3 Precipitation

It is the process in which water **falls** on the Earth's surface in the form of rain, sleet, hail, or snow.

4 Runoff

It is the step in which water **flows** along the Earth's surface into streams or rivers, then into the seas or oceans.

5 Collection

It is the step in which the water of rain is **collected** in different water bodies.

Evaporation

التبخّر

Runoff

الجريان السطحي

Sleet

قطرات مطر متجمدة

Condensation

التكثف

Collection

التجميع

Precipitation

الهطول

Use the word bank to complete the following

condensation

evaporation

precipitation

runoff

Concept 1



The snow falling on a cold afternoon represents



The fog forming over a field in the morning represents



A shallow river drying up represents



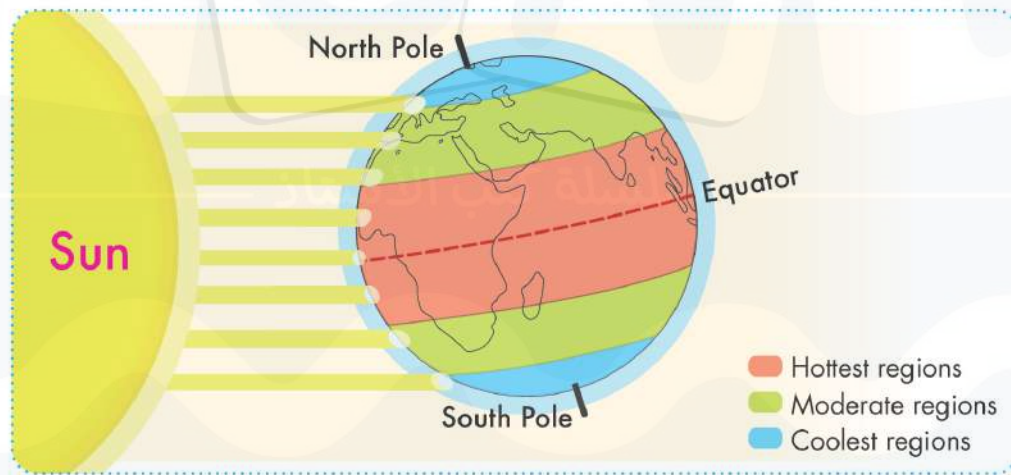
The water in a river traveling down a mountainside and into the sea represents

Fog	الضباب	Mountainside	سفح الجبل
Shallow	ضحل	Runoff	الجريان السطحي

Solar Energy Distribū

- » The amount of solar radiation that reaches any area on the Earth's surface is **unequal**.
- » The distribution of solar energy on the Earth's surface plays an important role in the **evaporation process** in the water cycle.

The following figure shows the distribution of solar energy on the Earth.



We can divide the Earth into three different climatic regions:

1 Hottest regions

- They are regions in which the evaporation process is the **greatest**.

2 Moderate regions

- They are regions in which the evaporation process is **moderate**.

3 Coolest regions

- They are regions in which the evaporation process is the **smallest**.



Evaluate your learning!

» Put (✓) or (X):

- The step that follows precipitation is called collection. ()
- The amount of solar radiation that reaches the Earth is equal. ()



Exercises on Lesson

Q1 Choose the correct answer:

- Drying up of a large salty lake in Turkey is due to the process.
 a. condensation b. precipitation c. evaporation d. melting
- Flamingos migrate to the large salty lake in Turkey when weather becomes, where they feed on
 a. cold – algae b. warm – algae c. warm – hawks d. cold – hawks
- All the following processes are involved in the water cycle, except
 a. evaporation b. filtration c. precipitation d. condensation
- What's the correct sequence of the three main processes of the water cycle?
 a. Evaporation → Precipitation → Condensation
 b. Evaporation → Condensation → Precipitation
 c. Condensation → Precipitation → Evaporation
 d. Condensation → Evaporation → Precipitation
- During the process, water changes from gas state into liquid state.
 a. evaporation b. melting c. precipitation d. condensation
- When water of a lake energy, the water level will
 a. gains – rises b. loses – increase
 c. gains – increase d. gains – decrease
- is the process in which water falls on Earth in the form of rain, sleet, snow or hail.
 a. Runoff b. Condensation c. Evaporation d. Precipitation
- In the water cycle, occurs due to the condensation process.
 a. formation of fogs b. falling of rain
 c. falling of snow d. melting of snow



- 9 In the water cycle, when rainwater running on Earth's rivers and seas, this describes the step of
a. condensation b. collection c. runoff d. precipitation
- 10 In the water cycle, the amount of that reaches the Earth affects the rate of evaporation of water in water bodies.
a. wind b. moonlight c. solar energy d. sound energy
- 11 In..... regions, the rate of evaporation would be the highest. (Qalyobia 2024)
a. moderate b. hottest c. coolest d. polar

Q2 Put (✓) or (X):

- 1 The large salt lake in Turkey dries up when the weather is cold. (Alex. 2024) ()
- 2 Flamingos migrate to a salty lake in Turkey when the weather is cold there. ()
- 3 Precipitation occurs after condensation of water vapor in the sky. (Ismailia 2024) ()
- 4 Runoff is the step in which water flows along the Earth's surface into a rivers and then into the ocean or the sea. (Qalyobia 2024) ()
- 5 Solar energy causes the liquid water in rivers to condense and turn into water vapor. ()
- 6 In the condensation process, water changes from a gaseous state into a liquid state. ()
- 7 In the water cycle, the step that follows the condensation process is runoff. (Cairo 2024) ()
- 8 In the water cycle, collection of rainwater in different water bodies occurs after it runs off on the Earth's surface. ()
- 9 In hottest regions, the rate of evaporation process is the greatest. (Alex. 2024) ()



Q3 Correct the underlined word:

- 1 In the water cycle, the step that follows the condensation process is runoff. (Cairo 2024) (.....)
- 2 Coldest regions are the regions that have the highest rate of evaporation process. (.....)
- 3 Falling of hail in the coolest regions is an example of the evaporation process. (Dakahlia 2024) (.....)
- 4 Drying up of water in the large salty lake in Turkey is due to the condensation process. (Dakahlia 2024) (.....)
- 5 Evaporation process precedes the precipitation process in the water cycle. (.....)
- 6 The level of the water in a lake will increase due to the evaporation process. (.....)

Q4 Write the scientific term of the following:

- 1 It is the main source of energy that affects the water cycle. (Gharbia 2024) (.....)
- 2 It is the process in which matter changes from liquid state to gas state. (Alex. 2024) (.....)
- 3 It is the process in which matter changes from gas state into liquid state. (.....)
- 4 It is the process in which water falls on Earth in the form of rain, snow, hail, or sleet. (.....)

Q5 Complete the following sentences:

- 1 The water level of a lake may increase or decrease due to losing or gaining
- 2 In the water cycle, when water runs through a river then to an ocean, this is called
- 3 Falling of heal or sleet on Earth is an example of process.



- 4 The change of water from the liquid state to the gas state is called (Dakahlia 2024)
- 5 In the early morning, fog is formed on a field as a result of process. (Kafr El Sheikh 2024)
- 6 Distribution of energy on the Earth's surface affects the evaporation process in the water cycle.

Q6 Choose from column (B) what suits column (A):

Column (A)	Column (B)
1 Precipitation	a. flowing of river's water into a sea. (Cairo 2024)
2 Condensation	b. falling of snow in an area. (Cairo 2024)
3 Evaporation	c. formation of fogs over a field in the morning. (Al-Azhar 2024)
4 Runoff	d. drying a shallow river. (Al-Azhar 2024)

- 1 2 3 4

Q7 Cross out the odd word:

- 1 Precipitation – Evaporation – Run off – Condensation (.....)
- 2 Rain – Sleet – Hail - Rivers (.....)

Q8 Give reasons for:

- 1 Drying up of a shallow lake in the summer season. (Alex. 2024)
.....
- 2 Formation of fog in the early morning. (Cairo 2024)
.....
- 3 Changing of water from one state to another. (Dakahlia 2024)
.....

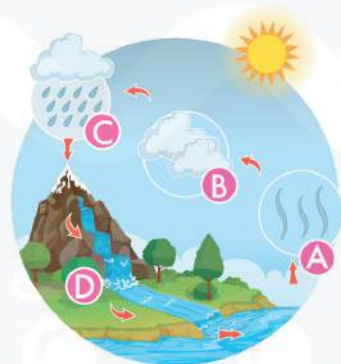
- 4 The distribution of solar energy on Earth's surface h
in the water cycle.

Q9 What happens to:

- 1 The level of water in a lake when the rate of evaporation increases?
(Gharbia 2024)
- 2 The state of water when the energy of the Sun heats up the liquid water
in water bodies?

Q10 Study the following figure, then answer the questions below:

- 1 This figure represents the
- 2 Label each process or step:
- a. Letter (A) represents
- b. Letter (B) represents
- c. Letter (C) represents
- d. Letter (D) represents



Q11 Study the following figure, then put (✓) or (X):

- 1 Region (A) has the greatest rate of evaporation process. ()
- 2 Region (C) is from the hottest areas on Earth. ()
- 3 The rate of evaporation in area (B) is lower than that of area (A). ()



Activity

4

How Do Solar Energy and Gravity Drive the Processes of the Water Cycle?

» In this activity, we will study the water cycle and the factors that affect it:

The Water Cycle

It's the continuous movement of water among the various

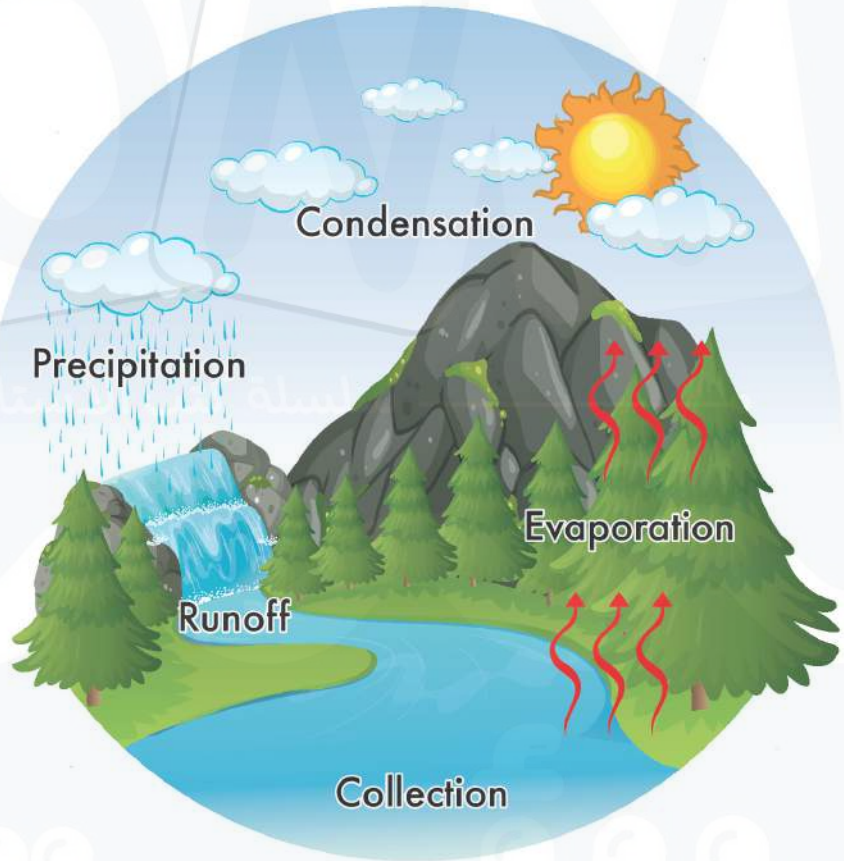
reservoirs.

دورة الماء: هي حركة المياه المستمرة في التجمعات المائية المختلفة.

A water reservoir

It's the storage location of water on Earth.

التجمع المائي: هو موقع لتخزين المياه على الأرض.



There are many Examples of reservoirs, such as:

Soil

التربة

Rocks

الصخور

Living organisms

الكائنات الحية

Atmosphere

الغلاف الجوي

Oceans and Seas

المحيطات والبحار

Rivers

الأنهار

Lakes

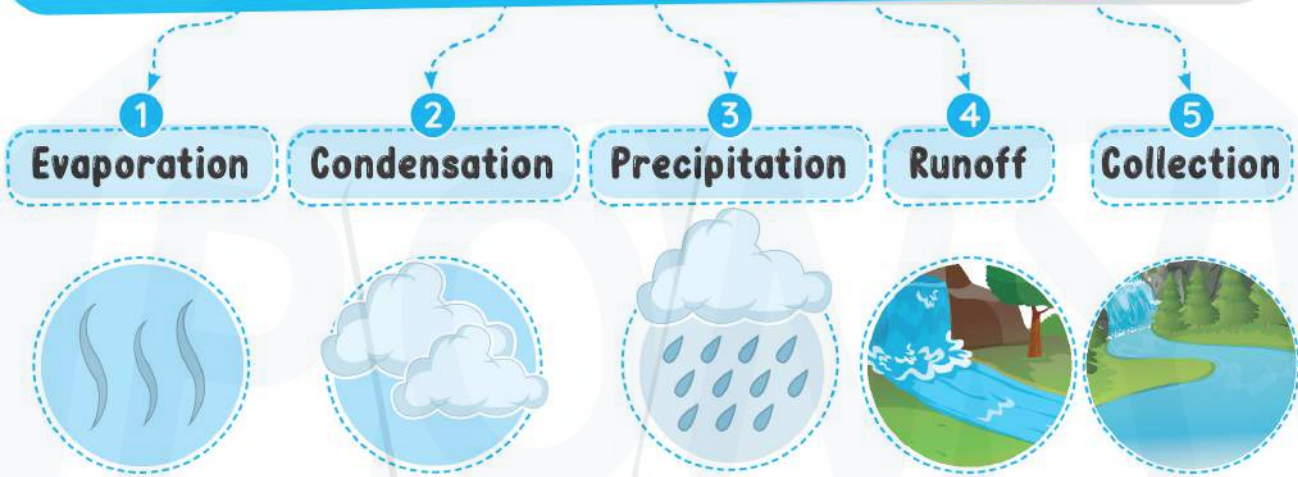
البحيرات

Glaciers

الأنهار الجليدية

Reservoirs

The main processes and steps that move water among water



Concept 1

• العمليات الرئيسية لنقل المياه بين تجمعات المياه هي: التبخر والتكثف والهطول والجريان السطحي والتجميع.

All the previous processes involve **force** and **energy**.

• كل عمليات انتقال المياه تشمل القوة والطاقة.

1 The role of energy in the water cycle:

The Sun:

- The Sun is the most important source of energy that affects the water cycle.
- Solar energy that comes from the Sun includes **thermal energy** that causes the change in the state of water.

When ice **gains** thermal energy

ice **melts** and changes into liquid water.

When liquid water **gains** thermal energy

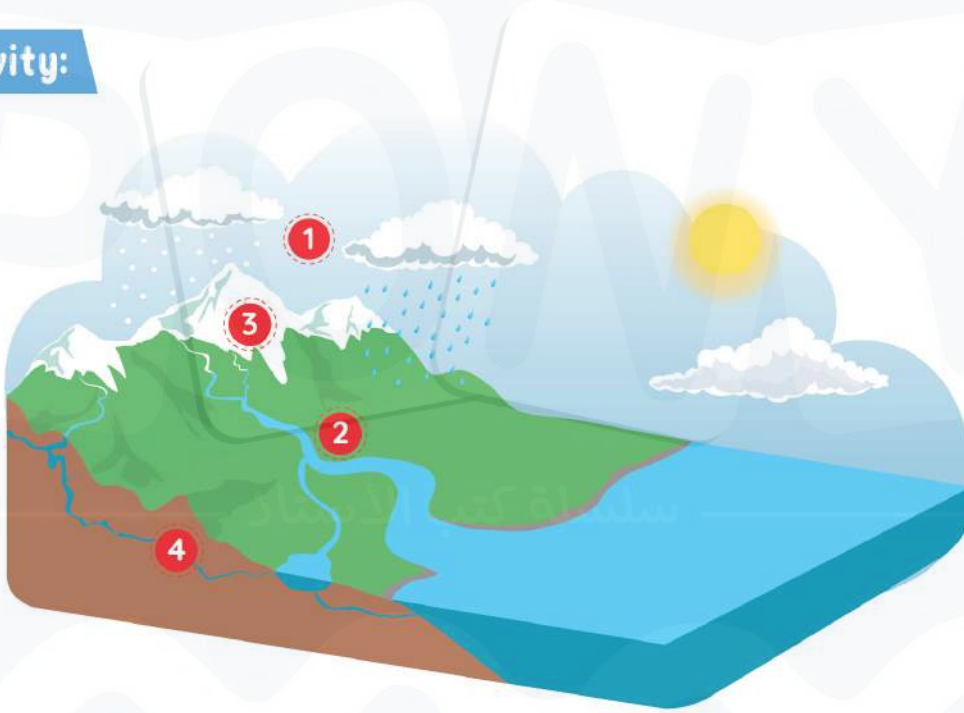
liquid water **evaporates** and changes into water vapor.

- الشمس هي المصدر الأهم للطاقة لتي تؤثر على دورة الماء.
- الطاقة الشمسية التي تأتي من الشمس تتضمن طاقة حرارية تسبب تغير حالة الماء.
- عندما يكتسب الثلج طاقة حرارية، يذوب الثلج و يتحول إلى ماء سائل.
- عندما يكتسب الماء السائل طاقة حرارية، يتبخر الماء السائل و يتحول إلى بخار الماء.

2 The role of force in the water cycle:

» Gravity and wind are the two forces that affect the water movement in water cycle:

A 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 (higher altitude) to **lower** elevation (lower altitude) where the ice melts and changes into liquid water to flow into other water bodies.

4 Gravity pulls liquid water causing its **leakage** into the ground, then to the groundwater reservoirs.

1 تسحب الجاذبية قطرات الماء و بلورات الجليد الموجودة في السحب مرة أخرى إلى سطح الأرض.

2 تسحب الجاذبية المياه السائلة إلى أسفل في الجداول و الأنهار نحو المسطحات المائية الأكبر.

3 تسحب الجاذبية الأنهار الجليدية من مناطق عالية الإرتفاع مناطق منخفضة الإرتفاع حيث ينصهر الثلج و يتحول إلى ماء سائل ليتدفق في مسطحات مائية أخرى.

4 تسحب الجاذبية المياه السائلة لتتسرب لباطن الأرض و منها إلى تجمعات المياه الجوفية.

B Wind:

Wind also causes the movement of water from one place to another as follow:

- » Wind moves **water vapor** from a place to another in the atmosphere.
- » Wind moves **clouds** from a place to another in the atmosphere.
- » Wind causes **ocean currents** that transport water to different locations on Earth.

- تتسبب الرياح في نقل المياه من مكان إلى آخر على النحو التالي:
 - تنقل الرياح بخار الماء من مكان إلى آخر في الغلاف الجوي
 - تنقل الرياح السحب من مكان إلى آخر في الغلاف الجوي.
 - تسبب الرياح حدوث التيارات المحيطية التي تنقل المياه إلى مواقع مختلفة على الأرض.

Thermal energy from the Sun and **gravity force** are the two main factors affecting the movement of water in the water cycle.

الطاقة الحرارية من الشمس وقوة الجاذبية هما العاملان الرئيسيان المؤثران على حركة المياه في دورة المياه.



Evaluate your learning!

» Put (✓) or (X):

- 1 The human body is considered a reservoir of water. ()
- 2 When ice of glaciers melts, it changes into water vapor. ()
- 3 Gravity is one of the main factors causing groundwater formation. ()
- 4 Gravity pulls glaciers from lower-altitude areas to higher-altitude areas. ()

Activity 5 Energy and Water

Put (✓) or (X):

- 1 Melting and freezing are opposite processes. ()
- 2 A small puddle may dry up in extreme hot weather. ()

We have learned that:

- Water changes from one state to another when it **gains** or **loses** thermal energy.
- **Gaining** or **losing** energy affects the water molecules in the air.

Melting, evaporation, and transpiration are processes that occur when matter **gain (absorb)** thermal energy.

Freezing and condensation are processes that occur when matter **lose (release)** thermal energy.

Evaporation

- 1 The Sun heats water in oceans, seas, lakes, rivers, and other water bodies.
- 2 This leads to the evaporation of **water** and changing it into **water vapor** due to **gaining** thermal energy.



1 تقوم الشمس بتسخين مياه المحيطات و البحار و البحيرات و الأنهار و المسطحات المائية الأخرى.

2 يؤدي ذلك إلى تبخر الماء و تحوله لبخار الماء و ذلك بسبب إكتسابه طاقة حرارية.

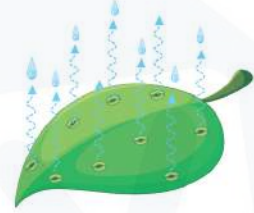
Transpiration

Transpiration

It is a type of evaporation that takes place through the **stomata** of the **plant's leaves**.

هي عملية تبخر الماء التي تحدث في الثغور الموجودة في أوراق النباتات.

Transpiration



Concept 1

- » About **10%** of the water vapor in the air comes from transpiration.
- » You can observe transpiration when you put a plant in a plastic bag and place it in sunlight. Where some water droplets are formed inside the bag.

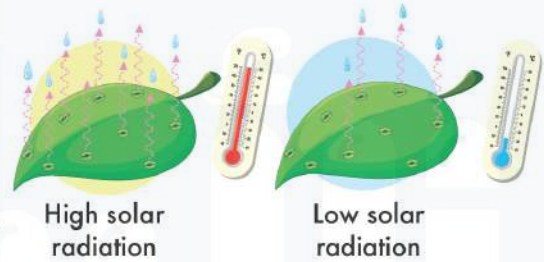


- ما يقرب من ١٠٪ من بخار الماء في الهواء من عملية النتح.
- يمكنك ملاحظة عملية النتح عند وضع نباتاً ملفوفاً بكيس بلاستيكي في الشمس.

The rate of transpiration depends on:

1 Solar radiation:

- The rate of transpiration increases when the amount of solar radiation increases.



2 Leaf size:

- Larger leaves have higher rates of transportation compared to smaller leaves.



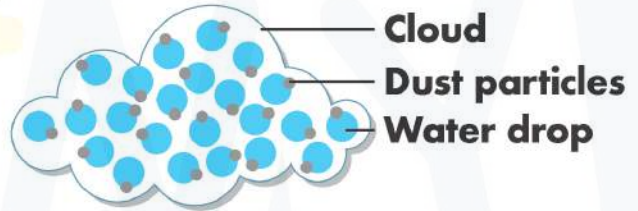
- يعتمد معدل النتح على:
- الإشعاع الشمسي: كلما زادت كمية الطاقة المنبعثة من الشمس كلما زادت عملية النتح..
 - حجم الأوراق: تتمتع الأوراق الكبيرة بمعدلات نتح أعلى مقارنة بالأوراق الصغيرة.

Condensation

- Condensation occurs when the saturated air that is full of water vapor cools.
 - As a result of cool temperatures, water vapor turns back into water droplets.
- يحدث التكثف عندما يبرد الهواء المشبع ببخار الماء. • نتيجة لدرجات الحرارة الباردة، يتحول بخار الماء مرة أخرى إلى قطرات الماء.

How clouds are formed?

- Clouds are formed due to the condensation process as follows:



- Water vapor in the air is cooled and condensed forming water droplets.
- Water droplets attach to the particles of dust, smoke, pollens, etc.
- When millions of these water droplets join together, they form clouds.

- تتكون السحب نتيجة لعملية التكثف على النحو التالي:
- يبرد بخار الماء في الهواء ويتكثف مكونًا قطرات الماء.
 - تلتصق قطرات الماء بجزيئات الغبار والدخان وحبوب اللقاح... إلخ.
 - عندما تتحد ملايين قطرات الماء هذه معًا، فإنها تشكل السحب.



- When the water droplets in clouds become too heavy, they fall in the form of rain that is called the precipitation process.
- عندما تصبح قطرات الماء في السحب ثقيلة جدًا فإنها تسقط على شكل مطر وهو ما يسمى بعملية الهطول.



Evaluate your learning!

Choose the suitable process (Evaporation - Condensation)

- Warm air rises and moves over cooler mountains. (.....)
- A puddle in a hot desert becomes smaller and smaller. (.....)
- Energy from the Sun heats the top layer of water in the sea. (.....)
- Warm, moist air touches a cold glass of water. (.....)

Exercises on Lesson

Q1 Choose the correct answer:

- 1 energy is the energy that drives the water cycle. (Giza 2024)
 a. Potential b. Solar c. Sound d. Electrical
- 2 All the following are water reservoirs, except (Alex. 2024)
 a. seas b. glaciers
 c. moon d. living organisms
- 3 When ice in glaciers melts,
 a. it is pulled upward by the force of gravity
 b. it turns into a gas state
 c. it flows from a lower elevation to a higher elevation
 d. it turns into liquid water
- 4 causes falling of ice in glaciers from a higher altitude to a lower altitude. (Kafr El Sheikh 2024)
 a. Evaporation b. Sunlight c. Gravity d. Wind
- 5 Leakage of water into groundwater reservoirs is due to the action of (Gharbia 2024)
 a. condensation b. gravity c. precipitation d. evaporation
- 6 Water vapor in the atmosphere can condense and form (Alex. 2024)
 a. air b. wind c. sunlight d. clouds
- 7 During the condensation process, all of the following occur except (Dakhlia 2024)
 a. losing energy b. gaining energy
 c. forming clouds d. converting water vapor into water
- 8 Clouds are formed due to the process. (Dakahlia 2024)
 a. melting. b. collection c. condensation. d. freezing.

- 9 Water vapor that is present in the air changes in: hits a cold bottle of water.
 a. gas state b. liquid water c. ice d. steam (Cairo 2024)
- 10 When water droplets in the air stick on particles of dust and smoke, they collect together forming
 a. glaciers b. water vapor c. clouds d. a runoff
- 11 All the following are forms of precipitation, except
 a. hail b. sleet c. clouds d. snow
- 12 All the following processes occur due to gaining or releasing thermal energy, except
 a. condensation b. evaporation c. melting d. precipitation
- 13 The evaporation of water from plant leaves is called (Cairo 2024)
 a. condensation b. transpiration c. collection d. respiration
- 14 Plants' leaves release during the transpiration process.
 a. oxygen gas b. water vapor
 c. carbon dioxide gas d. nitrogen gas
- 15 Thermal energy is released, when
 a. water vapor turns into water
 b. snow melts
 c. hail falls on Earth's surface
 d. liquid water turns into water vapor
- 16 Thermal energy is released during the process.
 a. evaporation b. melting
 c. condensation d. transpiration

Q2 Put (✓) or (X):

- 1 Water reservoirs on the Earth include Oceans and seas only. (Cairo 2024) ()
- 2 No energy transfer occurs during the water cycle. (Dakahlia 2024) ()
- 3 The human body is considered as a water reservoir. ()



- 4 The state of water changes when water gains or loses heat. (Damietta 2024) ()
- 5 When the Sun heats up water of a lake, it causes a precipitation process. ()
- 6 Glaciers are made of millions of tiny water droplets formed from condensation of water vapor found in air. ()
- 7 In water cycle, water moves from a place to another when a force affects it. ()
- 8 Air saturated with water vapor condenses at low temperatures. ()
- 9 When water vapor in the air is heated up, it turns into liquid water by the condensation process. ()
- 10 Melting and transpiration processes only occur by cooling. (Cairo 2024) ()
- 11 Glaciers move from the top of mountains to the bottom of mountains due to the effect of gravity. (Dakahlia 2024) ()
- 12 Freezing is the transformation of water vapor into liquid water droplets in the air. (Dakahlia 2024) ()
- 13 A plant with large leaves releases more water vapor during the transpiration process than that of small leaves if they are placed in the same place. ()
- 14 The force of gravity affects the movement of water in the water cycle. (Giza 2024) ()
- 15 Clouds are formed due to the melting process. (Alex. 2024) ()
- 16 During hot weather, the amount of water vapor released from plants' leaves increases. ()

13 Correct the underlined word:

- 1 Water vapor comes out from plant leaves through the respiration process. (Dakahlia 2024) (.....)



- 2 The change of water into water vapor is called the evaporation process. (.....)
- 3 The falling of water droplets in clouds back to Earth's surface is called the precipitation process. (.....)
- 4 Water is found in a liquid state in glaciers. (.....)
- 5 Glaciers are formed when water vapor rises up and cools in the air. (.....)
- 6 About 10% of water vapor in the air comes from animals during the transpiration process. (.....)
- 7 Water in oceans and seas turns into water vapor, when it loses thermal energy. (.....)

Q4 Write the scientific term:

- 1 It is the storage location of water on Earth, that including oceans, seas, lakes, and rivers. (Dakahlia 2024) (.....)
- 2 It is formed from millions of tiny water droplets that are condensed from water vapor in the sky. (Ismailia 2024) (.....)
- 3 It is a form of evaporation that takes place through the stomata, which are found in plant leaves. (Cairo, Giza 2024) (.....)
- 4 It is the process which helps in the formation of clouds in the sky. (Cairo 2024) (.....)
- 5 It is the transformation of water vapor into liquid water droplets in the air. (Dakahlia 2024) (.....)
- 6 It is the force that is responsible for the falling of different forms of precipitation on Earth's surface. (.....)

Q5 Complete the following sentences:

- 1 is the force that drives the water cycle. (Dakahlia 2024)
- 2 Water can be pulled downward by force. (Qalyobia 2024)
- 3 When in air hits a cold glass of juice it will condense. (Alex. 2024)



- 4 When rises up and cools, it form collect together forming
- 5 Flowing of rainwater downhill into streams or rivers occurs by the action of the force of
- 6 In condensation process, the water vapor thermal energy, and changes again into water. (Dakahlia 2024)
- 7 When the water droplets in clouds become too heavy, it causes process. (Cairo 2024)
- 8 When water changes from solid state to liquid it energy. (Alex. 2024)
- 9 is the main force that affects the movement of water in the water cycle. (Assiut 2024)
- 10 Melting of snow at a mountain top is due to the energy of the, while falling of snow from a high altitude to a lower altitude is due to the force of
- 11 Transpiration is a type of in plants. (Kafr El Sheikh 2024)
- 12 is a process carried out by plant leaves to get rid of excess water through stomata. (Dakahlia 2024)

Q6 Cross the odd word out:

- 1 Melting – Evaporation – Freezing – Transpiration
(Giza 2024) (.....)
- 2 Evaporation – Precipitation – Radiation – Condensation
(Dakahlia 2024) (.....)

Q7 Answer the following:

(Cairo 2024)

- 1 Mention the main factors in the water cycle:
 1.
 2.

- Mention the process that happens to water during condensation, mention if this process is accompanied by losing or gaining energy.

(Dakahlia 2024)

Q8 Give reasons for:

- Water flows in glaciers from a higher to a lower elevation area.

- About 10% of water vapor in air comes from plants.

(Al-Azhar 2024)

- Evaporation of water in seas and oceans in hot weather.

- Precipitation process occurs by the action of gravity force.

- Clouds are formed in the sky in cold weather.

Q9 What happens when:

- Warm moist air touches a cold glass of water?

- Water vapor rises up and cools at a top of a mountain?

- The clouds become so heavy that they can't hold water?

(Dakahlia 2024)

- Wrapping a plastic bag on plant's leaves and placing it in a sunny area?

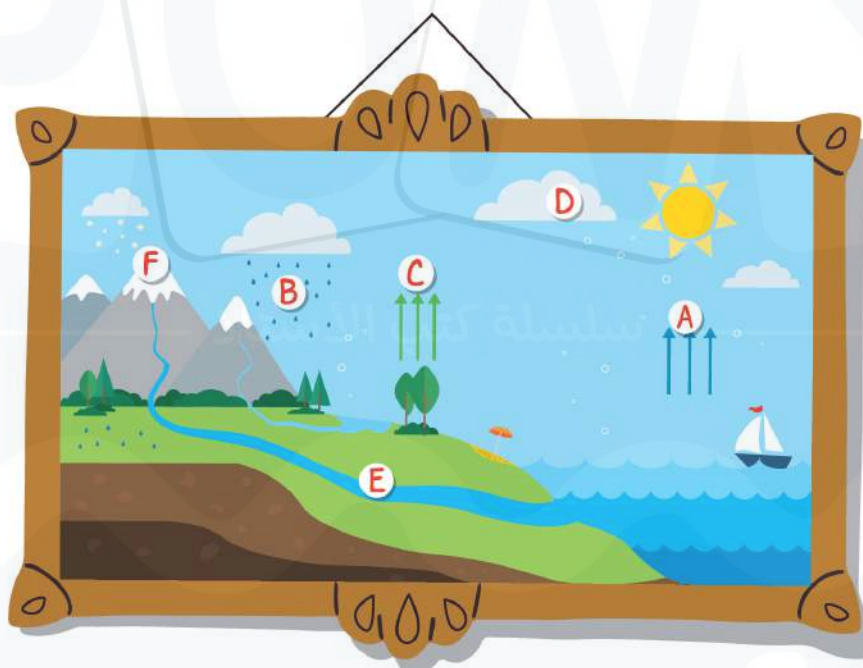
Q10 Look at the opposite figure then complete:

- The name of this process is
- This process produces about % of water vapor that found in the air.



Concept 1

Q11 Study the following figure, then choose the correct answer:



- Process (A) is called
 a. condensation b. precipitation c. evaporation
- Process (C) is called
 a. condensation b. precipitation c. transpiration
- Process (B) is called
 a. precipitation b. evaporation c. transpiration
- The force of pulls water downhill in the reservoir (E).
 a. magnetism b. gravity c. transpiration
- When the part (F) gains thermal energy, it changes into a state.
 a. solid b. gas c. liquid
- The formation of the part (D) is due to the process.
 a. condensation b. precipitation c. evaporation

Activity 6 Energy Transfer and the Water Cycle

- » Freshwater is found on Earth in rivers, some lakes, rain,etc
- » We can see the water falling as rain, but we can't see the water vapor in the air that forms the rain.

Importance of Fresh Water:

- » Humans, animals, and plants need fresh water to survive.
- » Green plants depend on rain to grow and survive.

The Water Cycle in Nature:

- » Nature recycles water through the water cycle, where water moves from water bodies to the atmosphere and then returns to Earth as rain.
- » There is no start point or end point for the water cycle.
- » The water cycle occurs everywhere on Earth, even in the desert.

- تقوم الطبيعة بإعادة تدوير الماء من خلال دورة الماء حيث ينتقل الماء من المسطحات المائية إلى الغلاف الجوي ثم يعود إلى الأرض على شكل أمطار.
- لا توجد نقطة بداية أو نقطة نهاية لدورة الماء.
- تحدث دورة المياه في كل مكان على الأرض، حتى في الصحراء.

Give reasons for:

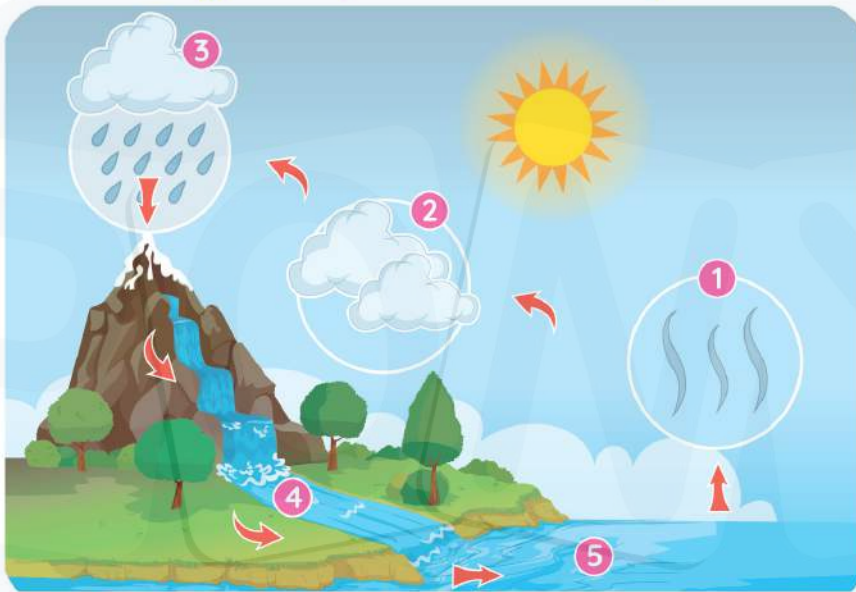
1 The water cycle is very important for life continuity.

- Because the water cycle provides water for all living organisms.
- Because the water cycle regulates the weather on Earth.

2 The total amount of water on Earth doesn't change.

- Because water can be renewed (replaced) through the water cycle.

Steps of Water Cycle



Concept 1

1 Evaporation:

- The Sun heats the liquid water of oceans, lakes, and rivers, so liquid water changes into **water vapor** and rises in the atmosphere.
- Plants also give off water vapor through **transpiration**.

2 Condensation:

• When water vapor **rises** into the atmosphere,



it **cools** and **condenses** forming clouds.

3 Precipitation:

• When water droplets in clouds become **too heavy**,



they fall 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.

What happens if:

1 The Sun heats up the water of oceans, lakes, and rivers?

- Liquid water will change into water vapor and rise in the atmosphere.

2 The water vapor rises into the atmosphere?

- The water vapor will be cooled and condensed into clouds.

3 Water droplets become too heavy in the clouds?

- Water droplets will fall in the form of precipitation.

4 Precipitation hits Earth?

- It may flow across the land as runoff and then it will be collected in different bodies of water.

» Heat can transfer by these ways which are:

- Conduction
- Convection
- Radiation

Convection

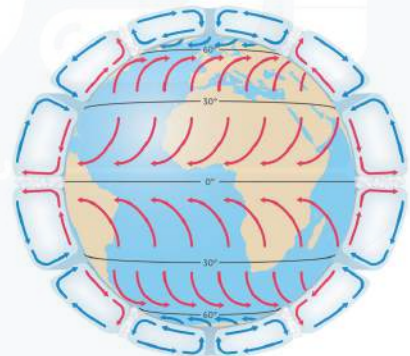
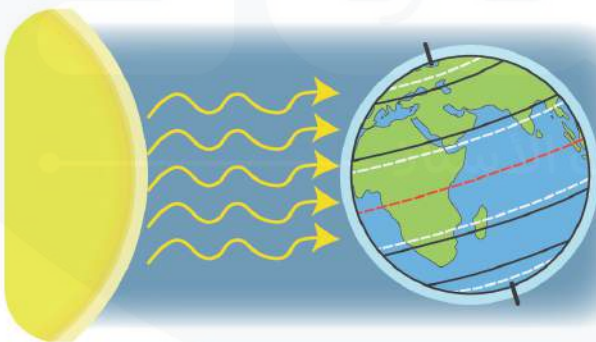
It is a process in which heat transfers in **liquids** and **gases**.

- The heat of the sun transfers through space to Earth's atmosphere through **radiation**.

- تنقل الحرارة من الشمس عبر الفضاء إلى الغلاف الجوي للأرض من خلال الإشعاع الحراري.

- Heat energy can transfer throughout the Earth's atmosphere through **convection**.

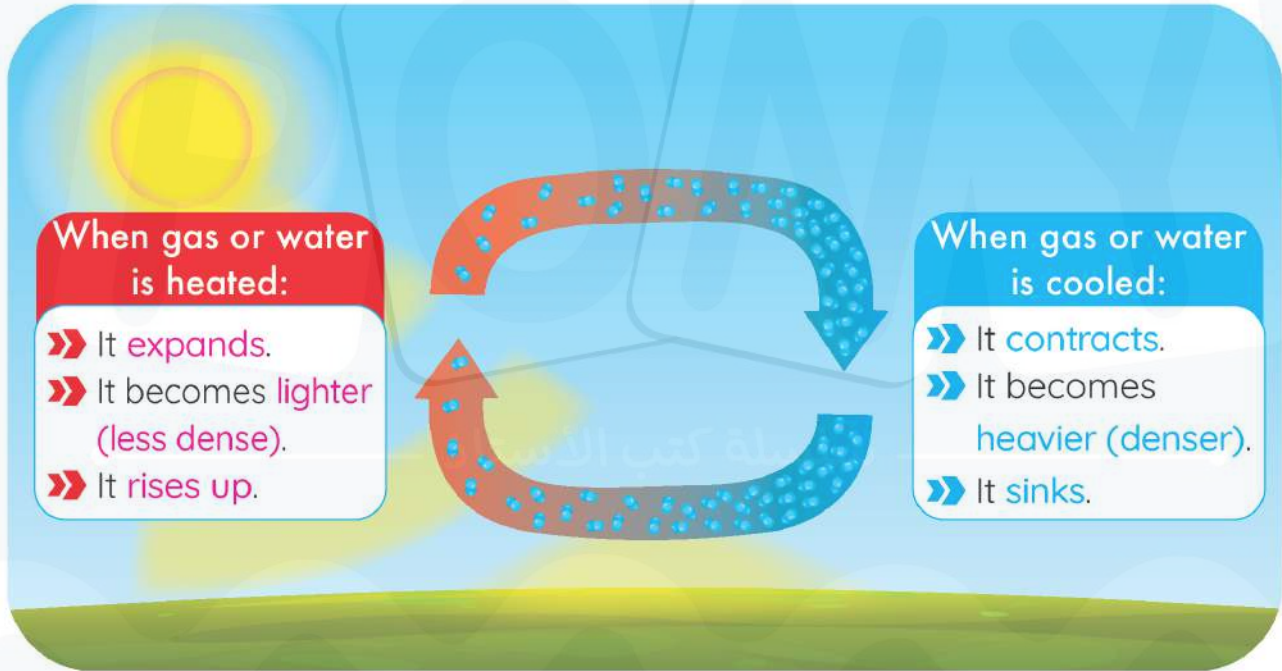
- تنتقل هذه الطاقة الحرارية عبر الغلاف الجوي للأرض من خلال الحمل الحراري.



Convection in Liquid and g

- » The unequal heating of land and oceans causes different **temperatures** and **densities** in the water of the ocean and atmosphere.

• يتسبب الارتفاع غير المتساوي لدرجات الحرارة على سطح الأرض وفي المحيطات في اختلاف الكثافة في المحيط والغلاف الجوي.



- » The rising of warm liquid or gas and the sinking of cold liquid or gas create a cycle of **convection currents**.
- » Gravity force helps in the rising and falling of different densities of liquid and gases, which causes the rotation of convection currents, which causes **wind** and **ocean currents**.

- يؤدي ارتفاع الهواء أو الماء الساخن وانخفاض الماء أو الهواء البارد لحدوث تيارات الحمل الحراري
- تسمح قوة الجاذبية بارتفاع وانخفاض الكثافات المختلفة، مما يؤدي لدوران تيارات الحمل الحراري التي تسبب حركة الرياح والتيارات المحيط



- Convection currents in Earth's atmosphere help in determining the regional climate.
- يساعد دوران تيارات الحمل الحراري على كوكب الأرض في تحديد طبيعة المناخ الأقليمي



The Relationship Between Convection and

As **warm, moist air** rises up by convection, it cools and condenses into water droplets. that join together, forming clouds

3

Unit

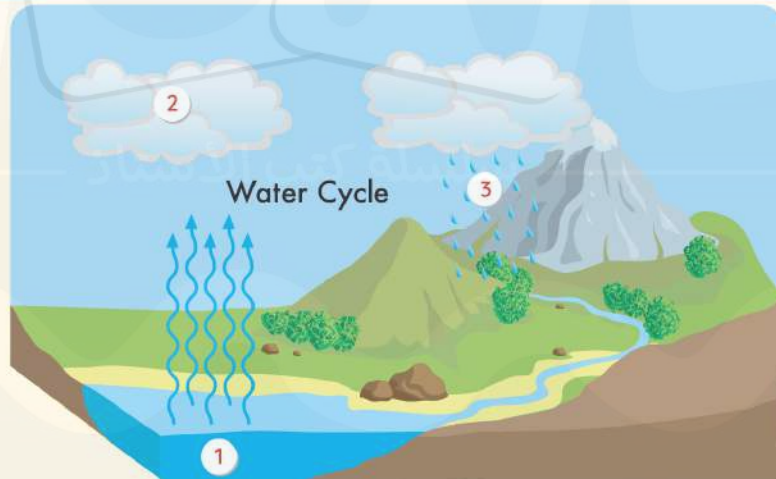
• العلاقة بين الحمل الحراري والتكثف:

- مع ارتفاع الهواء الدافئ والرطب عن طريق الحمل الحراري فإنه يبرد ويتكاثف مكونًا قطرات الماء التي تتجمع معًا مكونًا السحب.



Evaluate your learning!

Study the following figure, then choose the correct answer:

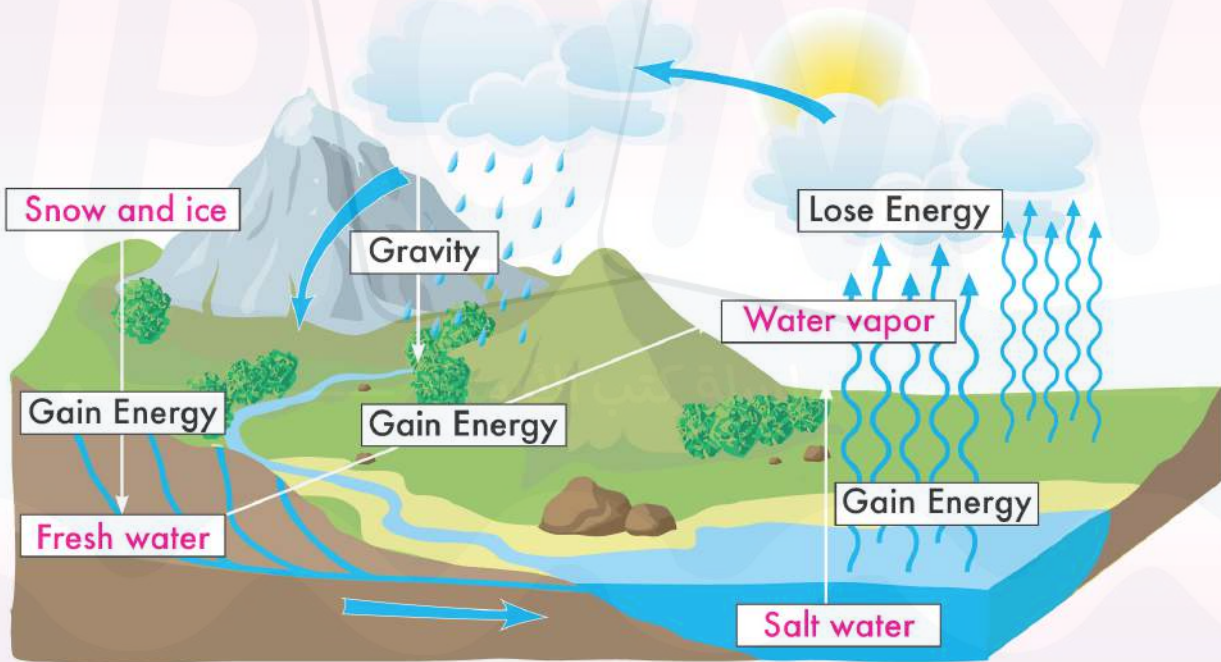


- 1 When the Sun heats the water in area ①, the water energy turns into
 - a. loses - water vapor
 - b. gains - water vapor
- 2 Part number ② is formed when water vapor energy and forms water droplets due to the process.
 - a. loses – condensation
 - b. loses – evaporation
- 3 When the water droplets in part number ② becomes heavy, process occurs by the effect of
 - a. precipitation – gravity
 - b. condensation - convection
- 4 When the water in part number ③ falls on Earth, it flows as a along the land, then is collected in the water body number ① by the effect of
 - a. steam – the Sun
 - b. runoff – gravity

Activity 7 Water Cycle Model

Water Cycle Model

Study the opposite figure, then answer the following question:



Concept 1

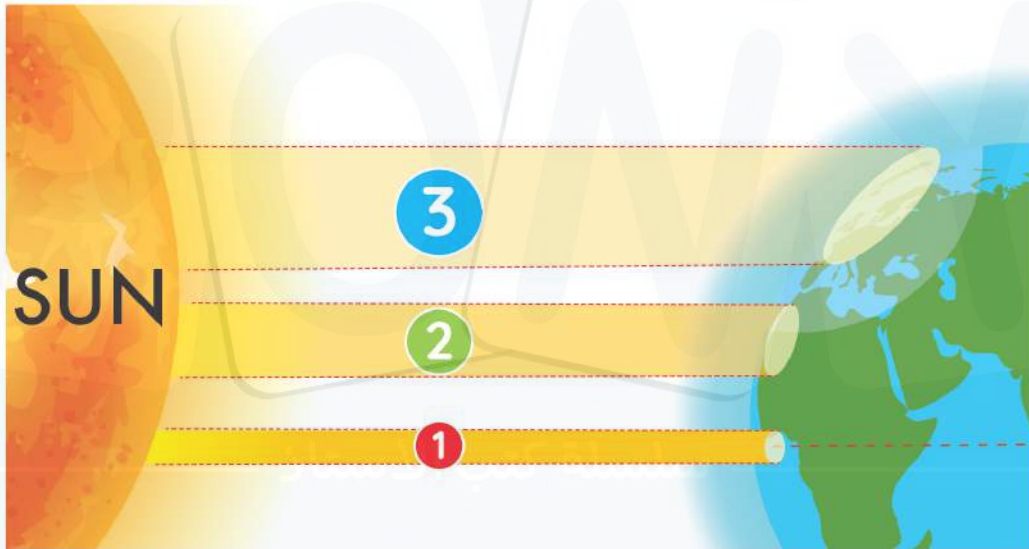
Complete the following sentences using the word bank:

Clouds salt water loses gravity condenses heated

- 1 When gains energy, it turns into water vapor.
- 2 When water vapor energy, it condenses into water droplets.
- 3 The force of causes rain to fall.
- 4 are formed from millions of tiny water droplets.
- 5 When a liquid or gas is, it becomes less dense and rises.

Activity 8 The Heating of Earth

- » The amount of solar radiation that reaches different areas on the Earth's surface is **unequal**.
- » The inclination of the sun rays on Earth affects the weather as follows:



1 When sunrays fall perpendicular to the Earth's surface in an area near the equator

The sunrays are concentrated on a **small** area

giving

high effect of heat

so

weather is **hot**.

2 When sunrays fall slanted (inclined) on an area in the north or south of the equator

The sunrays are distributed on a **large** area

giving

low effect of heat

so

weather is **warm**.

3 When sun rays fall very slanted (very inclined) on an area far away from the equator

The sunrays are distributed on a **very large** area

giving

lowest effect of heat

so

weather is **very cold**.

We can divide the Earth into three different

Region	Hottest Regions	Moderate Regions	Cooler Regions
Location:	They are areas near the equator	They are areas on north or south of the equator.	They are areas far away from equator
Sunrays:	Perpendicular on small area	Slanted (inclined) on large area	Very slanted (very inclined) on very large area.
Weather:	Hot and humid (wet)	Warm	Very cold
The Rate of Evaporation:	Highest	Moderate	Lowest



Evaluate your learning!

» Study the following figures, then put (✓) or (X):



Figure 1



Figure 2

- The flashlight represents the Sun in these figures. ()
- Globes in figure 1 and figure 2 receive the same amount of light. ()
- The rays of flashlight in figure 1 fall very slanted on the globe. ()
- The rays of the flashlight in figure 2 fall on a larger area than that in figure 1. ()
- The bright area on the globe in figure 2 becomes warmer than that in figure 1. ()

Exercises on Lesso

01 Choose the correct answer:

- 1 depend on fresh water to survive.

a. Plants only	b. Animals only
c. Humans only	d. All living organisms
- 2 In the water cycle, water returns back from the atmosphere to the Earth's surface through process in the form of

a. precipitation – water vapor	b. precipitation – rain
c. transpiration – sleet	d. condensation – snow
- 3 is a way of heat transfer through Earth's atmosphere.

a. Condensation	b. Evaporation	c. Convection	d. Conduction
-----------------	----------------	---------------	---------------
- 4 Heat transfers by convection in and (Alex. 2024)

a. liquids - space	b. gases - solids
c. solids - Liquids	d. liquids - gases
- 5 Convection is a way of transferring heat in liquids and gases due to the difference in their (Dakahlia 2024)

a. mass and color	b. shape and volume
c. temperature and size	d. temperature and density
- 6 air molecules move upward, while air molecules move downward.

a. Hot – lighter	b. Hot – colder	c. Cold – hotter	d. Cold – lighter
------------------	-----------------	------------------	-------------------
- 7 When air is heated, its changes. (Giza 2024)

a. mass	b. smell	c. color	d. density
---------	----------	----------	------------
- 8 Convection currents on Earth occur due to heating of land and in water bodies by the

a. equal - gravity	b. unequal - energy of the Sun
c. equal - energy of the Sun	d. unequal - wind



- 9 causes the air containing water loses its heat and turns into water droplets due to
- a. Convection – evaporation b. Condensation – convection
c. Evaporation – convection d. Convection – condensation
- 10 Areas that are far away from the equator, the sunrays fall
- (Dakahlia 2024)
- a. perpendicular b. very inclined
c. semi-inclined d. semi-slanted
- 11 As you go away from the equator,
- a. sunlight is distributed on a less area
b. sunlight is distributed on a greater are
c. precipitation rate increases d. the climate becomes more humid

Q2

Put (✓) or (X):

- 1 Humans can get fresh water from rivers and some lakes. ()
- 2 The water cycle plays a role in regulating weather on Earth's surface. ()
- 3 The amount of water on Earth always changes when water changes from a state to another. ()
- 4 The heat of the Sun transfers through space to Earth's atmosphere by convection. (Cairo 2024) ()
- 5 The density of air decreases by increasing its temperature. (Alex. 2024) ()
- 6 When the Sun heats up air, it falls down. ()
- 7 Cold air rises above hotter air. (Alex. 2024) ()
- 8 Convection causes movement of air with low density above the high-density air. (Dakahlia 2024) ()
- 9 Cold air has more density, so it moves down the hot air. ()
- 10 Fresh water is collected and stored underground by the effect of gravity. ()
- 11 Rain, steam, sleet, and hail are forms of precipitation. ()
- 12 In hot weather, water droplets in the air gain energy and turns into ice crystals. ()

- 13 The weather of the area near the equator is very ()
- 14 The areas in the south of the equator have warm weather, as sun rays fall semi-slanted on them. ()
- 15 Temperature increases when slanted sun rays are distributed over a large area. (Giza 2024) ()

Q3 Correct the underlined word:

- 1 Cold water has less density than warm water. (.....)
- 2 When water gains heat, it falls downward. (.....)
- 3 The weather is cold in the areas in the north of the equator. (.....)
- 4 In the areas near the equator, the sunrays are concentrated on a large area. (.....)
- 5 The weather near the equator is humid due to increasing the rate of the condensation process. (.....)
- 6 When frozen water melts, it loses energy. (.....)

Q4 Write the scientific term of the following:

- 1 It is the continuous movement of water between the Earth's surface and the atmosphere. (Giza 2024) (.....)
- 2 It is the method by which heat of the Sun transfers from space to Earth. (Giza 2024) (.....)
- 3 It is a way of heat transfer that occurs due to the rising and falling of molecules of liquid and gases with different densities. (.....)
- 4 It is a method by which heat transfers through the Earth's atmosphere. (.....)
- 5 It is the process in which water droplets in clouds fall on Earth's surface in the form of rain, snow, sleet, or hail. (.....)


Q5 Complete the following sentences:

- 1 In the water cycle, occurs when rainwater gather in different water bodies, such as streams and rivers.
- 2 Falling of hail on a mountain is an example of process.
- 3 Liquid water changes into, when it loses energy, while it changes into when it gains energy.
- 4 Heat is transferred through the atmosphere by (Alex. 2024)
- 5 Convection and force affect the movement of water through the water cycle. (Cairo 2024)
- 6 currents in Earth's helps in determining the regional climate.
- 7 Cold water has more than warm water. (Alex. 2024)
- 8 When hail or sleet fall on the Earth, they may flow along the land as a
- 9 Hot air rises up as it has density than cold air. (Gharbia 2024)
- 10 Convection currents occurring in atmosphere causes, while convection currents occurring in water bodies causes currents.
- 11 The weather in a certain area is, when sun rays fall perpendicular on it.

Q6 Give a reason for the following:

- 1 Hot air moves upward above cold air. (Alex. 2024)
.....
- 2 Convection current has an important role in the condensation process.
.....
- 3 The area near the equator is very hot. (Al-Azhar 2024)
.....

Q7 What happens:

1 To the density of cold air when it is warmed by the effect of solar energy? (Cairo 2024)

.....
.....

2 If the air near the Earth's surface when it is warmed? (Kafr El Sheikh 2024)

.....
.....

3 To the weather if sunrays fall very inclined on an area of Earth's surface? (Dakahlia 2024)

.....
.....

4 To the weather if sunrays fall semi-inclined on an area of Earth's surface?

.....
.....

Q8 Study the following figure, then complete the sentences below:

- 1 Sunrays fall perpendicular on the area (.....), so it causes a effect of heat.
- 2 The weather in area (B) is warmer than the weather in area (.....)
- 3 Sunrays fall semi-inclined in area (.....), while they fall very inclined on area (.....),



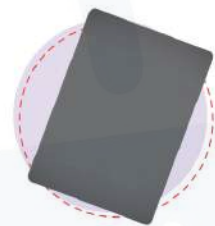
سلسلة كتب الاستاذ

Activity 9 Convection Currents and the Water Cycle

» In this activity we will do an experiment to show how **convection** and **gravity force** affect the water cycle.

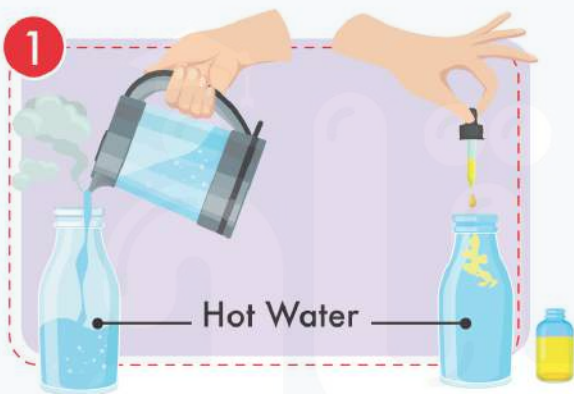
Concept 1

Tools:

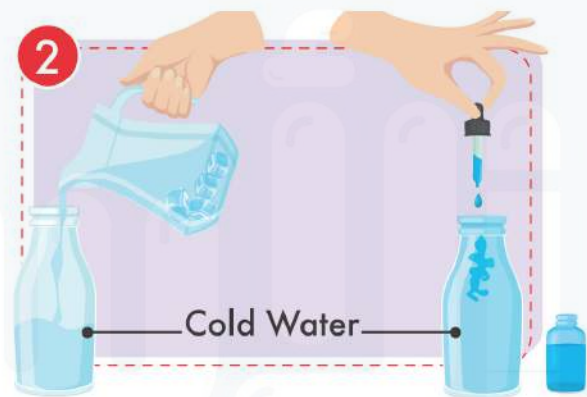


- 1 Two clear glass jars
- 2 Food coloring (Yellow and blue)
- 3 Hot and cold water
- 4 Thin sheet of plastic

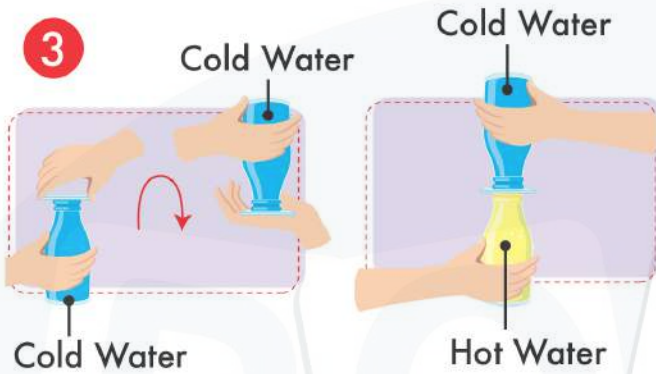
Steps - Part 1



- Fill the first jar with hot water, and then add three drops of the yellow food coloring.



- Fill the second jar with cold water, and then add three drops of the blue food coloring.



- Cover the cold jar with the card and invert it over the hot jar.



- Gently remove the card and observe what will happen.

Observation:

- The yellow and blue water mix, resulting in the formation of the green color.



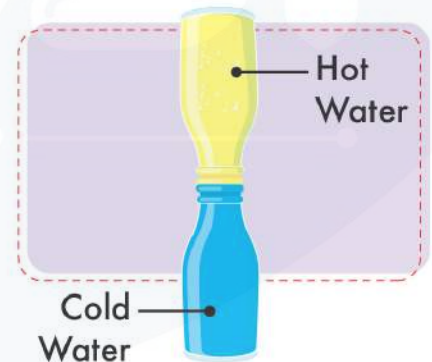
Steps - Part 2

- Repeat the experiment with the cold water on the bottom and the hot water on the top, then observe the difference.



Observation:

- The yellow and blue water do not mix.



Conclusion:

- **Convection currents** are the result of mixing hot water with cold water, in which:
 - Hot water is less dense, so it rises.
 - Cold water is more dense, so it sinks.
- Convection currents and gravity forces affect the movement of water in the water cycle.

Concept 1



Convection currents happen in the **atmosphere**, **water**, and **Earth's mantle**.



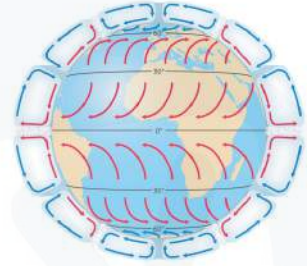
Evaluate your learning!

» Put (✓) or (X):

- 1 Hot air is denser than cold air. ()
- 2 Cold water molecules rise up. ()
- 3 When the air is warmed by the Sun, it falls down. ()
- 4 Gravity affects the movement of water in nature. ()

Activity 10 Earth's Wind

- » Earth has a **global wind system** that consists of winds that blow in a constant direction over long periods of time.
- » Wind is the main factor in determining **weather** and **climate**.
- » Any change in wind causes a change in weather because wind carries **heat, moisture, rain, snow, sand**, etc.



- تمتلك الأرض نظام رياح يشمل الكرة الأرضية، و يتكون من رياح تهب في اتجاه ثابت على مدى فترات طويلة من الزمن.
- تعتبر الرياح العامل الرئيسي في تحديد الطقس والمناخ.
- أي تغيير في الرياح يسبب تغيير في الطقس لأن الرياح تحمل الحرارة والرطوبة والمطر والثلج والرمال إلخ.

The wind direction is determined by two factors:

- 1 The rotation of the Earth.
- 2 The amount of solar radiation that reaches the Earth.



- يتم تحديد اتجاه الرياح من خلال عاملين هما:
 - 1 دوران الأرض.
 - 2 كمية الإشعاع الشمسي التي تصل الأرض.

What happens if...

There is no wind on the Earth?

- Some ecosystems will change completely, and others will disappear.
- The regions near the equator become extremely hot.
- The regions near the two poles will completely freeze.

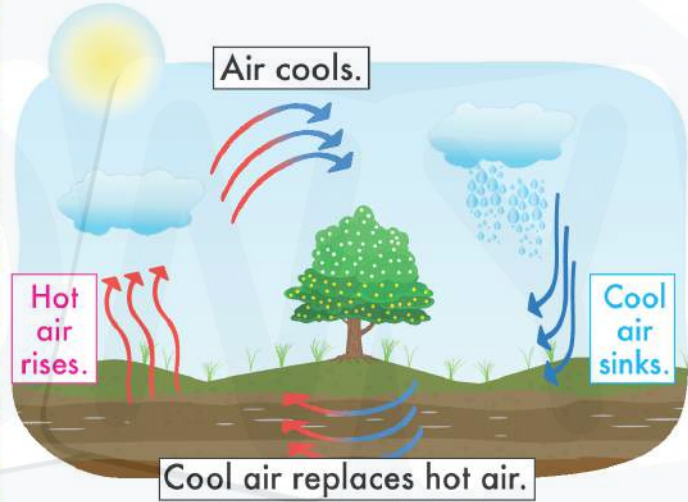
How does wind form

1 As warm, moist air rises,

- water vapor in the air **cools** and **condenses** into water droplets to form **clouds**.
- so the warm, moist air **loses** water in the form of rain.

2 As warm air is replaced by cooler air,

- This process generates **wind**.



Concept 1

3 The rising warm air that contains enough water vapor **loses** this water in the form of rain.

4 The descending cold air becomes **dry** when it reaches the Earth's surface.

5 The **dry air** forms a group (band) of **dry deserts** around the Earth.

- 1 عندما يرتفع الهواء الدافئ الرطب لأعلى، - فإنه يبرد و يتكثف مكوناً قطرات الماء التي تكون السحب.
- 2 عندما يحل الهواء البارد محل الهواء الدافئ فإن هذه العملية تسبب تولد الرياح.
- 3 الهواء الدافئ المتصاعد لأعلى يحتوى على كمية كبيرة من بخار الماء، حيث يفقد هذا الماء على هيئة مطر.
- 4 الهواء البارد المتساقط يصبح جافاً عندما يصل لسطح الأرض.
- 5 يشكل الهواء الجاف مجموعه من الصحارى على كوكب الأرض.



Evaluate your learning!

Put (✓) or (X):

- 1 Humid air forms a group of deserts on Earth. ()
- 2 The direction of wind is determined by Earth's rotation. ()

Activity

11

Record Evidence Like a Scientist
Energy Transfer in the Water Cycle

Unit
3

Now that you have learnt about energy transfer in the water cycle, look again at Dropping Water Levels. You first saw these in Wonder.



Question:

How can you describe Dropping Water Levels now?



My Claim:



Evidence:



Scientific Explanation with Reasoning:



Exercises on Lesson

Q1 Choose the correct answer:

- On heating some water, hot water molecules with moves
 - higher density – upward
 - less density – downward
 - more density – downward
 - less density – upward
- Due to convection, air moves upward above air. (Damietta 2024)
 - cold - hot
 - hot - cold
 - cold - warm
 - warm - hot
- is/are formed when cooler air flows under the air that rises up when it is warmed by solar radiation.
 - Ocean currents
 - A glacier
 - Gravity
 - Wind
- affect(s) the weather conditions as they carry heat, moisture and rain.
 - Winds
 - Rivers
 - Clouds
 - Oceans
- When warm air is , it
 - warmed – descends
 - cooled - descends
 - frozen – rises up
 - cooled – rises up
- When warm air has an enough amount of water vapor while it rises up, it and turns into
 - evaporates – water droplets
 - condenses – steam
 - condenses – water droplets
 - precipitate – sleet
- Wind is produced by the help of..... . (Gharbia 2024)
 - water turbine
 - electric generator
 - solar radiation
 - electric motor
- When there's no wind on Earth, the areas around the equator would be extremely , and the areas at the poles would be extremely
 - hot – hot
 - cold – hot
 - cold – frozen
 - hot - frozen

- 9 Deserts are formed, when rea
- | | |
|--------------|----------------------------|
| a. humid air | b. dry air |
| c. moist air | d. air carries water vapor |

Q2 Put (✓) or (X):

- 1 Wind plays an important role in moving water in nature. (Dakahlia 2024) ()
- 2 Rotation of the Earth doesn't affect the wind direction. ()
- 3 Hot air always replaces cold air. ()
- 4 Wind is formed due to the unequal heating of the Earth's surface by the solar radiation. ()
- 5 When warm air is cooled, it moves downward. ()
- 6 Wind is created when warm water rises up and is replaced by cold water. ()
- 7 Wind can carry different forms of precipitation. ()
- 8 Cold air rises above hotter air. (Alex. 2024) ()
- 9 From the factors that determine the wind direction is the amount of solar radiation that reaches the Earth. (Qalyobia 2024) ()
- 10 If there's no wind on Earth, some ecosystems may change or disappear. ()
- 11 Wind affects the climate of different regions around the world. ()

Q3 Write the scientific term:

- 1 It is the main factor that determines weather and climate. (.....)
- 2 It is created when air warmed by the Sun is replaced by a cooler air form a nearby area. (.....)
- 3 It is a large area of land which are formed due to the effect of dry air. (Cairo 2024) (.....)



Q4 Complete the following sentences:

- 1 is created when rises up and is replaced by cold air from a nearby area on Earth.
- 2 When warm air contains enough water vapor, it loses it on rising up in the form of (Al-Azhar 2024)
- 3 Dry air causes the formation of large areas of around the Earth's surface. (Cairo 2024)
- 4 The global wind system of the Earth consists of that blow at a constant over long periods of time. (Al-Azhar 2024)
- 5 The direction of wind is determined by the amount of received by the Earth and of the Earth. (Al-Azhar 2024)

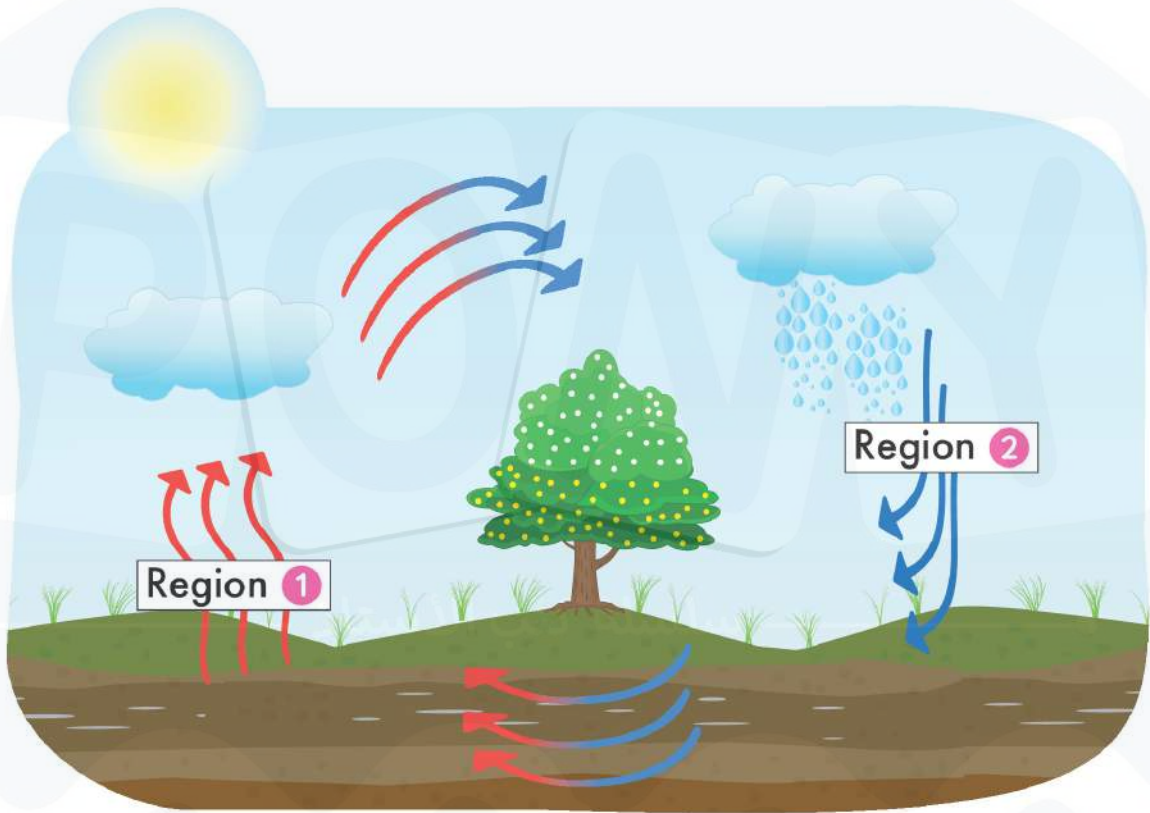
Q5 Give reasons for:

- 1 Weather conditions depend on the wind.
.....
.....
- 2 In convection currents, cold air descends and warm air rises.
.....
.....
- 3 Wind helps in the transporting of water through the water cycle.
.....
.....

Q6 What happens:

- 1 To the air temperature if there is no wind on Earth? (Dakahlia 2024)
.....
- 2 If dry air reaches the Earth's surface?
.....

07 Look at the following figure, then complete the fo



- 1 The air in region ① rises up because its density ,
when it energy from the
- 2 The air in region ② descends because its density ,
when it energy.
- 3 is generated when air in region ① rises up, it is
replaced by air from region ②.
- 4 Cloud are formed when air that has an enough amount of
..... condenses, and loses it in the form of rain.