Theme (I) systems
Unit (I) interaction of organisms

Concept one

Food relationships among living organisms

الوحدة الاولي العلاقات الغذائية بين الكائنات الحية

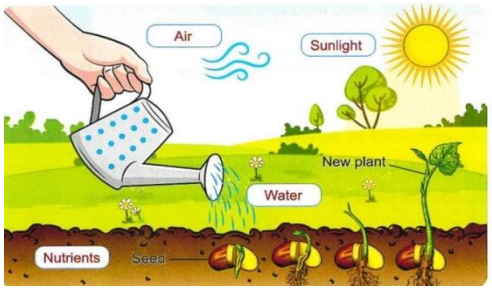
Concept 1.1

Lesson (I) Plant needs

Activity 1

Plant needs احتياجات النبات

Water –Sunlight- Space -Soil



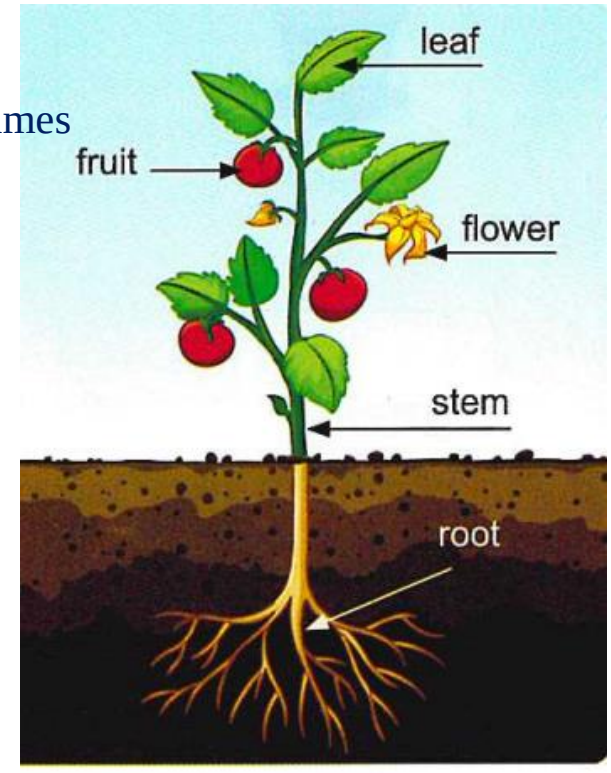
A plant is a living organism, like a human
النبات كائن حي، مثل الإنسان

Plants need, water sunlight, and space, and soil to grow.
تحتاج النباتات إلى الماء وضوء الشمس والفضاء والتربة لتنمو

To carry out its vital processes like (Photosynthesis process)
للقيام بعملياتها الحيوية مثل (عملية التمثيل الضوئي)

Plant structure تركيب النبات

The plant consists of
the roots , stems , leaves , and sometimes flowers or fruits .
يتكون النبات من الجذور والسيقان والأوراق وأحيانًا الازهار أو الثمار



Plant parts

Activity 2

Tree Needs The needs of plants and animals for growth

احتياجات النباتات والحيوانات اللازمة للنمو

Human	Plant
Humans and other animals need to eat food to gain energy and nutrients to live and grow. يحتاج البشر والحيوانات الأخرى إلى تناول الطعام للحصول على الطاقة والعناصر الغذائية للعيش والنمو	• Most plants get nutrients from the soil and make their own food through a process known as "photosynthesis process" that takes place in the plant leaves. • تحصل معظم النباتات على المغذيات من التربة وتصنع طعامها من خلال عملية التمثيل الضوئي. التي تحدث في أوراق النبات;عملية تعرف باسم

Plants and food

• Plants make their own food which is a type of sugar that provides the plant with energy to grow.

• تصنع النباتات طعامها الخاص وهو نوع من السكر يمد النبات بالطاقة للنمو.

• Plants make their food (sugar) in their leaves by means of photosynthesis process, where :

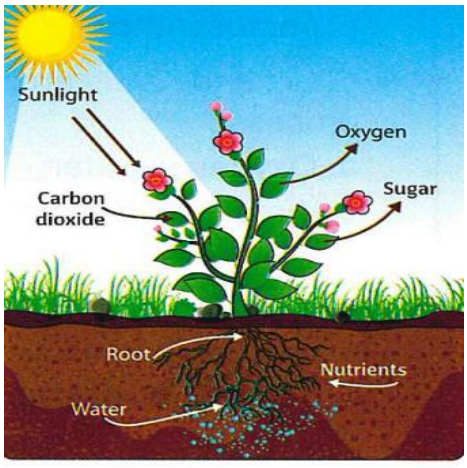
• تصنع النباتات طعامها (السكر) في أوراقها عن طريق عملية التمثيل الضوئي ، حيث:

The roots of a plant absorb water and nutrients from the soil.

- تمتص جذور النبات الماء والمواد المغذية من التربة.

the stem carry water and nutrients from the roots to the leaves.

الساق يحمل الماء والمواد المغذية من الجذور إلى الأوراق.



Photosynthesis process

• the plant's basic needs that enable it to make its food are:

- Sunlight - Water- Air (carbon dioxide).

▷ **Classify the following items into "Basic plant need for photosynthesis" or "Not basic plant need for photosynthesis":**

(Water-Sunlight - Oxygen - Sugar - A forest - Carbon dioxide)

Basic plant need for photosynthesis	Not basic plant need for photosynthesis
....	....

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
photosynthesis process	عملية التمثيل الضوئي	stems	السيقان
nutrients	المغذيات	roots	الجذور
water	الماء	flowers	الازهار
sunlight	ضوء الشمس	fruits	الثمار
space	الفضاء	leaves	الأوراق
Basic plant need	الاحتياجات الأساسية للنبات	Sunlight	ضوء الشمس
Not Basic plant need	ليست حاجة أساسية للنبات	sugar	السكر
		living organism	كائن حي

Exercises on Lesson (1)

1-Choose the correct answer?

1.All the following are plant basic needs to make its own food
a water b. air c. sunlight d. rocks

2. The ……of plant get water and nutrients from the soil
a. roots b. stems c. leaves d. flowers

3. Humans and other animals need to eat to get
a. oxygen gas b. energy c. carbon dioxide gas d. soil

4. Plants make their food by a process known as
a. respiration. b. absorption c. photosynthesis d. digestion

5. ……and…….. are from the plant needs that help it make photosynthesis
a. Oxygen-water b. Sunlight-carbon dioxide
c. Water-earth worms d. Nutrients-oxygen

6. Plants and humans are similar in some of their basic needs to survive such as……
a. sunlight and rocks b. water and air
c. carbon dioxide and soil, d. soil and water

7.Plants take…… from the air to make its food
a water b. oxygen gas c. carbon dioxide gas d. sugar

8.Which of the following sentences is wrong
a. Plants need sunlight to grow b. Plant roots absorb water from the soil
c. Plants make their own food by respiration process
d. Plants make their own food in their leaves

9. Water and nutrients are carried from the roots to the leaves through the
a. stem b. soil c. fruits d. flowers

10. In photosynthesis process, plant produces…… to get energy
a. oxygen gas b. sugar c. carbon dioxide d. water

2. Put (√) or (X)

1. Plants need water and air only to grow ( )
2. All plants have roots, stems and leave ( )
3. Each part of the plant has its own function ( )
4. Stem of the plant absorbs water from the soil ( )
5.Human, animals and plants need food and water to survive ( )
6. Plants use the energy of the sunlight to make their own food ( )
7. Carbon dioxide gas is one of the plant needs that helps it to grow and survive (
8. Photosynthesis process takes place in the plant roots ( )
9.The plant can make its own food in the absence of water ( )
10. Plants have unique structures that help them make their own food using sunlight( )

3.Complete the following sentences:

1. Different plants have three main common structures which are stem…… and ……
2. Plants absorb …….and……. from the soil through their……
3. Plants make their own food through ……process that takes place in their……..
4. The stem carries water and nutrients from……..to……. of the plant.
5. The plants use the light of ……..to make their own food
6. The food of plant is a type of…… which is made in their.....by photosynthesis process
7. Soil is the source of ……and nutrients which the plant need to make its own food
8. Some plants may not depend on..... as they grow in the water

4. Write the scientific term of each of the following

1. A gas taken from the air by leaves to help the plant to make its (…….)
2. A liquid substance that plants, animals and human need to survive(…….)
3. A part of the plant that carries water and nutrients from the roots to the leaves(…….)
4. The process by which plant can make its own food (…….)
5. The gas which is released from plants during photosynthesis (…….)
6. The source of energy that the plant use to make photosynthesis (…….)

5.Cross out the odd word

1. Carbon dioxide gas-Water- Oxygen gas-Sunlight
2. Roots-Stems-Leaves-Sunlight

6-Give reasons for

1. Roots have important role in photosynthesis process of plants

……

2. Photosynthesis process is important for plants to survive

……

3. Some plants don't need soil as a basic need

……

7-What happens if

1. Plants have no stems

……

2. Plants can't get carbon dioxide gas from air

……

3. We put a green plant in a dark room for many days

……

8- Choose from column (B) what suits it in column (A)

(A)	(B)
1. Sunlight	a. is absorbed by the roots of the plant.
2. Soil	b. is necessary for plant's growth
3. Water	c. is not a basic need for plant growth
4. Oxygen	d. a gas which is produced during photosynthesis process
	e. a gas which is the plant uses during photosynthesis process

1. ……. 2. ……. 3. ……. 4. …….

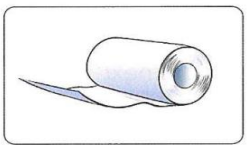
Lesson (2) Do Plant need soil ?

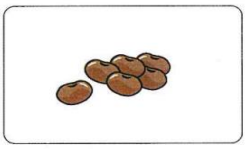
Plants and food:

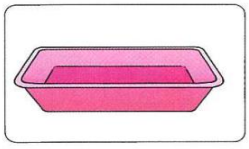
we will germinate some seeds in a wet paper towel, measure their growth and then compare their growth to the growth of the other seeds which are placed in soil

Tools

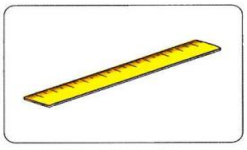

Plastic cup contains soil


Paper towels

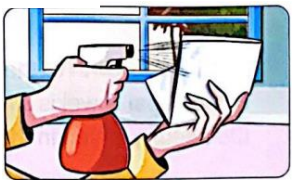

Six bean seeds (Fava beans)


Plastic plate


Water


Metric ruler

Steps



1. Use the water to wet the seeds
استخدم الماء لتبليل البذور

2. Place three seeds in the top half of the paper towel and fold the bottom hall of the towel up so that it covers the seeds then, place the paper towel side the plastic plate
ضع ثلاث بذور في النصف العلوي من منشفة ورقية وقم بطي القاعة السفلية للمنشفة لأعلى بحيث تغطي البذور ، ثم ضع المنشفة الورقية بجانب الطبق البلاستيكي

3. Plant the other three seeds in the cup that contains potting soil then, water the seeds3
ازرع البذور الثلاثة الأخرى في الكوب الذي يحتوي على تربة أصيص ثم أسقي البذور

4. Place the plate and the cup in a place where they can get sunlight
ضع الطبق والكوب في مكان يمكن أن يتعرضوا فيه لأشعة الشمس

5. Check the growth of seeds over the next several days. Wet the paper towel and water the soil as needed. .
بلل المنشفة الورقية وسقي التربة حسب الحاجة .تحقق من نمو البذور خلال الأيام العديدة القادمة .

6. Measure the growth of each seed using the metric ruler.
قم بقياس نمو كل بذرة باستخدام المسطرة المترية .


After 7 days


After 14 days

Observations-The initial growth of the seeds placed in the paper towel is similar to that of the seeds planted in the soil.

ملاحظات - النمو الأولي للبذور الموضوعة في المنشفة الورقية مشابه لنمو البذور المزروعة في التربة.

-The seeds grown without soil would not grow as quickly as the seeds in the soil.

- البذور المزروعة بدون تربة لن تنمو بسرعة مثل البذور الموجودة في التربة.

► Conclusions

1. The seeds can grow without soil if they have water and Sun.

يمكن أن تنمو البذور بدون تربة إذا كان لديهم ماء وشمس

2. Plants can grow without soil for a while, but finally they need soil.

2. يمكن للنباتات أن تنمو بدون تربة لفترة من الوقت ، لكنها تحتاج في النهاية إلى التربة.

G.R. soil not as a basic plant need?

Because some plants don't need soil to grow water air

Activity (5) Sun light -A basic need

Plants make their own food through the photo Photosynthesis process-

تصنع النباتات طعامها من خلال عملية التمثيل الضوئي

Photosynthesis process عملية التمثيل الضوئي

it is the process through which green plants (leaves)absorb sun light to make own food

إنها العملية التي تمتص من خلالها النباتات الخضراء (الأوراق) ضوء الشمس لصنع طعامها

Green plants use their leaves to collect sunlight and carbon dioxide.- . from air- تستخدم النباتات الخضراء أوراقها لتجميع ضوء الشمس وثاني أكسيد الكربون من الهواء

2. Plant roots absorb water from the soil. جذور النباتات تمتص الماء من التربة .

3. Inside the green plants, sunlight allows carbon dioxide to combine with water to produce: داخل النباتات الخضراء ، يسمح ضوء الشمس بدمج ثاني أكسيد الكربون مع الماء لإنتاج

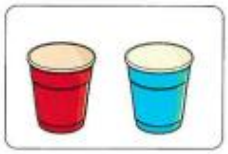
Oxygen which is released in the air to help living organisms breathe

الأكسجين الذي يتم إطلاقه في الهواء لمساعدة الكائنات الحية على التنفس.

Sugar (the food of plant) which gives the plant the energy it needs to grow.

السكر (غذاء النبات) الذي يمنح النبات الطاقة التي يحتاجها للنمو.

Tools


Two plastic cups


Two bean seeds


Soil


Water

Steps 1-Add soil to the two cups, place the bean seeds on the soil, one per cup and cover the seeds with about 2 centimeters of soil

1- نضيف التربة إلى الكوبين ونضع بذور الفول على التربة بواقع كوب واحد في الكوب ونغطي البذور بحوالي 2 سم من التربة.

2. Add the same amount of water to each cup to moisten the soil

أضف نفس الكمية من الماء لكل كوب لترطيب التربة

3. Place the red cup where it will receive light and place the blue cup in the dark

ضع الكوب الأحمر حيث سوف يتلقى الضوء وضع الكوب الأزرق في الظلام

4. Water both plants regularly and observe them along two weeks

اسقي كلا النباتين بانتظام وراقبهما لمدة أسبوعين

Observations After two weeks, we observe that **The plant in the red cup (in light)** grew **taller** than the plant in the blue cup has **four leaves** with **dark green** color, **the plant in the blue cup (in dark)** has **two small leaves** with **pale green** color

ملاحظات بعد أسبوعين ، نلاحظ ما يلي - :نبت النبتة في الكأس الحمراء أطول من النبات في الكأس الزرقاء .يحتوي النبات الموجود في الكوب الأحمر على أربع أوراق ذات لون أخضر غامق ، بينما يحتوي النبات الموجود في الكوب الأزرق على ورقتين صغيرتين بلون أخضر باهت

Conclusions الاستنتاجات

Light is a **basic need** for the plants, like water, air and nutrients -

يعتبر الضوء حاجة أساسية للنباتات مثل الماء والهواء والمغذيات

Light is important to plant growth because plants use light to **make food**- **the plant without light** does not grow well because it had less food

الضوء مهم لنمو النبات لأن النباتات تستخدم الضوء لجعل النبات بدون ضوء لا ينمو بشكل جيد لأنه يحتوي على كمية أقل من الطعام

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
germinate	إنبات	measure	يقييس
seeds	بذور	wet	مبللة
paper towel	منشفة ورقية	covers	غطي
growth	نمو	Inside	داخل
plastic plate	طبق بلاستيك	allows	تسمح
combine	يتحد	Breathe	يتنفس
gives	يعطي	plastic plate	طبق بلاستيك
release	يطلق (ينتج)	taller	اطول
Moisten	مبلل	dark green	أخضر غامق
important	مهم	pale green	أخضر باهت

Exercises on Lesson (2)

1-Choose the correct answer?

1. When the plant seed begins to grow and makes sprouts this process is called

a. respiration. b. germination. c. absorption d. reproduction.

2.If we put some bean seeds in a …… facing the sunlight, it may germinate

a. dry paper towel b. wet paper towel
c. plastic plate d. metric ruler

3.In the presence of Sun and water, the seeds can germinate at the beginning of growth without the need of

a. soil b. rocks c. insects d. dry paper towel

4.Sunlight and carbon dioxide gas are collected by plant's ……to make its own food

a. roots b. stems c. leaves d. flowers

5. The plant produces ……through photosynthesis process that gives it the needed energy to grow

a. oxygen gas b. water c. carbon dioxide gas d. sugar

6. Without…… the plants can't grow well

a. insects b. rocks c. sunlight d. moonlight

7. The roots of a plant absorb…….. from the soil to help it grow

a. oxygen gas b. carbon dioxide gas c. sugar d. water

2. Put (√) or (X)

1. At the beginning of germinating some bean seeds, they can grow without soil or sunlight ( )
2. All seeds need soil in its initial growth ( )
3. After many days, the growth of plant's seeds in a pot containing soil is similar to the growth of plant's seeds in a wet paper towel ( )
4. Green plants can grow in a dark room . ( )
5. Leaves of plants collect sunlight and carbon dioxide gas from air ( )
6. When the plant makes photosynthesis process, its leaves become weak and yellow ( )
7. Water and carbon dioxide are absorbed by plant's roots to help the plant to grow. ( )

3. Correct the underlined words

1. **Respiration** process helps the plant to make its own food(……..)
2. **Oxygen** gas is absorbed by plant's leaves to make photosynthesis process (……..)
3. When a plant is placed in sunlight, its leaves become **pale green** (……..)
4. Plant's **leaves** absorb water and nutrients from the soil (……..)

4-Write the scientific term of each of the following

1-The process by which plants make their own food by using the energy of sunlight (……..)

2-Parts of the plant where sunlight allows carbon dioxide to combine with water during photosynthesis process (……..)

3- A gas produced during photosynthesis process and it is needed for respiration of living organisms. (……..)

4-A substance that is produced from the plant during photosynthesis process and provides it with its needed energy (……..)

5.Complete the following sentences

1.In photosynthesis process, green plant gets .....from air to make its own food and produces..... that helps us to breathe

2.Inside the green plant, sunlight allows carbon dioxide to combine with that is absorbed from the soil by plant's

3.The sugar that is produced from photosynthesis process provides the plant with ..... it needs to grow

4.The presence of and air is very important for plants to grow

6. Give reasons for

1. Green plants can make their own food

……

7. What happens if

1. We put a seed of bean in a soil .

……

2. We put a bean seed in a wet paper towel for more than two months. .

……

2.A plant is placed in a dark place for many days.

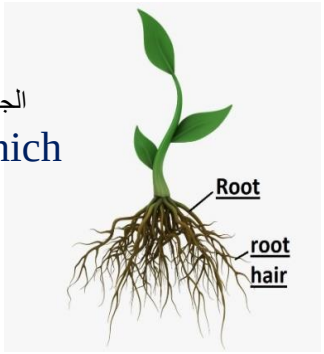
……

Lesson (3) Parts of plant

Roots

Functions of the plant roots وظائف جذور النبات

1. Roots fix (anchor) the plant in the soil الجذور تثبت (ترسيخ) النبات في التربة
2. Roots absorb (draw) water and nutrients from the soil, which are needed to make food of plants
2. 1. تمتص الجذور (تسحب) الماء والمغذيات من التربة اللازمة لصنع غذاء النباتات



Plant roots have hair-like features called **rood hairs** that increase the amount of absorbed water and nutrients that the plant needs

تحتوي جذور النباتات على سمات تشبه الشعر تسمى شعيرات جذرية التي تزيد من كمية الماء الممتص والمواد المغذية التي يحتاجها النبات

Stems الساق

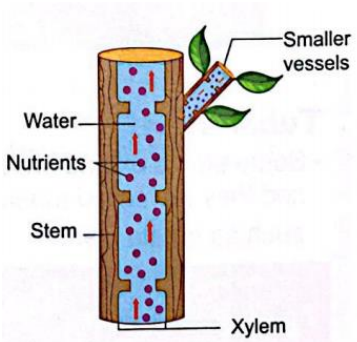
Functions of the plant stem وظائف ساق النبات

1-Stem transports water and nutrients to the rest of the plant through the xylem

ينقل الساق الماء والمغذيات إلى باقي النبات خلال الخشب

2-Stem supports leaves and Flowers of the plant

-ويدعم الجذع الخشبي أوراق وعوارض النبات



There are many forms of stems

Types of Stems أنواع السيقان

Runner ساق جارية
Run along the ground and help to form new plants
Sugar cane
تمتد على الأرض وتساعد في تكوين نباتات جديدة

Tubers
(Extend underground)
Potato plant
(تمديد تحت الأرض) نبات البطاطس

Climb Stem ساق متسلقة
Grape (vines)
العنب

Upright stem ساق رأسية
Most **flowers**
معظم سيقان الزهور

Wood stem اق خشبية
As trunk and **shrubs**
جذع الشجرة والشجيرات

Runner stem :
- Some stems run along the ground to help form new plants and they are called runners.

Tuber stem :
- Some stems extend underground and they are called tubers, such as potato plant.

Climb stem :
- Some plants have climb stems, such as vines (grapes).

Upright stem :
- Most flowers have upright stems.

Wood stem :
- Some plants have wood stems, such as tree trunks and shrubs.

Leaves الأوراق

Leaves contain chlorophyll, which gives them their green color.

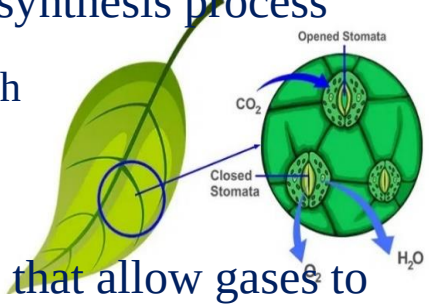
Chlorophyll absorb energy from the sunlight

تحتوي الأوراق على الكلوروفيل الذي يعطيها لونها الأخضر .يلتقط الكلوروفيل الطاقة من ضوء الشمس

Functions of the plant Leaves وظائف الأوراق النبات

Leaves make food for the plant through photosynthesis process

الأوراق تصنع الغذاء للنبات من خلال عملية التمثيل الضوئي



The air that plant needs move into the leaves through tiny openings called stomata

ينتقل الهواء الذي يحتاجه النبات إلى الأوراق من خلال فتحات صغيرة تسمى الثغور

Stomata الثغور

They are pores on the surface of plant's leaves that allow gases to move into and out of the plant.

وهي عبارة عن مسام على سطح أوراق النبات تسمح للغازات بالانتقال إلى داخل النبات وخارجه.

Types of leaves أنواع الاوراق

1- Some are narrow (like needles (such as pine tree)

1-بعضها ضيق يشبه الإبر (مثل شجر الصنوبر).

2- Flat and wider leaves

2-الأوراق مسطحة وواسعة

Photosynthesis process

• Photosynthesis is a process that takes place inside the leaves.

• التمثيل الضوئي هو عملية تحدث داخل الأوراق .

• Chlorophyll absorbs energy from sunlight

• الكلوروفيل يمتص الطاقة من ضوء الشمس

Green leaves use the light energy from the Sun to combine the carbon dioxide from the air with water

تستخدم الأوراق الخضراء الطاقة الضوئية من الشمس لدمج ثاني أكسيد الكربون من الهواء مع الماء

Leaves manufacture (produce) :(تصنيع الأوراق (إنتاج

1-Nutrients (such as sugars, starches, fats and proteins) that the plant - needs to survive

-المغذيات (مثل السكريات والنشويات والدهون والبروتينات) يحتاج النبات للبقاء على قيد الحياة.

2-Oxygen gas that animals and people need to breathe

- غاز الأكسجين الذي تحتاجه الحيوانات والبشر للتنفس

As the photosynthesis process is completed inside the leaves, there are tubes called phloem that transport the food materials from the leaves to the other parts of the plant

مع اكتمال عملية التمثيل الضوئي داخل الأوراق ، هناك أنابيب تسمى اللحاء تنقل المواد الغذائية من الأوراق إلى الأخرى أجزاء من النبات.

Give reason The life on Earth without plants would be impossible

..اذكر السبب ستكون الحياة على الأرض بدون نباتات مستحيلة.-

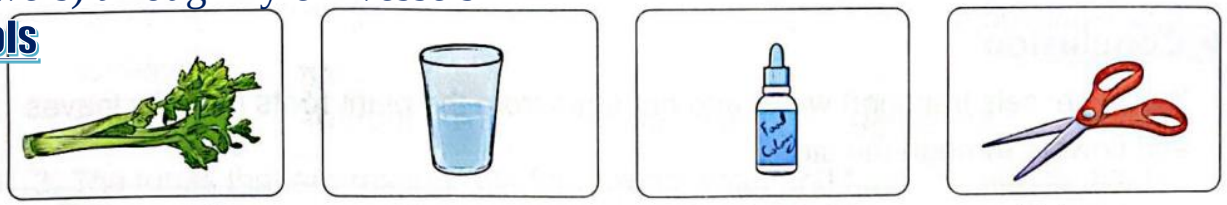
Because during photosynthesis process plants produce oxygen gas that animals and people need to breathe.

لأنه أثناء عملية التمثيل الضوئي ، تنتج النباتات غاز الأكسجين الذي تحتاجه الحيوانات والبشر للتنفس

Activity Up the Stem

In this activity; we will observe how the stem transports water and nutrients from the roots to all the plant parts (leaves and flowers) through xylem vessels

Tools



Celery stalk | Glass cup containing water | Food coloring | Scissors

Steps

1.Fill the cup with water, then add some drops of food coloring to the water

املأ الكوب بالماء ثم أضف بعض الوان الطعام

2.Use the scissors to cut about 2 cm off the bottom of the stalk and place it in the cup of water

2.استخدم المقص لقطع حوالي 2 سم من قاع الساق وضعه في كوب الماء

3.Leave the stalk in the water cup until the next day

اترك القصبة في كوب الماء حتى اليوم التالي

4.Cut across the celery stalk, about 5 cm up from the bottom and observe the xylem vessels inside the stalk

.قطع عبر ساق الكرفس ، على بعد حوالي 5 سم من الأسفل ولاحظ الأوعية الخشبية داخل الساق

Observations

The color of xylem will be turned into the same color of the water in the cup

Also, the color of leaves of celery will be turned into the same color of the water in the cup

سيتحول لون نسيج الخشب إلى نفس لون الماء الموجود في الكوب. كما سيتحول لون أوراق الكرفس إلى نفس لون الماء في الكوب.

Conclusion

Xylem vessels transport water and nutrients from the plant roots up to its leaves and flowers through the stem

تنقل أوعية النسيج الخشبي الماء والمغذيات من جذور النبات حتى أوراقها وأزهارها عبر الساق

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
fix	يثبت	rood hairs	شعيرات جذرية
absorb	يمتص	supports	يدعم
xylem	خشب	Extend	يمتد
Upright	رأسية	trunk	جذع
shrubs	شجيرات	Stomata	الثغور
Flat and wider	مسطحة وواسعة	proteins	بروتين
produce	يكون	starches	نشا
fats	دهون	phloem	اللحاء
impossible	مستحيلة	scissors	المقص

Exercises on Lesson (3)

1-Choose the correct answer?

1.The plant's ……..anchor(Fix) it in the soil

a. leaves b. stems c. roots d. flowers

2. There are…….. in the plant's roots that help the plant to get more water and nutrients

a vessels b. root hairs c. stomata d. flowers

3. The tubes that are responsible for moving water and nutrients up the plant's stem are called

a. roots b. xylem c. leaves d. flowers

4. ……..plant has climb stem

a. Potato b. Tomato c. Vine d. Pine

5. The kind of stems that extend underground are called

a. climb stems b. tubers c. runners d. wood stems

6.Potato plant has …….stem

a. upright b. climb c. tuber d. runner

7. Stomata are present on plant's…… to allow air to pass through them

a. roots d. runner c. Leaves d. flowers

8……..can make their own food

a. Plants only b. Animals only c. Humans only d. Plants and some animals

9……tree has narrow leaves

a. Potato b. Pine c. Acacia d. Grapes

10.The green plants can make their own food through……

a. roots d. runner c. tuber d. flowers

11……help the plant's leaves to get water and nutrients from the soil

a. Roots only c. Roots and xylem b. Xylem only d. Xylem and stomata

12.All the following parts are important for plants to make photosynthesis process except……

a. roots b. leaves c. stems d. flowers

13.The green color of plant's leaves is due to the presence of…… .

a. xylem b. phloem c. chlorophyll d. stomata

14. Food materials are transported from the leaves to other parts of the plant through

a. xylem. b. phloem. c. chlorophyll d. stomata

15. Animals and humans need…… to breathe

a. oxygen gas b. carbon dioxide gas c. water vapor d. sugar

16.Green plants produce all the following substances during photosynthesis process, except..

a. oxygen gas b. carbon dioxide gas c. starches d. fats

2- Choose from column (B) what suits it in column (A)

(A)	(B)
1. Pine trees	a. have climb stems
2. Potato plants	.b. have runner stems
.3. Vines	c. have tuber stems
4. Tree trunks and shrubs	d. have wood stems
	.e. have needles leaves

1. …… 2. …… 3. …… 4. ……

(A)	(B)

1. Roots	a. allows gases to come in and out the plant.
2. Stems	b. collects sunlight and carbon dioxide gas which combines with water to help the plant to make its own food
3. Leaves	c. tubes or vessels that move water and nutrients up the plant's stem
4. Xylem	d. absorbs water and nutrients from the soil
5.Stomata	e. transport nutrients and water from the roots to all parts of the plant
	f. absorbs oxygen gas from the soil

1. ……. 2. ……. 3. ……. 4. …….5……..

3.Put (√) or (x)

1. The plant is fixed in the soil by the help of its roots. ( )
2. Plant's stem has hairs that absorb oxygen gas from the air ( )
3. Xylem helps the plant to get water from the soil ( )
4. Xylem is important for plants to transfer water from plant's roots to leaves ( )
5. A tree trunk is a type of stems called runners.
6. Potato plants have stems called tubers ( )
7. Vines have a kind of stems called climb stems ( )
8. The leaves of pine trees are flat and wide ( )
9. Phloem transports food materials downward from the leaves to other parts of the plant ( )
10. Photosynthesis process produces carbon dioxide gas that help animals and humans to breathe ( )
11. During photosynthesis process, the plant makes sugars, starches, proteins and fats that help it to survive ( )
12. There are tiny holes opening on the surface of stem that allow gases to pass into the plant ( )
13. Water and nutrients reach the plant's leaves with the help of roots only ( )
14. Plants and humans need water and air to live ( )
15. Plants need sunlight, oxygen gas and water to make its own food ( )
16. During photosynthesis process, the plant makes sugars, starches, proteins and fats that help it to survive ( )
17. Chlorophyll helps the plant leaves to absorb sunlight to make photosynthesis process ( )
18. Plants and humans are similar in the way of getting food ( )

4.Correct the underlined words

1. The plant can absorb more water and nutrients from the soil by the help of **xylem** that are found in the roots (……..)
2. There are **smaller** vessels that connect the root to the leaves (……..)
3. Potato plant's stems called **runners** that extend underground(……..)
4. The stems that extend above and along the ground are called **tubers**(……..) 5. Most flowers have **wood** stems (……..)
6. Stomata allow **water** to move into and out of the plant (……..)
7. Chlorophyll in plant's **roots** absorbs energy from the sunlight(……..)

8. Animals and people can't live without **carbon dioxide** gas to breathe(……..)
9. **Xylem** tubes inside the leaves transport food materials downward from the leaves to other parts of the plant(……..)

5.Write the scientific term of each of the following

1.A part of the plant that fix it in the soil (……..)
2. Small structures in the plant's roots that increase the absorption of water and nutrients from the soil (……..)
3. A part of the plant that supports its leaves and flowers . (……..)
4. Vessels in plant through which water and nutrients move up from roots to leaves (……..)
5.The kind of plant's stem in vines (……..)
6. The stems that run along the ground (……..)
7. A plant that has a tuber stem(……..)
8. Narrow holes spread on the surface of plant's leaves that allow gases to move into and out of the plant (……..)
9. It is found in plant's leaves that gives them green color and absorbs energy from the sunlight (……..)
11.The gas that the plant needs to make photosynthesis process(……..)

6. Give reasons for

1. The presence of hair like structure in plant's roots

……

2. Xylem vessels are important for the plant

……

3. The presence of stomata on the surface of plant's leaves. .

……

4.Chlorophyll in plant's leaves has an important role in photosynthesis process

……

.5. 5. There is no life on Earth in the absence of plants

……

7.What happens if

1. The plant doesn't have roots .

.……

2.Stomata of a plant get closed for a long time

.……

3.Plant's leaves don't contain chlorophyll

.……

3. The plant stop making photosynthesis process for several days.

.……

Lesson (4) comparing plant and human system

Need for energy

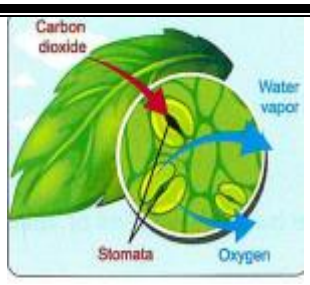
Both **plants** and **humans** need **energy** and **gases** from the air to **survive** and **grow**

Get the energy needed

Plants	Humans
- They can make their own food (sugar) to get energy through photosynthesis process. يمكن للنباتات تصنيع طاقتها على شكل جلوكوز من خلال عملية التمثيل الضوئي	- They must eat food throughout the day to get energy, where: - يجب أن يأكلوا الطعام طوال اليوم للحصول على الطاقة ، حيث: .The digestive system digests food into glucose and nutrients. الجهاز الهضمي يهضم الطعام إلى الجلوكوز والمواد المغذية. , these nutrients are absorbed into the blood ، يتم امتصاص هذه العناصر الغذائية في الدم

Get the gases needed

Plants	Humans
Air enters the plants through stomata in the leaves يدخل الهواء إلى النباتات من خلال الثغور الموجودة في الأوراق	- Air enters the human body through the nose and mouth then to lungs, where oxygen is absorbed and transfer to the blood. - يدخل الهواء إلى جسم الإنسان عن طريق الأنف والفم ثم إلى الرئتين ، حيث يُمتص الأكسجين وينتقل إلى الدم.



Human circulatory system جهاز الدورة الدموية البشرية

- The human circulatory system consists of the heart and blood vessels (tubes).

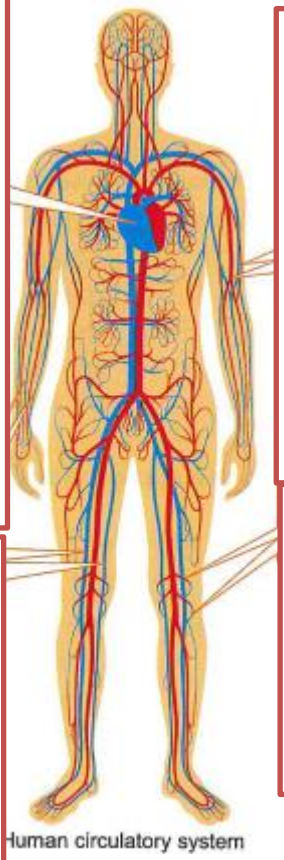
يتكون الجهاز الدوري للإنسان من القلب والأوعية الدموية (الأنابيب)

- The blood vessels in the human arteries or veins

القلب Heart

-It consists of four(4) chambers which are two atria and two ventricles.
- It pumps the blood to all the body parts.
It receives the blood again from all the body parts

ويتكون من أربع غرف هي الأذينين والبطينين.
- يضخ الدم إلى جميع أجزاء الجسم. يستقبل الدم مرة أخرى من جميع أعضاء الجسم.


Human circulatory system

الشرايين Arteries

They carry blood rich in oxygen and nutrients (glucose) from the heart to all the body cells, so the body can survive

تنقل الدم الغني بالأكسجين والمواد المغذية (الجلوكوز) من القلب إلى جميع خلايا الجسم ، حتى يتمكن الجسم من البقاء على قيد الحياة.

الأوردة Veins

They return the blood that carries carbon dioxide and a very small amount of nutrients and oxygen back to the heart, then to the lungs where the blood carries oxygen again

تعيد الدم الذي يحمل ثاني أكسيد الكربون وكمية صغيرة جدًا من العناصر الغذائية والأكسجين إلى القلب ، ثم إلى الرئتين حيث يحمل الدم الأكسجين مرة

Blood capillaries

الشعيرات الدموية

They are tiny blood vessels that connect arteries to veins

إنها أوعية دموية صغيرة تربط الشرايين بالأوردة

Blood *is the* fluid that moves in only one direction *in the human's arteries or veins*

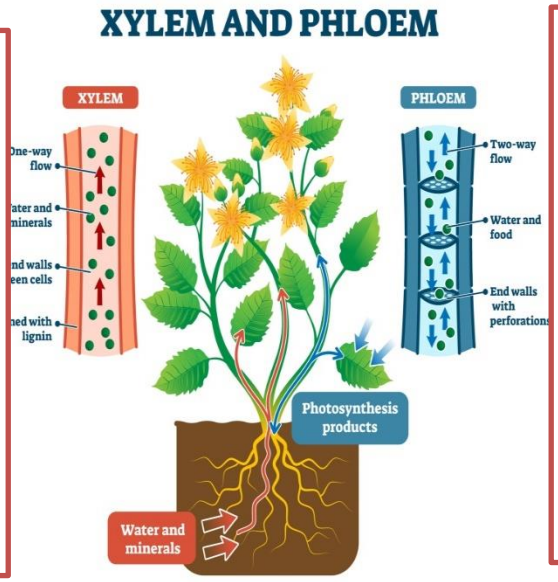
الدم هو السائل الذي يتحرك في اتجاه واحد فقط في شرايين أو

Plant transport system (Plant vascular system)

نظام نقل النبات (نظام الأوعية الدموية للنبات)

It is a system of vessels (tubes) that transports water, nutrients and plant food (glucose) between the plant parts

إنه نظام من الأوعية (الأنابيب) التي تنقل المياه والمغذيات والأغذية النباتية (الجلوكوز) بين أجزاء النبات.



الخشب Xylem

It consists of tubes that transport water and nutrients upward from the roots to the leaves to make the plant food (glucose sugar)

يتكون من أنابيب تنقل الماء والعناصر المغذية لأعلى من الجذور إلى الأوراق لصنع غذاء النبات (سكر الجلوكوز)

اللحاء Phloem

It consists of tubes that transport the produced glucose sugar from the leaves to all other parts of the plant to grow

ويتكون من أنابيب تنقل سكر الجلوكوز المنتج من الأوراق إلى جميع أجزاء النبات الأخرى لينمو

The transport system in plants has one-way vessels that move important substances between the parts of the plant

يحتوي نظام النقل في النباتات على أوعية أحادية الاتجاه تنقل المواد المهمة بين أجزاء النبات

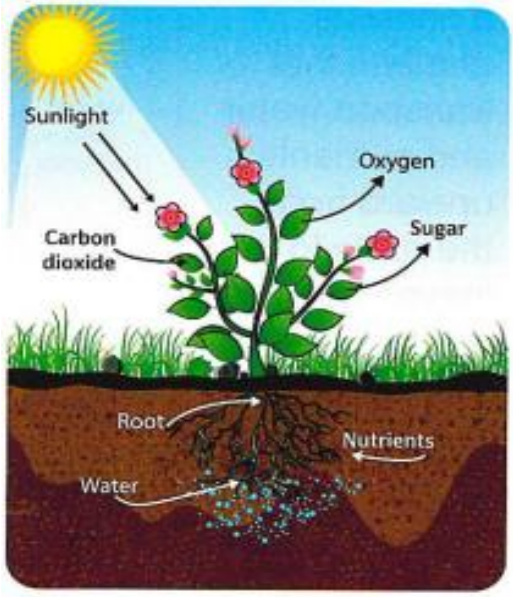
Activity 9 Plant food اغذية النبات

Plants depend on carbon dioxide released by animals to make their own food during photosynthesis process.

تعتمد النباتات على ثاني أكسيد الكربون الذي تطلقه الحيوانات لصنع غذائها أثناء عملية البناء الضوئي.

Also, animals depend on oxygen released by plants to breathe.

كما تعتمد الحيوانات على الأكسجين الذي تطلقه النباتات للتنفس.



Photosynthesis process

We can explain the steps of photosynthesis process in plants to make their food in the following diagram:

Plants have chlorophyll in the leaves that absorbs light energy from the Sun.

تحتوي النباتات على الكلوروفيل في الأوراق التي تمتص طاقة الضوء من الشمس

Plants have stomata in the leaves to allow carbon dioxide enters the plant

تحتوي النباتات على ثغور فى الأوراق للسماح لثانى اكسيد الكربون بدخول النبات

Plants have xylem vessels that transport water and nutrients from the root and move them to other parts of the plant.

تحتوى النباتات على ثغور فى الأوراق للسماح لثانى اكسيد الكربون بدخول النبات

in plant's leaves, sunlight helps water combine with carbon dioxide to make glucose sugar which is used by plant cells for food.

في أوراق النبات، يساعد ضوء الشمس الماء على الاتحاد بثاني أكسيد الكربون لصنع سكر الجلوكوز الذي تستخدمه خلايا النبات كغذاء.

Phloem moves glucose from the leaves to the other parts of the plant as a source of energy to live and grow

ينقل اللحاء الجلوكوز من الأوراق إلى الأجزاء الأخرى من النبات كمصدر للطاقة للعيش والنمو

During photosynthesis process, the plant also produces oxygen and water vapor which are released into the air.

أثناء عملية البناء الضوئي، ينتج النبات أيضًا الأكسجين وبخار الماء اللذين يتم إطلاقهما في الهواء.

• During photosynthesis process, light energy of the Sun is transformed into chemical energy that is found in glucose.

أثناء عملية التمثيل الضوئي ، تتحول الطاقة الضوئية للشمس إلى طاقة كيميائية توجد في الجلوكوز..

Other living organisms, such as animals and humans, depend on the oxygen that plants release during photosynthesis process for their respiration.

تعتمد الكائنات الحية الأخرى ، مثل الحيوانات والبشر ، على الأكسجين الذي تطلقه النباتات أثناء عملية التمثيل الضوئي من أجل تنفسها

P.O.C	Plant Transport	Transport System
Similarities	They transport nutrients and gases to all body parts . They transport nutrients and gases in one direction نقل العناصر الغذائية والغازات اللازمة للنبات - ينقلان العناصر الغذائية والغازات في اتجاه واحد	
Differences	It consists of 1-Xylem 2- Phloem	It consists of 1- Arteries 2- Veins
	Xylem transported Water and nutrients to the leaves to make the plant food Phloem carries the glucose sugar downward into all other parts of it to grow	Arteries carry blood that is rich with oxygen and nutrients (glucose) from the heart to the body cells Veins return the blood that carries carbon dioxide and is low in nutrients and oxygen back to the heart

Activity 10 Flowers and Seeds الزهور والبذور

•Some plants have large colorful flowers.

بعض النباتات لها أزهار ملونة كبيرة.

•Some other plants, such as grasses, have very small flowers and some flowers are not very colorful

بعض النباتات الأخرى ، مثل الأعشاب ، لها أزهار صغيرة جدًا وبعض الزهور ليست ملونة جدً

• Flowers are the reproductive parts of many plants.

الزهور هي الأجزاء التناسلية للعديد من النباتات

Plant reproduction: تكاثر النبات

It is the process of making new plants. عملية انتاج نباتات جديدة

Function of the plant's flowers: وظيفة زهور النبات

Flowers produce seeds for the plant that help the plant to reproduce. When seeds receive air, water and the suitable temperature, they can grow into a new plant.

تنتج الأزهار بذورًا للنبات تساعد النبات على التكاثر .عندما تتلقى البذور الهواء والماء ودرجة الحرارة المناسبة ، يمكن أن تنمو لتصبح نباتًا جديدًا.

In the sunflower, the seeds are the small dark-colored objects in the center of this flower.

في عباد الشمس ، البذور هي الأجسام الصغيرة ذات اللون الداكن في وسط هذه الزهرة

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
stomata	الثغور	circulatory system	الدورة الدموية
mouth	الفم	heart	القلب
lungs	الرئتين	blood vessels	الأوعية الدموية
arteries	الشرايين	Blood capillaries	الشعيرات الدموية
veins	الاوردة	fluid	سائل
Blood	الدم	Xylem	الخشب
chambers	غرف	Phloem	اللحاء
upward	لأعلى	transport	ينقل
chlorophyll	الكلوروفيل	combine	يتحد
receive	يستقبل	sunflower	عباد الشمس

Exercises on Lesson (4)

1-Choose the correct answer?

1.The human system that moves blood through the body is called……. system.
a. digestive b. respiratory c. circulatory d. nervous

2.Air enters the human body through the
a. nose only b. mouth only c. nose and mouth d. mouth and stomach

3.The human circulatory system consists of……
a. lungs and heart. b. heart and blood vessels
c. blood vessels and stomach. d. heart and pancreas

4……carry blood which is rich in oxygen and glucose from the heart to the body cells
a. Arteries b. Veins c. Lungs and veins d. Brain and veins

5.Blood rich in carbon dioxide gas returns back to the heart through
a. arteries b. veins. c. lungs d. xylem

6.system in plants consists of tubes that water and nutrients move through it.
a. Digestive b. Respiratory c. Transport d. Nervous

7.The heart in the human circulatory system consists of
a. two arteries and two ventricles. b. two atria and two ventricles
c. two veins and two atria d. two ventricles and two veins

8.Glucose sugar is transported from the leaves to other parts of the plant through
a. xylem. b. phloem c. roots d. stems

9……in the leaves allow air to enter the plant
a. Xylem b. Phloem c. Stomata d. Chlorophyll

10-In plant's leaves, light energy is converted into…… energy during photosynthesis process
a. sound b. electric c. chemical d. kinetic

11. Plants can produce new seeds by……..
a. roots b. leaves c. stems d. flowers

12. The reproductive parts of many plants are called……..
a. veins b. roots c. leaves d. flowers

13. In ……its seeds are small dark-colored objects in the center of this flower
a. pine tree b. sunflower c. potato plant d. celery

2.Put (√) or (x)

1. Air enters plants through their roots ( )
2. Living organisms need energy and gases from the air to survive and grow ( )
3. Human circulatory system consists of the heart and the lings ( )
4. Arteries are vessels in human circulatory system that carry blood rich in carbon dioxide gas ( )
5. The heart in the human circulatory system consists of two chambers ( )
6. Oxygen and glucose are transported from the heart to the body cells through arteries ( )
7. Phloem transports water and nutrients from the roots to the leaves ( )

8. Glucose is a type of sugar that is produced from plants during photosynthesis process ( )
9. The reproductive parts of many plants are flowers ( )
10- Plant's seeds are formed inside the flowers ( )

3.Correct the underlined words

1.Human circulatory system consists of the **lungs** and blood vessels(…….)
2.**Brain** pumps blood to all the body parts(…….)
3.Each of xylem in plants and veins in human are **two-ways** vessels (……..……)
4.**Veins** carry blood rich in oxygen and nutrients. (……..……)
5. During photosynthesis process, light energy is transformed into **sound** energy (…….)
6.Plants make glucose during **respiration** process that provides them with energy . (…….)
7.Flowers of plants produce **root hairs** that help the plant to reproduce (……..)

4.White the scientific term of each of the following

1. Smaller vessels that transport water and nutrients from the plant roots up through the stem to its leaves and flowers (……..)
2. The human body system that is responsible for transportation of blood and other fluids throughout the body (…….)
3.It pumps the blood to all the body parts and receives it again. (…….)
4.Tiny blood vessels that connect arteries to veins(…….)
5.A system of tubes through which water, nutrients and plant food are carried all over the plant (…….)
6.Blood vessels carry blood from the heart to all the body parts (…….)
7.Blood vessels carry blood from the body parts and return it back to the heart (…….)
8.A type of sugar produced by the plant during photosynthesis process(…….)
9.Vessels move glucose from the leaves to other parts of the plant (…….)
10-Parts of the plant that are responsible for reproduction(…….)
11.The process of producing new plants. (…….)

5. Give reasons for

1. Xylem in plant is a one-way vessel

……

2. Flowers are important parts for the plant .

……

6.What happens if…..?

1.Plants can't produce glucose sugar during photosynthesis process.

……

2.We remove the flowers of a plant.

……

Lesson (5) Seed Dispersal

Activity 16 Seed Dispersal

Ways of seed dispersal in nature

2. Floating on water of rivers or lakes
2. Traveling by wind
3. Sticking to animal fur or human clothes
4. Being eaten by animals and comes out with their stool

In this activity, we will investigate how seeds move from one place to another

Look at the following seeds in the pictures below, then decide how you think the seeds in the pictures move from one place to another

Seeds	Figure	The Way of Seed Dispersal طريقة الانتشار
Coconut Seed بذرة جوز الهند		Seeds that are dispersed by water can float on water بذور تنتقل بالماء لانها تطفو على الماء
Maple Seed بذرة القبقب		Seeds that are dispersed by wind are light. Examples: • Maple seeds. * Dandelion seeds. :
Dandelion Seed بدرة الهندياء		
Tomato Seed بذرة الطماطم **Apple seeds** بذرة التفاح		4-Seeds eating by Living organisms that eat the fruit and spread the seeds الكائنات الحية التي تأكل الفاكهة وتنشر البذور
Burr seed (has spine) الأرقطيون		It has spines that help it stick to animal fur and human clothing بها أشواك تساعدها على الالتصاق: فرو الحيوانات وملابس الإنسان

Different ways of seed dispersal depend on the different properties of (such as: size, shape, ...etc).

► **Put (√) or (x):** 1. Light seeds travel in the air. ( )

2. Seeds with spines stick to animal fur. ( )____

Activity 17

Record Evidence like a Scientist Tree Needs »

Now that you have learned about plant needs , look again at the image of Planting a Tree . You first saw this in Wonder . ?

الان تعرفت على احتياجات النبات ، انظر مرة أخرى إلى صورة زرع شجرة .لقد رأيت هذا لأول مرة وتعجبت

Question :

How do plant parts make use of water , air , and light for vital processes ?

كيف تستفيد أجزاء النبات من الماء والهواء والضوء للعمليات الحيوية؟

My Claim :

- A plant depends on its parts to obtain basic needs , such as water , air , and sunlight .
- Each part of the plant has a function to help it survive .

يعتمد النبات على أجزائه في الحصول على الاحتياجات الأساسية مثل الماء والهواء وأشعة الشمس :
كل جزء من أجزاء النبات وظيفة تساعده على البقاء على قيد الحياة له«

Evidence : شهادة

-Plant's roots absorb water and nutrients from the soil .

-Plant's stems transport the water from the roots to the leaves .

-Plant's leaves absorb air and sunlight to produce their own food from glucose .

-Sunlight is one of the basic needs of plants .

..تمتص جذور النبات الماء والمواد المغذية من التربة - ينقل النبات الماء من الجذور إلى الأوراق
-. تمتص أوراق النبات الهواء وضوء الشمس لتنتج طعامها من الجلوكوز - ضوء الشمس من الاحتياجات الأساسية للنباتات

Scientific Explanation with Reasoning الشرح العلمي مع التفكير

- The light energy emitted by sunlight converted into chemical energy.
-If the basic needs of the plant are not met, it will not grow and may die .

-. كما تجد في أوراق النبات ، فإن الطاقة الضوئية المنبعثة من أشعة الشمس تتحول إلى طاقة كيميائية -
إذا لم يتم تلبية الاحتياجات الأساسية للنبات فلن ينمو وقد يموت

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Coconut Seed	بذرة جوز الهند	dispersal	تنتشر
Maple Seed	بذرة القبقب	Floating	تطفو
Dandelion Seed	بدرة الهندياء	Sticking	تلتصق
Tomato- Apple	التفاح - الطماطم	investigate	تحقيق
Burr seed	الأرقطيون	Wonder	عجب
Planting	زرع	vital processes	للعمليات الحيوية
basic	الأساسية	function	الوظيفة
depends	تعتمد على	chemical energy	طاقة كيميائية
emitted	تنبعث	converted	تحولت
sunlight	ضوء الشمس	spines	شويكات

Exercises on Lesson (5)

1-Choose the correct answer?

1. The movement of seeds from a place to another is called

a. seeds germination. b. seeds dispersal c. seeds reproduction d. seeds growth

2. All the following can help in seed dispersal, except

a. wind b. water c. human and animals . d. soil and sunlight

3. Maple seeds travel by wind because they are

a light seeds. b. spiny seeds. c. heavy seeds d. smooth seeds.

4. Burr seeds have spines, so they can

a. float on water. b. travel by wind.

c. stick to animal fur d. be eaten by animals.

5. From the ways of seeds dispersal is floating on water as in

a. burdock seeds. b. tomato seeds. c. dandelion seeds. d. coconut seeds.

2.Choose from columns (B) what suits it in column (A):

(A)	(B)
1. Coconut seeds	a sticking to animal fur
2. Maple seeds and dandelion seeds	b. floating on water
3. Burr seeds	c, being eaten by animals
4. Tomato seeds and apple seeds	d. traveling by wind
	e, staying inside flowers without movement

1……. 2…… 3……. 4…….

3. Put (√) or (x):

1. Seeds germination means the transportation of seeds from one place to another( )
2. There are many ways of seeds dispersal in nature. ( )
3. Coconut seeds can float on water. ( )
4. Dandelion seeds have spines, so they stick to animal fur. ( )
5 Tomato seeds are light so they can disperse through air( ).
5. Human could be one of the ways of seed dispersal. ( )

4.Correct the underlined words:

1. Coconut seeds disperse by **wind**. (……)
2. Burr seeds are **light** seeds. (……)
3. Tomato and **coconut** seeds being eaten by animals and come out with their stool. (……)

5.Give reasons for

1. Seeds dispersal may take place by animal in two different ways

……

2. Seeds of maple or dandelion plants can disperse through wind easily

……

3. Burr seed can stick to animal fur

……

Concept 1.2

Energy flow in ecosystem

Lesson (1) ecosystem

Ecosystem. A natural area (or community) contains living organisms and non - living things that interact with each other

النظام البيئي منطقة طبيعية أو المجتمع تتكون من كائنات حية وكائنات غير حية تتفاعل مع بعضها البعض

The interaction between different components of an ecosystem depends on the flow of energy through these components.

يعتمد التفاعل بين المكونات المختلفة للنظام البيئي على تدفق الطاقة من خلال هذه المكونات.

How does energy flow through an ecosystem? كيف تتدفق الطاقة من خلال نظام بيئي؟

Energy flow (moves) through an ecosystem from plants to animals and between animals when they eat each other

-when living organisms die, their energy is returned to the soil

تتدفق الطاقة (تتحرك) عبر نظام بيئي من النباتات إلى الحيوانات وبين الحيوانات عندما تأكل بعضها البعض ، - عندما تموت الكائنات الحية ، تعود طاقتها إلى التربة.

Hawks in ecosystem الصقور في النظام البيئي

Hawks get energy from food

يحصل الصقور على الطاقة من الطعام

Hawks eat different types of animals such as, snakes, mice, fish, birds, squirrels, rabbits and other small ground animals

تتغذى الصقور على أنواع مختلفة من الحيوانات مثل الثعابين والفئران والأسماك والطيور والسناجب والأرانب وغيرها من الحيوانات الأرضية الصغيرة

Hawks do not eat plants, but they eat animals who eat plants, so they also depend on plants for energy

لا تأكل الصقور النباتات ، لكنها تأكل الحيوانات التي تأكل النباتات ، لذلك فهي تعتمد أيضًا على النباتات للحصول على الطاقة

There are few **predators** that can attack hawks such as eagles or other hawks

هناك عدد قليل من الحيوانات المفترسة التي يمكنها مهاجمة الصقور مثل النسور أو الصقور الأخرى

What happens when the hawk dies? ماذا يحدث عندما يموت الصقر؟ .

When a hawk dies, it decomposes and its energy is returned to the soil

عندما يموت الصقر يتحلل ويعود طاقته إلى التربة

Activity 5 Energy flows in Ecosystems

النشاط 5 تدفقات الطاقة في النظم البيئية

An ecosystem is a community that provides food, water and shelter to all living organisms live in it

النظام البيئي هو مجتمع يوفر الغذاء والماء والمأوى لجميع الكائنات الحية التي تعيش فيه

There are many different ecosystems on the Earth such as ocean, a rainforest a desert or the tundra

هناك العديد من النظم البيئية المختلفة على الأرض مثل المحيطات أو الغابات المطيرة أو الصحراء أو التندرا

• Animals don't choose the food they eat according to its taste, but they eat food according to what these animals bodies need to survive such as

• ..الحيوانات لا تختار الطعام الذي تأكله حسب ذوقها ، لكنها تأكل الطعام حسب ما تحتاجه هذه الحيوانات للبقاء على قيد الحياة مثل

Caracal eats mouse - Rabbit eats grass Bird eats butterflies and worms



Why animals eat plants or other animals

لماذا تأكل الحيوانات النباتات أو الحيوانات الأخرى

Because animals need energy that comes from eating plants and other animals, as they cannot produce their own food

لأن الحيوانات تحتاج إلى طاقة تأتي من أكل النباتات والحيوانات الأخرى ، لأنها لا تستطيع إنتاج طعامها

There is a relationship between sunlight and the energy we get from our food, because the energy we get from food originally comes from the Sun

هناك علاقة بين ضوء الشمس والطاقة التي نحصل عليها من طعامنا ، لأن الطاقة التي نحصل عليها من الطعام تأتي في الأصل من الشمس

►Check your understanding

Complete the following sentences using these words (caracal -) grass - birds

1-Worms can be eaten by……..

2-Rabbit eats……

3-Mouse can be eaten by……..

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Ecosystem	النظام البيئي	living organisms	كائنات حية
natural area	منطقة طبيعية	non living things	وكائنات غير حية
contains	يحتوى علي	interact	تتفاعل مع
community	المجتمع	according	حسب
provides	يوفر	taste	الطعم
butterflies	فراشات	shelter	ماوى
worms	ديدان	ocean	المحيط
rainforest	الغابات المطيرة	tundra	التندرا
desert	الصحراء	hawks	الصقور
predators	الحيوانات المفترسة	eagles	النسور
attack	تهاجم	squirrels	السناجب

Concept 1.2

Exercises on Lesson (1)

1-Choose the correct answer?

1. A community that includes living organisms and nonliving things is known as……

a digestive system b respiratory system
c. ecosystem d. vascular system

2. The interaction that presents in an ecosystem occurs between

a. plants and nonliving things only b. animals and nonliving things only
c. animals and plants only d. living organisms and nonliving things

3. Hawks get their energy from ……..

a. plants only b. animals only c. plants and animals d. nonliving things

4.Rabbit can be eaten by all the following living organisms, except

a. Hawk b. caracal c. grass d. eagle

5. All the following are considered as a source of energy for hawks, except

a snakes. b. birds c. squirrels d. seeds

6. There is an energy flow between all the following two living organisms except.

a. a lion and a deer b. a tomato plant and a potato plant
c. a human and a fish d. a predator and its prey

7. Caracal obtains its energy by eating

a. shark b. grass c. mice d. butterfly

2. Put (√) or (x):

1. There is no interaction between the components of an ecosystem. ( )
2. When living organisms die, all energies that present in their bodies o to the soil. ( )
3.Hawks do not eat some types of food like plant leaves ( )
4.There is no energy flow between living organisms that live in seas and oceans. ( )
5. Birds eat insects as a prey to get their energy. ( )
6.The energy we get from food originally comes from the Sun ( )

3.Write the scientific term of each of the following

1. A community that contains living organisms and nonliving things (……..)
2. A place that provides food, water and shelter to all living organisms that live in it. (……..)

4.Give reasons for

.Animals eats different types of food

…….

5.What happens if...?

.A hawk is placed in an ecosystem that doesn't contain any living organisms.

……

Lesson (2) Food is Energy

Activity 6 Food is Energy

How we get energy كيف نحصل على الطاقة

Food and the oxygen we breath provide us with energy that we need throughout the day

يزودنا الطعام والأكسجين الذي نتنفسه بالطاقة التي نحتاجها طوال اليوم.

We need energy to do all activities in our daily life such as thinking, breathing and moving •

• نحتاج إلى الطاقة للقيام بجميع الأنشطة في حياتنا اليومية مثل التفكير والتنفس والحركة.

There are some activities require a lot of energy such as hard work or doing exercises.

هناك تتطلب بعض الأنشطة الكثير من الطاقة مثل العمل الجاد أو أداء التمارين.

Our bodies still use some energy even when we sleep

لا تزال أجسادنا تستخدم بعض الطاقة حتى عندما ننام .

The primary source of energy المصدر الأساسي للطاقة ..

The Sun is the primary source of energy for all organisms on Earth to live, grow and carry out life processes

الشمس هي المصدر الأساسي للطاقة لجميع الكائنات الحية على الأرض للعيش والنمو وتنفيذ عمليات الحياة

How different living organisms get energy كيف تحصل الكائنات الحية المختلفة على الطاقة

1- produce their own food such as plants

2- get food from other organisms such as animals including humans

1- إنتاج طعامها مثل النباتات 2- الحصول على طعام من كائنات أخرى مثل الحيوانات بما في ذلك البشر

Plants	Animals
Plants can make their own food through photosynthesis process by absorbing the sunlight through their leaves and use the sun's energy to convert water and carbon dioxide gas into glucose يمكن للنباتات أن تصنع طعامها من خلال عملية التمثيل الضوئي عن طريق امتصاص ضوء الشمس من خلال أوراقها واستخدام طاقة الشمس لتحويل الماء وغاز ثاني أكسيد الكربون إلى جلوكوز	Animals and humans cannot make their food, but they get energy from the environment in which they live لا تستطيع الحيوانات بما في ذلك البشر صنع طعامها ، لكنها تحصل على الطاقة من البيئة التي يعيشون فيها Different animals can get their food by -Eating plants only Eating other animals that eat plants Eating both plants and animals

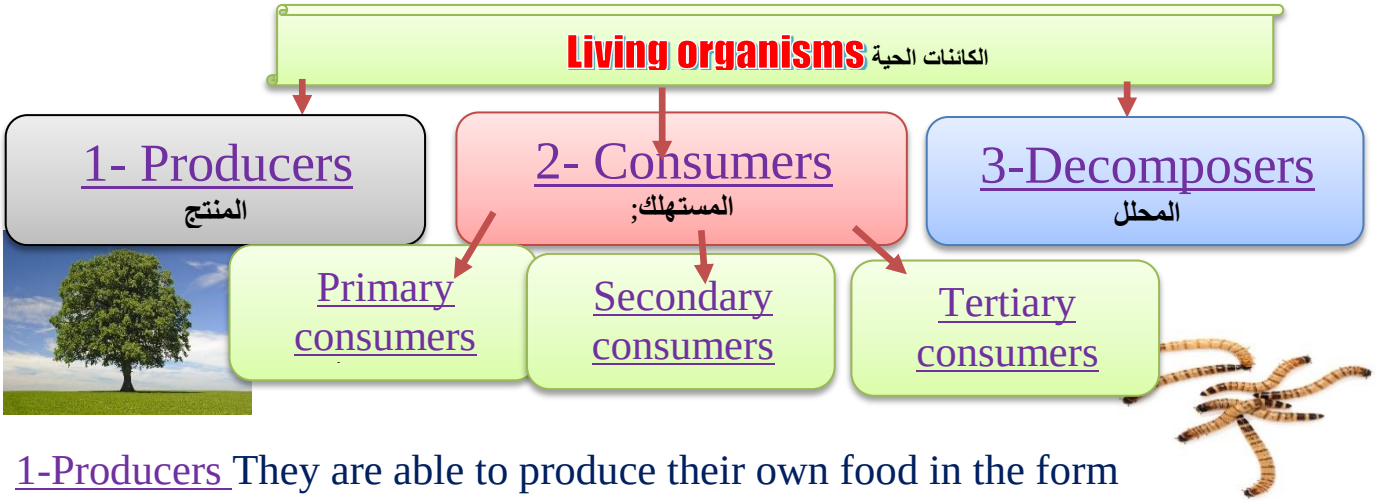
The light energy of the Sun (radiant energy) is converted into chemical energy in plants during photosynthesis and then this energy is passed to animals and humans

يتم تحويل الطاقة الضوئية للشمس (الطاقة المشعة) إلى طاقة كيميائية في النباتات أثناء عملية التمثيل الضوئي ومن ثم تنتقل هذه الطاقة إلى الحيوانات والبشر

Activity 7 Food Chains Energy for life

All living organisms eat food to get the energy they need to survive
Living organisms feed on one another, so energy passes between them

• Living organisms are classified according to their ways of getting food



1-Producers They are able to produce their own food in the form of glucose sugar which is rich with energy
الكائنات المنتجة كائنات قادرة على إنتاج طعامهم على شكل سكر الجلوكوز الغني بالطاقة.

.Producers don't consume (feed on) other plants or animals
الكائنات المنتجة تستهلك (تتغذى) على النباتات أو الحيوانات الأخرى

Example: Plants use energy from the Sun to produce their own food by photosynthesis process النباتات تستخدم الطاقة من الشمس لإنتاج طعامها عن طريق عملية التمثيل الضوئي :

all of the producers on the Earth are plants
جميع المنتجين على الأرض تقريبًا من النباتات

2-Consumers They cannot produce their own food
الكائنات المستهلكة لا يمكنهم إنتاج طعامهم بأنفسهم

Consumers They are organisms that eat other living organisms to get their energy, because they cannot make their own food
الكائنات المستهلكة هم كائنات حية تأكل الكائنات الحية الأخرى للحصول على طاقتها ، لأنهم لا يستطيعون صنع طعامهم

1- Primary consumers المستهلك الأول	2- Secondary consumers المستهلك الثاني	3- Tertiary consumers المستهلك الثالث
They are animals that eat producers (plants) هم الحيوانات التي تأكل المنتجين (النباتات)	They are animals that eat the primary consumers . هم الحيوانات التي تأكل المستهلك الاول	They are animals that eat the secondary consumers. هم الحيوانات التي تأكل المستهلك الثاني meat - eating animals
Examples Insects . mice .and rabbits	Examples Birds and frogs	Examples crocodile. Lions and sharks



Birds are secondary consumers, because they eat insects and other organisms that eat plants

الطيور هي مستهلك ثانوي ، لأنها تأكل الحشرات والكائنات الحية الأخرى التي تأكل النباتات

3- Decomposer: The final link in any food chain

المحلل: الحلقة الاخيرة في أي سلسلة غذائية -3

Decomposer They are living organisms that carry out the decomposition process by decaying dead organisms .

إنها كائنات حية تقوم بعملية التحلل عن طريق تحلل الكائنات الحية الميتة.

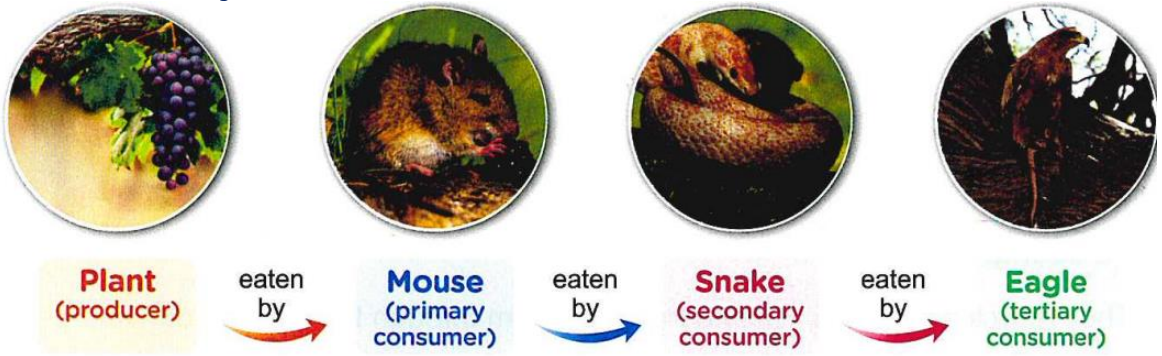
Examples Decomposer لةامثلة الكائنات المحل

Fungi الفطريات	Bacteria البكتريا	worms الديدان	millipedes الديدان الألفية
			

Importance 1-Increasing the soil fertility . - زيادة خصوبة التربة.

2-Recycling nutrients back into the ecosystem . إعادة تدوير المغذيات إلى النظام البيئي.

Food Chain : It is a model that shows the movement of energy in an ecosystem السلسلة الغذائية: هو نموذج يوضح حركة الطاقة فى النظام البيئى .



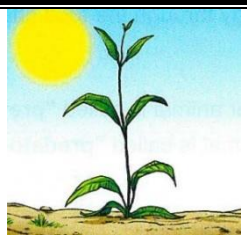
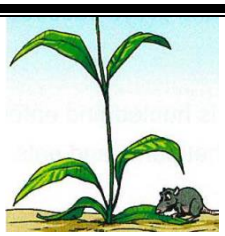
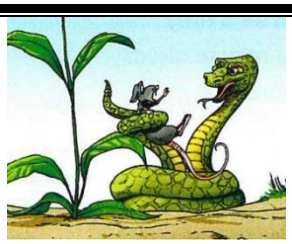
Energy Flow

Food Chain all organisms need energy to do their activities and this energy flows through an ecosystem

السلسلة الغذائية جميع الكائنات الحية تحتاج إلى طاقة للقيام بأنشطتها وأن هذه الطاقة تتدفق عبر نظام بيئي

Example of a food chain.

1- green plant	2- mouse	3-snake	4- hawk
makes its own food using energy from sunlight	eats the green plant to get energy	eats the mouse to get energy	eats the snake to get energy


There are organisms that cannot get energy directly from the Sun, so they obtain their needed energy by eating other living organisms

هناك كائنات لا تستطيع الحصول على الطاقة مباشرة من الشمس ، لذلك تحصل على الطاقة التي تحتاجها عن طريق تناول الكائنات الحية الأخرى

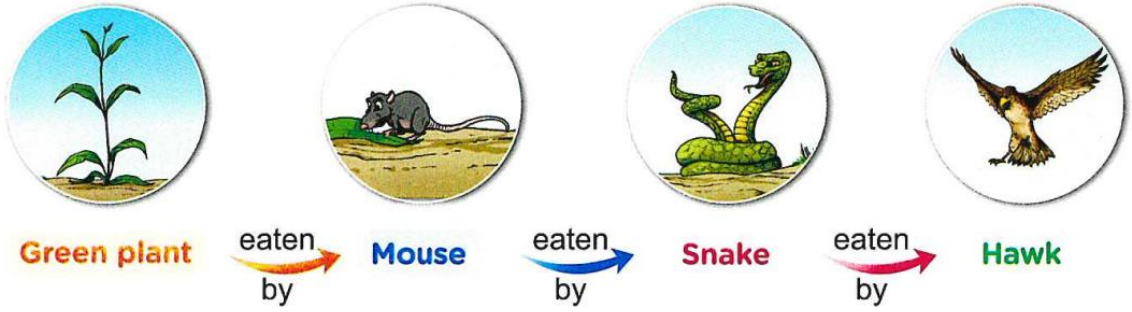
From the previous explanation, we can conclude that:

• The energy from the Sun passes to the green plant, then to the mouse and snake then finally to the hawk

تنتقل الطاقة من الشمس إلى النبات الأخضر ، ثم إلى الفأر والثعبان ثم في النهاية إلى الصقر

•Green plant can make its own food using the sunlight , while animals like mouse, snake and hawk cannot

يمكن للنبات الأخضر أن يصنع طعامه باستخدام ضوء الشمس ، بينما لا تستطيع الحيوانات مثل الفأر والأفعى والصقر.



Predator and prey

The hawk and snake are "Predators", because they hunt other animals

الصقر والثعبان هم "مفترسون" ، لأنهم يصطادون الحيوانات الأخرى

•The snake and the mouse are "Prey", because they are hunted by other animals for food

• الثعبان والفأر "فريسة" ، لأن الحيوانات الأخرى تصطادهم للحصول على الطعام.

"Prey". Any animal that is hunted and eaten by another animal

"الفريسة"أي حيوان يصطاده ويأكله حيوان آخر.

"Predator". Any consumer that hunts and eats another animal

"المفترس" أي مستهلك يصطاد ويأكل حيواناً آخر.

mouse **is a** prey

Because the snake eats it

Hawk **is a** predator

Because it eats the snake

Snake **is a** predator **or** prey **at the same time**

Because it eats the mouse or the hawk eats it

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
thinking	التفكير	Primary	الأول
breathing	التنفس	Secondary	الثاني
moving	الحركة	Tertiary	الثالث
consumers	المستهلك	Producers	المنتج
Decomposers	المحلل	Fungi	الفطريات
soil fertility	خصوبة التربة	Bacteria	البكتريا
prey	فريسة	explanation	الشرح
Predator	مفترس	directly	مباشرة
mouse	فار	hunted	يصطاد
millipedes	الديدان الألفية	Food Chain	سلسلة غذائية

Exercises on Lesson (2)

1-Choose the correct answer?

1. Living organisms that can absorb sunlight to make their own food are

a. animals only b. plants only c. humans and plants d. animals and plants

2-We need more energy during

a. watching TV b. sleeping c. listening to music d. doing exercises

3-Plants can make their own food through process

a. breathing b. photosynthesis c. digestion d. reproduction

4.Leaves of green plants absorb the sunlight to combine water with ……to produce their own food

a. oxygen gas b. soil c. carbon dioxide gas d. roots

5. .The primary source of energy for all living organisms on the Earth is…

a. the Sun b. green plants c. glucose sugar d. photosynthesis process

6.All the following sentences are correct about photosynthesis, except

a. it depends on sunlight
b. it produces glucose sugar and carbon dioxide gas
c. it produces glucose sugar and oxygen gas
d. it occurs in plant leaves

7. According to the way of feeding, living organisms are classified into ……

a. two groups b. three groups c. four groups d. five groups

8. ……need energy to survive. .

a Consumers only b. Decomposers only
c. Consumers and decomposers only d. Producers, consumers and decomposers

9. Photosynthesis process produces…….

a. glucose sugar in consumers. b. glucose sugar in producers
c. water in consumers d. water in decomposers

10. Which of the following living organisms can make their own food

a. Hawks. b. Mice c. Pine trees d. Caracals

11. Nearly all plants are considered as ……..… .

a. consumer organisms. b. nonliving things
c. decomposer organisms. d. producer organisms

12. To obtain energy to survive

a, a producer eats a decomposer b. a consumer eats a producer
c. a butterfly eats a hawk d. a hawk eats a butterfly

13. Living organisms that cannot make their own food are ……..…

a. animals and plants b. decomposers and producers
c. consumers and decomposers d. consumers and producers

14.Many insects are considered as ……..…

a. producers b. decomposers c. primary consumers d. secondary consumers

15.The energy can flow directly ……..

a. from a plant to an eagle b. from an ant to an eagle
c. from a snake to an eagle. d. from an eagle to a snake

16.Which of the following food chains shows the correct way of energy flow through consumers

a. Secondary consumer → primary consumer → tertiary consumer
b. Primary consumer → secondary consumer → tertiary consumer
c. Tertiary consumer → secondary consumer → primary consumer
d. Secondary consumer → tertiary consumer → primary consumer

17.All the following organs are consumers, except …….

a. deers b. crocodiles c. rabbits d. millipedes

18.Any food chain starts with……

a. insects b. plants c. fungi d. bacteria

19.Decomposers always…… the soil

a. pollute b. damage c. benefit d. harm

20.Waste materials produced from millipedes and worms are rich in……

a. water b. nutrients c. oxygen gas d. carbon dioxide gas

21. ……..are living organisms that can make their food directly from the light energy of the Sun

a. Worms b. Grasses only c. Trees only d. Grasses and trees

2.Choose from columns (B) what suits it in column (A):

(A)	(B)
1. Photosynthesis process	a. it produces nutrients which is important for soil fertility
2. Respiration process	.b. it produces light which is important for plants
3. Decomposition process	c. it produces oxygen gas which is important for breathing
	d. it produces carbon dioxide which is important for plants

1……. 2…… 3…….

3. Put (√) or (x):

1. There are some activities that don't need energy like listening to music ( )
2.Butterfly can produce its own food from sunlight ( )
3. Hard works or severe exercises need a lot of energy ( )
4.Producers don't need consumers to survive ( )
5.All living organisms don't need energy to survive( )
6.Glucose sugar that is produced by producers has a low amount of energy( )
7. Some producers can live in hot sunny weather, but they cannot live in a completely dark room. ( )
8. Producers and consumers use carbon dioxide gas for making their food( )
9. Birds are secondary consumers, because they eat insects that feed on plants. ( )
10. Eagle is a tertiary consumer, where it is a large meat-eating animal ( )
11.The first link in any food chain is a consumer ( )
12. Consumers depend on the Sun indirectly to get their food .( )
13.Recycling nutrients back to the ecosystem is the main function of the consumers( )
14. The predator is a consumer that eats another animal ( )

4.Write the scientific term of each of the following

1. The process that takes place inside plants through which we can get oxygen (……)

2. It is the primary source of energy for all living organisms on the Earth(……)
3. A type of living organisms that can produce its own food by absorbing sunlight (……)
4. The sugar that is formed inside plants during photosynthesis process(……)
5. The gas that is present in air and necessary for the formation of plant food (……)
6. The gas that is produced from photosynthesis process(……).
7. Living organisms that both humans and animals need to survive(……).
8. A group of living organisms that can live on decaying dead organisms(……)
9. It is a process through which decomposers can recycle nutrients back into the soil (……).
10.It is a model that shows how energy flows from one organism to another in an ecosystem (……)
11.The animal that is eaten by another animal. (……)
12. The consumer that hunts and eats another animal(……)

5.Give reasons for

1.Human needs to eat some animals and plants .

.……..

.2.Sunlight is important for all living organisms .

.……..

3.Consumers depend on producers to get their energy

.……..

4. Soil fertility depends on decomposers .

……..

6. What happens if

1.There is no sunlight reaches the Earth's surface

……..

1.All primary consumers disappear from a certain food chain

……..

2.All types of decomposers are absent from an ecosystem. .

……

Duck)7-Form the following food chain by using the words between brackets, then complete the sentences below(- Grasses - Fox

(1) (2) (3)

…… → …… → ……

a.This food chain doesn't contain consumer

b. The group of living organisms that is responsible for the final link of this food chain is……..

c. Grasses use ……..energy of the Sun during……. process

Lesson (3) Food Chains

Activity 9 Food Chains

Now, let's make a model of a food chain

> Complete the following food chain model using these words:

(Bird-Grass-Snake- Hawk)

Give a reason for اعط سببا ل

Some living organisms obtain their needed energy by eating other living organisms?

تحصل بعض الكائنات الحية على الطاقة التي تحتاجها عن طريق تناول الكائنات الحية الأخرى؟

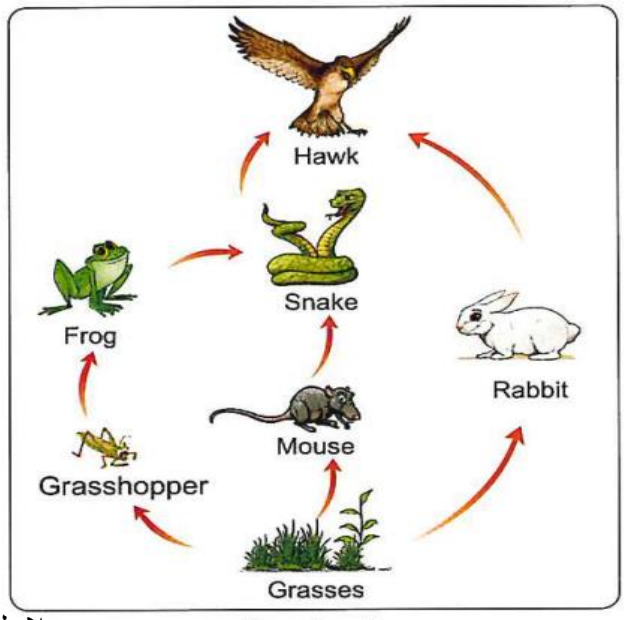
Because they cannot get energy directly from the Sun.

لأنهم لا يستطيعون الحصول على الطاقة مباشرة من الشمس

Activity 10 Food Webs النشاط 10 شبكات الغذاء

All living organisms including you, interact in food webs and we can draw these webs to show how organisms are connected within ecosystem.

تتفاعل جميع الكائنات الحية بما في ذلك أنت ، في شبكات الغذاء ويمكننا رسم هذه الشبكات لإظهار كيفية ارتباط الكائنات الحية داخل النظام البيئي



Food web

Food web: الشبكة الغذائية

It is a model that shows many different feeding relationships among living organisms.

إنه نموذج يُظهر العديد من علاقات التغذية المختلفة بين الكائنات الحية

Interconnected food chains سلاسل الغذاء المترابطة

A food web is made up of several interconnected food chains, food chains show the relationship of food and energy that passes from one organism to another, where:

تتكون الشبكة الغذائية من عدة سلاسل غذائية مترابطة ، سلاسل الغذاء تظهر علاقة الغذاء والطاقة التي تنتقل من كائن حي إلى آخر ، حيث-.

the Sun provides energy for producers such as plants to make their own food during photosynthesis process.

توفر الشمس الطاقة للمنتجين مثل النباتات لصنع طعامهم أثناء عملية التمثيل الضوئي

Then, plants provide food for a series of consumers which may eat only plants eat both plants and animals. So, the ways in which many food chains interact within an ecosystem form a food web

لذلك ، فإن الطرق .بعد ذلك ، توفر النباتات الغذاء لسلسلة من المستهلكين الذين قد يأكلون فقط النباتات التي تأكل النباتات والحيوانات التي تتفاعل بها العديد من السلاسل الغذائية داخل نظام بيئي تشكل شبكة غذائية

Activity 12 Interactions in food webs التفاعلات في شبكات الغذاء

Food webs show that different organisms in an ecosystem are connected to allow energy to pass between them to survive, where

تظهر شبكات الغذاء أن الكائنات الحية المختلفة في النظام البيئي مرتبطة للسماح للطاقة بالمرور بينها للبقاء على قيد الحياة ، حيث

-Producers are eaten by some consumers

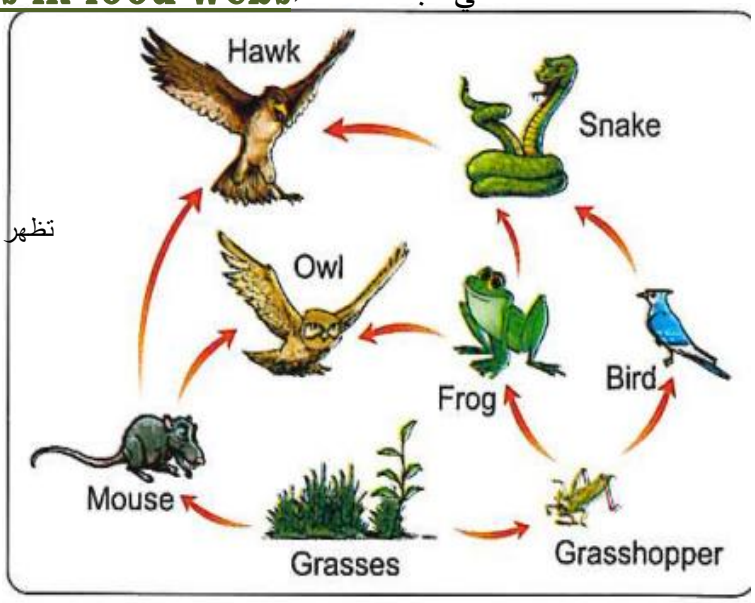
يأكل بعض المستهلكين المنتجين

-Some consumers are eaten by other consumers.

يؤكل بعض المستهلكين من قبل مستهلكين آخرين

-Some consumers may eat the same producer or prey

قد يأكل بعض المستهلكين نفس المنتج أو الفريسة



Food web

Give a reason for أعط سببا ل

It is better to use a food web to show interactions among living organisms than a food chain.

من الأفضل استخدام شبكة الغذاء لإظهار التفاعلات بين الكائنات الحية بدلاً من استخدام السلسلة الغذائية

Because a food web shows interactions among many food chains so, the food web contains many organisms, while a food chain shows interactions between just few organisms

لأن شبكة الغذاء تُظهر تفاعلات بين العديد من سلاسل الغذاء ، فإن شبكة الغذاء تحتوي على العديد من الكائنات الحية ، بينما تُظهر السلسلة الغذائية تفاعلات بين عدد قليل من الكائنات الحية

Classify the following organisms in the table below :

(Hawks – Grasses – Insects – Trees – Alligators – Mice)

Producers	Predators	Prey
.....	.....	.....
.....	.....	.....
.....	.....	.....

Exercises on Lesson (3)

1-Choose the correct answer?

1.All the following are types of food for primary consumers, except .

a. grasses b. seeds c. fruits d. eagles

2.Both animals and humans bodies ……..

a. can absorb sunlight to make their own food
b. cannot absorb sunlight to make their own food
c. breathe carbon dioxide gas
d. don't need water to drink

3. A hawk can eat ……when snakes are completely disappear from an ecosystem

a. grasses b. grasshoppers c. birds d. leaves

4. It is better for any predator to depend on ……..to get its energy and survive

a. one species of consumers only b. many species of consumers
c. one species of decomposers only d. many species of decomposers

5. All types of plants are similar in all the following characters, except they

a. are able to make photosynthesis process b. are eaten by primary consumers
c. can feed on predators d. live in different types of ecosystems

6. Human is a…….. living organism

a. producer b. consumer c. decomposer d. predator

7. Secondary consumers can eat only……..

a. decomposers b. producers c. primary consumers d. tertiary consumers

8. Food web shows interactions between……

a few nonliving things. b. many nonliving things
c. few living organisms d. many living organisms

9. In a food chain, there is a ……..found between a producer and a secondary consumer

a. decomposer b. predator c. primary consumer d. tertiary consumer

2. Put (√) or (x):

1. A hawk can get directly its needed energy by eating booties ( )
2. There are some consumers that can eat both plants and animals ( )
4. In a food chain, the energy can pass from a producer to a nonliving thing then to a primary consumer ( )
4. Hawks, crocodiles(alligators) and sharks are predators ( )
5. Human can eat plants and animals ( )
6. Food web is the interconnected food chains that shows many different feeding relationships
7. All living organisms depend on each other to get energy ( )

3. Complete the following sentences by using the words between brackets

(Primary consumers – producers - secondary consumer)

1. The interaction among many food chains is known as…….
2. In any food chain, plants are considered as…….
3. If a frog eats an insect that feeds on plants, this means that the frog is a……
4. Humans can eat producers and……..

Lesson (4) Interactions in food webs

Activity 17 Plant Community Ecologist عالم بيئة المجتمع النباتي

Activity 17

Dr: Becky Barak الدكتورة: بيكي باراك
is a plant community ecologist
Which means she studies groups of plants
عالمة بيئة نباتية مما يعني أنها تدرس مجموعات من النباتات
She learned about ecology
She took a class in restoration ecology and that was where she learned about restoration, which is rebuilding habitats that are damaged)
تعلمت عن البيئة أخذت فصلًا دراسيًا في علم بيئة الاستعادة حيث تعلمت عن الترميم ، وهو إعادة بناء البيئات التي تضررت (

Seed Dispersal

Dr: Becky Barak has learned that different plants need different ways to disperse their seeds
الدكتور بيكي باراك: تعلمت أن النباتات المختلفة تحتاج إلى طرق مختلفة لتفريق بذورها
Different plants need different ways to transport (disperse) their seeds.
تحتاج النباتات المختلفة إلى طرق مختلفة لنقل (تفريق) بذورها.
-There are plants with sticky seeds that stick to human clothes or an animal's body, so human or animal can carry these seeds to another place where seeds fall down.
هناك نباتات ذات بذور لزجة تلتصق بملابس الإنسان أو بجسم الحيوان ، لذلك يستطيع الإنسان أو الحيوان نقل هذه البذور إلى مكان آخر تسقط فيه البذور. -
-Other plants have light seeds that are dispersed by wind, these seeds are carried away by winds to new habitats to grow in other places.
نباتات أخرى لها بذور خفيفة تشتت بفعل الرياح ، هذه البذور تنقلها الرياح إلى موائل جديدة لتنمو في أماكن أخرى.-

Careers in Ecology

If you are interested in the natural world, you can share in conservation or restoration work in your area to help take care of plants and animals.
إذا كنت مهتمًا بالعالم الطبيعي ، فيمكنك المشاركة في أعمال الحفظ أو الترميم في منطقتك للمساعدة في رعاية النباتات والحيوانات. -
Your interest in nature now could lead to a career in ecology in the future.
قد يؤدي اهتمامك بالطبيعة الآن إلى الحصول على وظيفة في علم البيئة في المستقبل.

Exercises on Lesson (4)

1-Choose the correct answer?

1.Restoration ecology means

a. damaging the rebuilt habitats
b. rebuilding habitats that are damaged
c. throwing plastic products in seas.
d. throwing plastic products in deserts

2. All the following ways help plants to disperse their seeds, except

a. water b. air c. animal bodies. d. sunlight

3. Plants with sticky seeds need ……..to stick to disperse and grow in a new habitat

a. air b. water
c. light energy from the Sun. d. body of a living organism

4.Wind play an important role in dispersing…… seeds

a. small light b. big heavy c. sticky d. floating

3. Put (√) or (x):

1. Ecologists should do their researches in natural areas that contain animals and plants( )
2.Rebuilding habitats that are damaged is known as restoration ecology. ( )
3. All plants need the same way to disperse their seeds ( )
4. Both of small light seeds and big heavy seeds can disperse by wind ( )

3. Give reasons for

1-Sticky seeds of some plants can stick to human clothes or an animal's body

……

2-Studying restoration ecology is very important

……

Concept 1.3

Change in food webs

Lesson (1) Changes in Food Webs

Changes in Food Webs التغييرات في شبكات الغذاء

Activity 1 Can You Explain

Pollution: It is the harms that happen to air, water or soil by substances that can harm living organisms.

•التلوث: هو الأضرار التي تلحق بالهواء أو الماء أو التربة بمواد يمكن أن تضر بالكائنات الحية.

What might happen to a food web when an organism or the environment changes within an ecosystem?

ماذا يمكن أن يحدث لشبكة الغذاء عندما يتغير كائن حي أو البيئة داخل نظام بيئي؟

All organisms may be affected, where قد تتأثر جميع الكائنات الحية ، حيث

-If plants (producers) were disappeared from an ecosystem, the consumers will need to move to other places to search for food or they will die

إذا اختفت النباتات (الكائنات المنتجة) من نظام بيئي ، فسيحتاج المستهلكون إلى الانتقال إلى أماكن أخرى للبحث عن الطعام أو سيموتون

Protection the marine environment in Palau island

حماية البيئة البحرية في جزيرة بالاو

On any island, we can observe that what i s happening on land affects what is happening in the marine environment

في أي جزيرة ، يمكننا أن نلاحظ أن ما يحدث على الأرض يؤثر على ما يحدث في البيئة البحرية

People in Palau uses different conservation programs to protect the marine environment and its resources by creating well-designed protected marine environment, where

يستخدم الأشخاص في بالاو برامج حماية مختلفة لحماية البيئة البحرية ومواردها من خلال إنشاء بيئة بحرية محمية جيدة التصميم ، حيث

People in Palau control the human activities on land to keep the protected marine environment from pollution by avoid throwing waste materials in ocean

يتحكم الناس في بالاو في الأنشطة البشرية على الأرض للحفاظ على البيئة البحرية المحمية من التلوث عن طريق تجنب رمي النفايات في المحيط

Fishers must not overfishing the coral reefs to conserve the marine environment

يجب على الصيادين عدم الإفراط في صيد الشعاب المرجانية للحفاظ على البيئة البحرية

Activity 3 Changes in Food Webs النشاط 3 التغير في شبكة الغذاء

When an ecosystem changes, food webs change too, where

• Relationships between organisms in an ecosystem play an important role in keeping this ecosystem balanced

عندما يتغير نظام بيئي ، تتغير شبكات الغذاء أيضًا ، أين •

تلعب العلاقات بين الكائنات الحية في النظام البيئي دورًا مهمًا في الحفاظ على توازن هذا النظام البيئي

• When organisms are removed or their role in an ecosystem changes, this ecosystem could be destroyed (collapsed) and also food webs would change.

•عندما تتم إزالة الكائنات الحية أو يتغير دورها في نظام بيئي ، يمكن تدمير (انهيار) هذا النظام البيئي وكذلك ستتغير شبكات الغذاء .

How does ecosystem change affect food webs

كيف يؤثر تغيير النظام البيئي على شبكات الغذاء

What would happen if ماذا سيحدث لو	Result النتيجة	Reason السبب	
There is a gentle rain in the desert هناك أمطار خفيفة في الصحراء	The desert ecosystem may be improved يمكن تحسين النظام البيئي الصحراوي	Because rainwater will feed the plants (producers) which will feed the organisms لأن مياه الأمطار ستغذي النباتات (المنتجين) التي ستغذي الكائنات الحية	
There is a heavy rain in the desert هناك أمطار غزيرة في الصحراء	The desert ecosystem may be harmed قد يتضرر النظام البيئي الصحراوي	Because the water of heavy rain will cause flooding which will destroy the ecosystem لأن مياه الأمطار الغزيرة ستسبب فيضانات ستدمر النظام البيئي	
There is a drought and all the grass dies هناك جفاف ويموت كل العشب	The food web in the ecosystem may be destroyed يتم تدمير الشبكة الغذائية في النظام البيئي	Because the plants will die and also the organisms will die لأن النباتات سوف تموت وكذلك الكائنات الحية	
There are many top predators in the food web هناك العديد من أفضل الحيوانات المفترسة في شبكة الغذاء	The other organisms in the food web may be harmed قد تتضرر الكائنات الحية الأخرى في الشبكة الغذائية	Because the top predators will eat all the organisms سوف تموت لأن المفترسات العليا سوف تأكل كل الكائنات الحية	

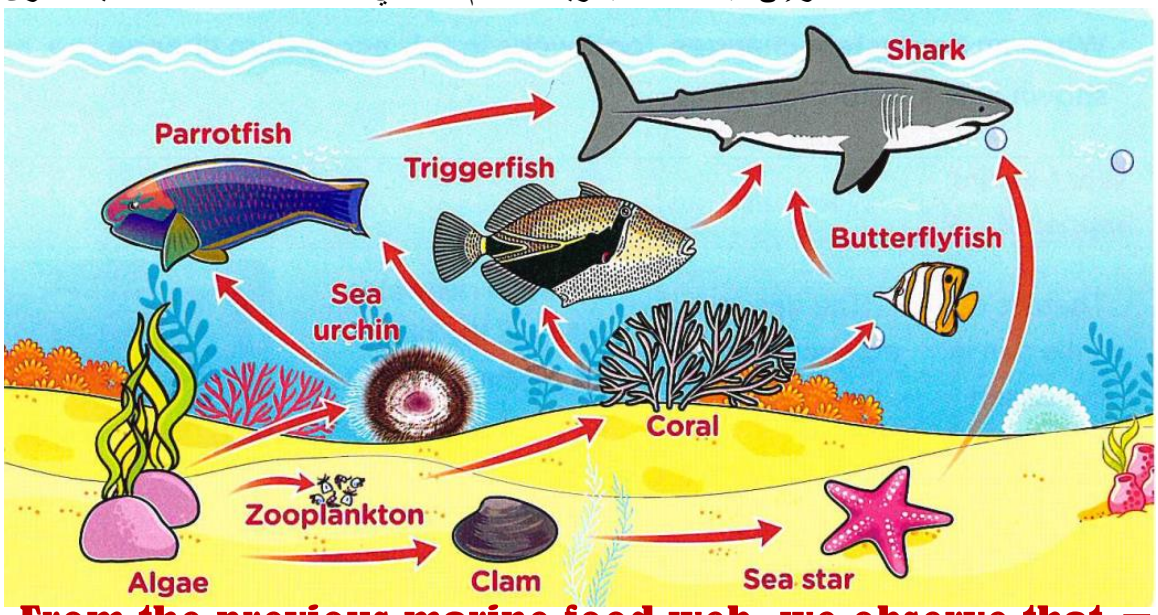
Food webs الشبكات الغذائية

The food web is a model shows different feeding relationships among. living organisms

الشبكة الغذائية هي نموذج يُظهر علاقات تغذية مختلفة بين الكائنات الحية

Look at this marine food web, then observe which organisms eat other organisms

انظر إلى شبكة الغذاء البحرية هذه ، ثم لاحظ أي الكائنات تأكل الكائنات الحية الأخرى.



From the previous marine food web, we observe that :

Algae produce their own food
تنتج الطحالب طعامها

The zooplankton, clam and sea urchin feed on the algae
تتغذى العوالق الحيوانية وقنفذ البحر وقنفذ البحر على الطحالب

The sea star feed on the clam
Coral feeds on the zooplankton
نجم البحر يتغذى على وقنفذ البحر يتغذى المرجان على العوالق الحيوانية

Butterfly fish and triggerfish feed on coral
Parrotfish feeds on coral and sea urchin
تتغذى أسماك الفراشة وسمك الزناد على الشعاب المرجانية- تتغذى أسماك الببغاء على المرجان

The shark feeds on the sea star and the three different fish
يتغذى القرش على نجم البحر والأسماك الثلاثة المختلفة

My ecosystem النظام البيئي الخاص بي

In an ecosystem the Sun produces energy that the plants take, then this energy transfers to consumers that when they die, the decomposers break them down into nutrients that can be returned to the ecosystem

في نظام بيئي ، تنتج الشمس الطاقة التي تأخذها النباتات ، ثم تنتقل هذه الطاقة إلى المستهلكين الذين عندما يموتون ، تقسمهم المُحلِّلات إلى عناصر مغذية يمكن إعادتها إلى النظام البيئي.

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
environment	البيئة	Protection	حماية
marine	البحرية	Palau island	جزيرة بالاو
Changes	التغييرات	conservation	حماية
Food Webs	شبكات الغذاء	marine	البحرية
programs	برامج	protect	لحماية
designed	مصمم	zooplankton	العوالق الحيوانية
clam	محارة	sea urchin	قنفذ البحر
Butterfly fish	أسماك الفراشة	triggerfish	سمكة الزناد
Parrotfish	أسماك الببغاء	destroy	ستدمر
improved	تحسين	Coral	المرجان
destroyed	تدمير	collapsed	انهيار

Concept 1.3

Exercises on Lesson (1)

1-Choose the correct answer?

1. The Sun provides the Earth with

a. light only b. warm only c. light and warm d. light and sound

2. On extreme hot climate, the water of a lake

a. increases due to evaporation. b. decreases due to evaporation.
c. changes into ice d. has a lower temperature

3.All the following factors pollute the water, except

a. sunlight. b. animals wastes c. human wastes d. plastic garbage

4. If the amount of grasses increases in an ecosystem, this directly increases the number of

a. caracals b. hawks c. rabbits d. lions

5.When the number of…… the amount of grasses in an ecosystem . increase

a. producers decreases b. decomposers decreases
c. primary consumers increases d. secondary consumers increases

6.Overfishing and throwing plastic garbage in the sea affect the survival of ……. directly

a desert organisms b. marine organisms
c. rainforest organisms d. rodents

7.All the following are human activities that affect a marine ecosystem except……..

a. flooding b. throwing human wastes
c. overfishing d. throwing plastic garbage

8.When there is a gentle rain in a desert ecosystem, this ecosystem may

a. harmed. b. improved c. destroyed d. collapsed

9.All the following are top predators, except ……

a. hawks b. tigers c. butterflyfish d. lions

10.The marine food web usually started with……..

a. clam b. algae c. zooplankton d. parrotfish

11.If clam are completely removed from a marine ecosystem, the survival of……. may be affected

a. triggerfish b. sharks c. sea urchin d. sea stars

2. Put (√) or (x):

1. If producers were removed from an ecosystem, the consumers will need to move away ( )
2. Overfishing is one of the climate changes that affects the marine ecosystem . ( )
3. What is happening on land doesn't affect what is happening in marine ecosystem( )
4. Food webs don't change if their surrounding environments get changed ( )
5. If we introduce a new predator to an ecosystem, this ecosystem will be affected( )
6. If there is a heavy rain in a desert ecosystem, it will be harmed ( )
7. Zooplankton can make their own food by photosynthesis ( )
8. In a marine food web, there are many top predators like sea urchin ( )
9. Top predators are decomposers that present at the top of food chains ( )

4.Write the scientific term of each of the following

1. It is the harms that happen to air, water and soil due to human activity (…….)
2. A human activity that leads to decreasing the number of fish and affecting many marine food webs(…….)
3. They are consumers that exist at the top of food chains(…….)

5.Give reasons for

1.When the number of one species of consumers in an ecosystem increases they will die

……

2.Death of algae may leads to moving sharks away to another places

……

6.What happens if …….?

1. Throwing big amounts of plastic garbage and waste materials in water

……

2. A small lake is exposed to extreme hot climate for several months

……

3.The number of secondary consumers in an ecosystem decreases .

……

:7. Study the following food chain in an ecosystem, then complete the table below

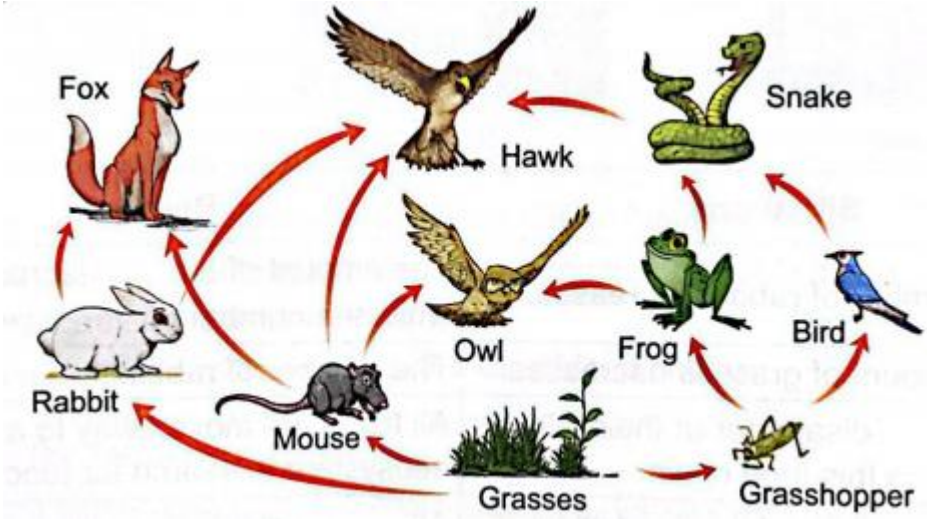
Grasses Rabbit Fox

Situations	Results
1. The number of rabbits increases.	The amount of ..... decreases, while the number of ..... increases.
2. The amount of grasses decreases.	The number of rabbits .....
3. All ..... disappear or their role change in this food chain.	All foxes will move away to another ecosystem to search for food.
4. The ecosystem of this food chain is affected by severe drought conditions.	All ..... die, because there is no water to make their own food.

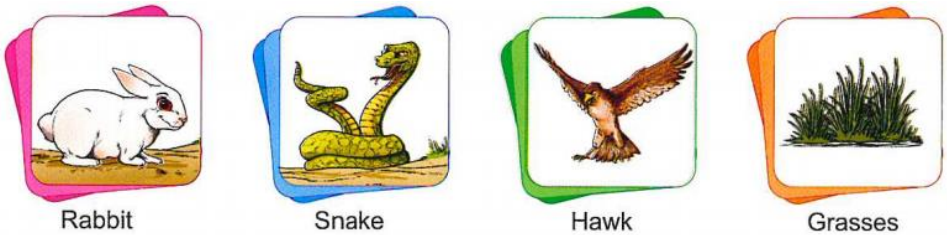
Lesson (2) Energy Flow Body Model

Activity to make a model that shows the flow of energy through a food web.

A picture of a food web.

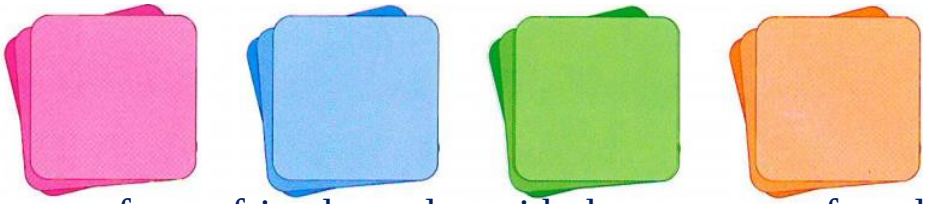


Cards labeled with organisms •



.

Paper squares (represent the flow of energy in an ecosystem



Steps ►

1.Choose some of your friends to play with them a game of predator-prey tag

2.Observe the picture of the food web carefully with your friends

1-اختر بعض أصدقائك ليلعبوا معهم لعبة مفترس فريسة .2راقب صورة شبكة الغذاء بعناية مع أصدقائك

3. Give each one of your friends a card labeled with an organism from the above food web and a paper square

3.أعط كل واحد من أصدقائك بطاقة مكتوب عليها كائن حي من شبكة الطعام أعلاه ومربع ورقي

4. Start the game with your friends. If one of your friends becomes a prey to another friend which is a predator, . so the prey gives his paper square to the predator

4.ابدأ اللعبة مع أصدقائك .إذا أصبح أحد أصدقائك فريسة لصديق آخر وهو مفترس ، فإن الفريسة تعطي مربعها الورقي للمفترس.

Observation When a predator feeds on a prey, it gains energy, so the energy transfers from the prey to the predator.

عندما يتغذى مفترس على فريسة ، فإنه يكتسب الطاقة ، وبالتالي تنتقل الطاقة من الفريسة إلى المفترس.

Conclusion ►

The energy in the overall system remains as the same,:

تظل الطاقة في النظام العام كما هي ،

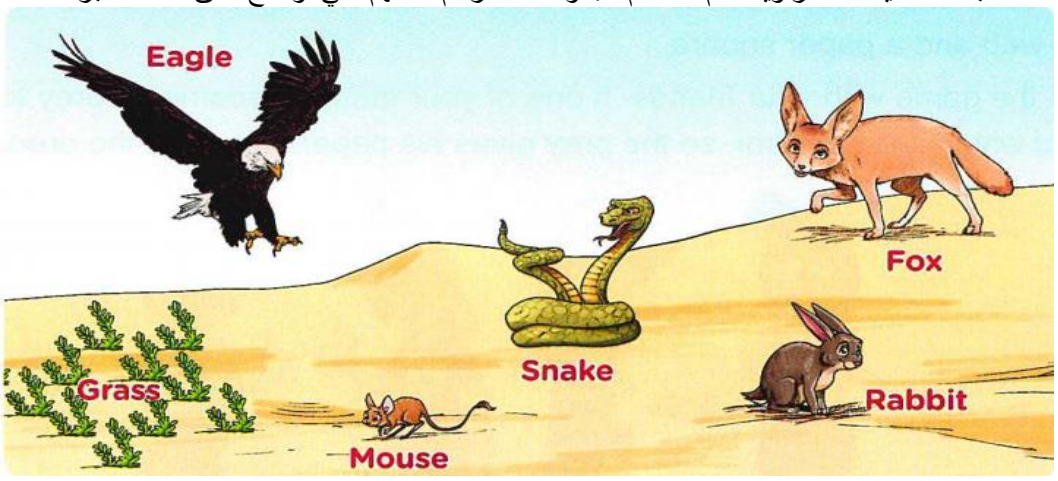
Although energy is transferred between living organisms, most of the energy is recycled by decomposers back into the ecosystem

- على الرغم من أن الطاقة تنتقل بين الكائنات الحية ، فإن معظم الطاقة يتم إعادة تدويرها بواسطة أجهزة التحلل إلى النظام البيئي.

Activity 6 Desert Food Web

Look at this desert food web, and then use the table below to draw the arrows that show the flow of energy through this food web

انظر إلى هذه الشبكة الغذائية الصحراوية ، ثم استخدم الجدول أدناه لرسم الأسهم التي توضح تدفق الطاقة عبر هذه الشبكة الغذائية



Number of arrows	Direction of arrows
↑↑ (2 blue arrows)	Comes out of grass
↑ (1 green arrow)	Goes to the snake
↑↑↑ (3 red arrows)	Goes to the fox
↑↑↑ (3 black arrows)	Goes to the eagle

What would happen To the rabbits (hares) if all the grass were removed from the previous food web

Rabbits would not find any type of food, therefore they would die.

ماذا قد يحدث للأرانب (الأرانب البرية) إذا تمت إزالة كل العشب من شبكة الغذاء السابقة لن تجد الأرانب أي نوع من الطعام ، لذلك تموت .إلى النسور

To the eagles if all the grass were removed from the previous food web.

At first, the eagles would not be affected

but when the rabbits die, the eagles would have less food

إذا تمت إزالة كل العشب من شبكة الغذاء السابقة .في البداية ، لن تتأثر النسور ولكن عندما تموت الأرانب ، سيكون لدى النسور طعام أقل

التغييرات السكانية

Activity 7 Population Changes

Population is the number of organisms of one type of species living in an area
السكان هو عدد الكائنات الحية لنوع واحد من الأنواع التي تعيش في منطقة ما

In an ecosystem, all species depend on other species for survival, so an increase or decrease in one species affect the population of other species causing a population change
في النظام البيئي ، تعتمد جميع الأنواع على الأنواع الأخرى للبقاء على قيد الحياة ، لذا فإن الزيادة أو النقصان في نوع واحد يؤثر على تعداد الأنواع الأخرى مما يتسبب في تغيير السكان

an example shows how a population of one species affects the population of other species
مثال يوضح كيف تؤثر مجموعة من نوع واحد على سكان الأنواع الأخرى

Seabirds الطيور البحرية

.They build their nests on the top of mountain cliffs
يبنون أعشاشهم على قمة المنحدرات الجبلية

They dive deep down into the sea to feed on small fish which are the main source of food for many seabirds
تغوص في أعماق البحر لتتغذى على الأسماك الصغيرة التي تعد المصدر الرئيسي للغذاء للعديد من الطيور البحرية

The small fish feed on microorganisms that float on the surface of the sea
الأسماك الصغيرة التي تتغذى على الكائنات الحية الدقيقة تطفو على سطح البحر.

Microorganisms الكائنات الدقيقة

They are organisms that are too small for people to see with only their eyes
إنها كائنات حية صغيرة جدًا بحيث لا يستطيع الناس رؤيتها بأعينهم فقط

- They can make their own food, so they are the producers in the marine food web يمكنهم صنع طعامهم بأنفسهم ، لذا فهم المنتجون في شبكة الغذاء البحرية

G.R. They are found in cold water habitats? توجد في موائل المياه الباردة

Because they need this water to survive لأنها تحتاج إلى هذه المياه للبقاء على قيد الحياة

What will happen to microorganisms if the climate is changed and the water become warm?
ماذا سيحدث للكائنات الحية الدقيقة إذا تغير المناخ وأصبح الماء دافئًا؟

1-Microorganisms will move toward an area where the water is cooler
سوف تتحرك الكائنات الحية الدقيقة نحو منطقة يكون فيها الماء أكثر برودة

2-Small fish that feed on these microorganisms will also move to a new habitat
، الأسماك الصغيرة التي تتغذى على هذه الكائنات الحية الدقيقة ستنتقل أيضًا إلى موطن جديد

3-Seabirds will not have a food source,
Some of them will move to a new habitat, some will die
للطيور البحرية عندما لا يكون مصدر غذاء ، ينتقل بعضها إلى موطن جديد ، يموت البعض.

The climate change affects the population of a species, where
يؤثر تغير المناخ على تعداد الأنواع ، حيث:

When the climate change is suitable, the population of a species increases-
-عندما يكون تغير المناخ مناسبًا ، يزداد عدد الأنواع.

When the climate change is unsuitable, the population of a species decreases - because the organisms would either die or move to another place
-عندما يكون تغير المناخ غير مناسب ، ينخفض عدد الأنواع لأن الكائنات الحية إما يموت أو ينتقل إلى مكان آخر.

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
flow of energy	تدفق الطاقة	Seabirds	للطيور البحرية
depend	تعتمد	Microorganisms	الكائنات الدقيقة
Suitable	مناسب	climate change	تغيرات مناخية
nests	أعشاش	mountain cliffs	المنحدرات الجبلية
population change	تغيير السكان	arrows	أسهم
species	الأنواع	Float	تطفو
population	سكان	Remove	إزالة
transferred	تنتقل	habitat	موطن

Exercises on Lesson (2)

1-Choose the correct answer?

1. If there is a tertiary consumer in a food chain, this means that there is……..

a. a primary consumer only b. a secondary consumer only
c. a primary and a secondary consumers.
d. neither primary nor secondary consumers

2.The secondary consumer is considered as

a. a prey for primary and tertiary consumers
b. a predator for primary and tertiary consumers
c. a prey for primary consumer d. a prey for tertiary consumer

3.In a food chain, the energy transfer

a. from a predator to a prey. b. from a prey to a predator
c. from a predator to a producer. d. from a consumer to a producer

4. If all grasses were removed completely from an ecosystem, rabbits in this ecosystem will…..

a. increase b. decrease c. die d. not be affected

5. It is better for a predator in a food web, to have ……

a. only one type of decomposers. b. more than one type of decomposers
c. only one type of prey d. more than one type of prey

6-Any increase or decrease in the number of organisms of one type of species is known as

a. an ecosystem b. adaptation
c. a climate change d. a population change

7-If the climate change is suitable, the population of a species

a. will die b. will not be affected c. will increase d. will decrease

8.Seabirds build their nests

a. on the water surface b. on the top of mountain cliffs
c. deep down into the sea d. deep down into the river

9.All the following statements are correct except

a. Small fish can eat seabird b. Sharks can eat small fish
c. Small fish cannot eat seabird d. seabird cannot eat Sharks

10-The suitable habitat for microorganisms to survive is

a. will die b. will not be affected c. will increase d. will decrease

2. Put (√) or (x):

1. Most of living organisms are prey for some animals and also predators for others at the same time ( )
2. The Sun produces energy that decomposers use to make their food ( )
3. Any food chain can be formed of producers only ( )
4. Energy transfers when a prey loses energy to the predator which feeds on it .( )
5. A desert food chain doesn't contain any type of fish or sharks ( )
6. If the climate change is unsuitable, the population of a species will decrease ( )
7. In an ecosystem, all species depend on other species for survival ( )
8. Seabirds eat small fish that swim near the water surface ( )
9. Microorganisms are producers that small fish feed on to get energy( )

3. Write the scientific term of each of the following

1.They are consumers which feed on secondary consumers. (……)
2. They are living organisms that include bacteria and fungi, which return energy back to the soil (……)
3. It transfers between animals in a food web, to help them do their activities and survive (……)
4. is the number of organisms of one type of species live in an area(……)
5.Any increase or decrease in the number of organisms(……)
6.Flying living organisms that build their nests on the top of mountain cliffs and dive deeply into the sea to eat (……)
7.They are organisms that are too small for people to see with only their eyes (……)

4-Complete the following sentences using these words

.(population - decomposers - increase - photosynthesis - decrease - producers)

1-When seawater becomes warm, the number of microorganisms will……in .water, while in cold water their number will in ……water
2-Microorganisms float on water surface as they need sunlight to make…… process because they are considered the ……in the marine food web
3-The number of organisms of one type of species living in an area is called…….
4-The energy is recycled back to the environment with the help of……

5.Complete the following sentences

1. Predators of living organisms may be……. for other living organisms
2. Secondary consumers feed on ……consumers
3. All energy in all living organisms return back to the environment by the help of…….. organism
4. A predator get…… from the prey which feeds on.
5.If the climate change is suitable, the population of a species will ……
6.Small fish feed on . ……that float on the surface of the sea

6.Give reasons for

1. Change in the population of one species affects the population of other species.

……

7.What happens if …….?

1. The climate change is unsuitable for a population of one type of species.

……

2. The seawater becomes warm.

……

Habitat loss

Activity 9 Habitat loss النشاط 9 فقدان الموطن

• Habitats provide organisms with all the things they need to survive.

. From human activities that change the habitats in an ecosystem are: -

من الأنشطة البشرية التي تغير الموائل في النظام البيئي هي

-Building up more buildings and roads تشييد المزيد من المباني والطرق

-Throwing waste materials in water رمي المخلفات في الماء

- Overfishing in seas and oceans -الصيد الجائر في البحار والمحيطات

-Why are healthy habitats important to all organisms in a food web

لماذا تعتبر الموطن الصحية مهمة لجميع الكائنات الحية في الشبكة الغذائية

Because they provide organisms with resources that they need to survive as air, food, water and shelter, so if each species gets its needs to survive, there will always be enough food for each organism in the food web

لأنها تزود الكائنات الحية بالموارد التي تحتاجها للبقاء على قيد الحياة مثل الهواء والغذاء والماء والمأوى ، لذلك إذا حصل كل نوع على احتياجاته للبقاء على قيد الحياة ، فسيكون هناك دائمًا ما يكفي من الغذاء لكل كائن حي في شبكة الغذاء

When these habitats are destroyed, different organisms may not be able to survive and this will negatively affect the flow of energy in the food web

عندما يتم تدمير هذه الموائل ، قد لا تتمكن الكائنات الحية المختلفة من البقاء على قيد الحياة وسيؤثر ذلك سلبًا على تدفق الطاقة في الشبكة الغذائية.

.Human activities can also impact the weather and nonliving factors in an ecosystem, such as the temperature of ocean water

يمكن أن تؤثر الأنشطة البشرية أيضًا على الطقس والعوامل غير الحية في النظام البيئي ، مثل درجة حرارة مياه المحيط

.All of these changes can cause habitat loss which is one of the main causes of extinction

مثالاً على فقدان الموائل في نظام الشعاب المرجانية كل هذه التغييرات يمكن أن تتسبب في فقدان الموائل وهو أحد الأسباب الرئيسية للانقراض

Example of habitat loss in a coral reef system

Coral reefs الشعاب المرجانية

They are some of the most diverse and valuable ecosystems on Earth

إنها بعض من أكثر النظم البيئية تنوعًا وقيمة على وجه الأرض

They provide food and shelter for large numbers of fish and other marine organisms

أنها توفر الغذاء والمأوى لأعداد كبيرة من الأسماك والكائنات البحرية الأخرى.

They are important for tourism, where people travel to coral reefs for fishing or diving

إنها مهمة للسياحة ، حيث يسافر الناس إلى الشعاب المرجانية لصيد الأسماك أو الغوص

This help increase the visitors and income of local hotels, restaurants and other business

يساعد على زيادة الزوار ودخل الفنادق المحلية والمطاعم وغيرها من الأعمال

Coral bleaching ابيضاض الشعاب المرجانية

Coral reefs bleaching happens when the water temperature rises, where حيث ، يحدث ابيضاض الشعاب المرجانية عندما ترتفع درجة حرارة الماء :

When the water is very warm, coral reefs will get rid of the algae living in their tissues

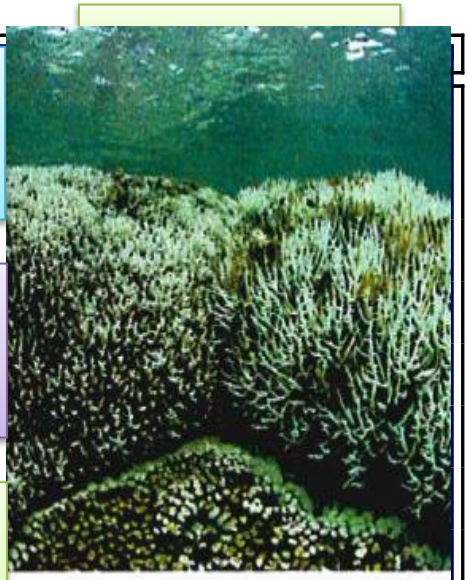
عندما يكون الماء دافئًا جدًا ، تتخلص الشعاب المرجانية من الطحالب التي تعيش في أنسجتها

This causes the coral reefs turn completely into white

هذا يتسبب في تحول الشعاب المرجانية بالكامل إلى اللون الأبيض

As a result of coral reefs bleaching, they often do not survive

نتيجة لتبييض الشعاب المرجانية ، فإنها لا تعيش في كثير من الأحيان



Coral reefs bleaching

Impact of coral bleaching تأثير ابيضاض المرجان

1-Destroying of coral reefs due to coral bleaching as a result of rising of water temperature has negative effects on many communities as

إن تدمير الشعاب المرجانية بسبب ابيضاض الشعاب المرجانية نتيجة لارتفاع درجة حرارة الماء له آثار سلبية على العديد من المجتمعات مثل

2-Fish and other marine organisms that depend on coral reefs for food and shelter may die or move to another habitat

قد تموت الأسماك والكائنات البحرية الأخرى التي تعتمد على الشعاب المرجانية في الغذاء والمأوى أو تنتقل إلى موطن آخر

3-People that depend on coral reefs and fish for food will be **negatively affected**

سيتأثر الأشخاص الذين يعتمدون على الشعاب المرجانية والأسماك في الغذاء سلبًا

Plastic Pollution التلوث البلاستيكي

large number of living organisms, don't find anything to feed on except plastic waste thrown in seas

عدد كبير من الكائنات لا تجد أي شيء تتغذى عليه باستثناء النفايات البلاستيكية التي يتم إلقاؤها في البحار

When the amount of plastic increases in the sea, the number of marine organism decreases, so marine food webs will be affected, leading to a breakdown in the flow of energy

عندما تزداد كمية البلاستيك في البحر ، يتناقص عدد الكائنات البحرية ، لذلك ستتأثر شبكات الغذاء البحرية ، مما يؤدي إلى انهيار تدفق الطاقة

The effect of plastic products on marine life

whales, sea turtles, seabirds and fish cannot often differentiate between real food and plastic

الحيتان والسلاحف البحرية والطيور البحرية والأسماك في كثير من الأحيان لا تستطيع التمييز بين الغذاء الحقيقي والبلاستيك

1-How do sea turtles get harmed by feeding on plastic

كيف تتأذى السلاحف البحرية من خلال التغذي على البلاستيك

Sea turtles cannot differentiate between a jellyfish and a piece of plastic in the water

لاتستطيع السلاحف البحرية التفريق بين قنديل البحر وقطعة من البلاستيك في الماء

Sea turtles eat a lot of plastic thinking that it is jellyfish, so they get harmed
السلاحف البحرية تأكل الكثير من البلاستيك معتقدة أنها قنديل البحر ، لذلك تتأذى

2-How do coral reefs get harmed by feeding on plastic
كيف تتضرر الشعاب المرجانية من خلال التغذي على البلاستيك

Due to the effect of UV rays coming from sunlight, plastic products get broken down into smaller pieces called micro-plastics (smaller than a grain of rice
بسبب تأثير الأشعة فوق البنفسجية القادمة من ضوء الشمس ، يتم تقسيم المنتجات البلاستيكية إلى قطع أصغر تسمى اللدائن الدقيقة (أصغر من حبة الأرز

When coral reefs filter the seawater to get their food, they ingest these micro-plastics that are as small as the pieces of food that coral reefs get from the water, so coral reefs get harmed
.).عندما تقوم الشعاب المرجانية بتصفية مياه البحر للحصول على طعامها ، فإنها تبتلع هذه اللدائن الدقيقة التي تكون صغيرة مثل قطع الطعام التي تحصل عليها الشعاب المرجانية من الماء ، وبالتالي تتضرر الشعاب المرجانية.

Notes

1-A large quantities of plastic are thrown into the marine environment every year most of them come from land
1. يتم إلقاء كميات كبيرة من البلاستيك في البيئة البحرية كل عام معظمها يأتي من الأرض.

2-Plastics are very harmful to marine organisms because they are toxic and sharp
البلاستيك ضار جدًا بالكائنات البحرية لأنه سام وحاد

3-If the amount of plastic in the sea or ocean increases, plastics will harm marine habitats and affect the organisms that live in the sea or ocean
3. إذا زادت كمية البلاستيك في البحر أو المحيط، فإن البلاستيك سيضر بالموائل البحرية ويؤثر على الكائنات الحية التي تعيش في البحر أو المحيط.

4-People can decrease their use of plastic products or recycle them instead of throwing them in the sea
4. يمكن للناس تقليل استخدامهم للمنتجات البلاستيكية أو إعادة تدويرها بدلاً من إلقائها في البحر.

► Check your understanding Put (v) or (x)

1-When the amount of plastic increases in the sea, the number of .marine organisms increases ( )

2-Plastics are very harmful to marine organisms as they are toxic and sharp ( )

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Habitat loss	فقدان الموطن	plastic products	المنتجات البلاستيكية
Coral bleaching	ابيضاض الشعاب المرجانية	large quantities	كميات كبيرة
Building	المباني	roads	الطرق
smaller than a grain of rice	أصغر من حبة الأرز	cannot differentiate	لا تستطيع التمييز
Throwing waste	ـالقاء المخلفات	Plastic Pollution	التلوث البلاستيكي
turtles eat plastic thinking that it is jellyfish	السلاحف البحرية تأكل الكثير من البلاستيك معتقدة أنها قنديل البحر	negatively affect	تاثير سلبي
visitors	الزوار	filter	تصفية
restaurants	المطاعم	hotels	الفنادق
income of local	الدخل المحلي	business	الأعمال

Exercises on Lesson (3)

1-Choose the correct answer?

1. Healthy marine environment is important for survival of…….

a. humans b. lions c. fish d. deers

2. All the following are healthy resources for marine food webs, except…….

a. clean water and food b. clean food and shelter

c. clean shelter and water d. polluted water, food and shelter

3.When the marine habitats are destroyed, the number of living organisms in their food webs is

a. increased b. decreased c. not changed d. doubled

4.All the following may occur due to habitat loss, except…….

a. increasing of population. b. decreasing of population

c. extinction of some organisms. d. decreasing of resources

5.Coral reefs are considered as …….

a. Insects b. bacteria c. ecosystems d. fungi

6.When water temperature increases, algae leave tissues of ……so they become bleached

a. seabirds b. coral reefs c. clam d. sharks

7.As a result of coral reefs bleaching, they will be ……

a. increase b. enlarge c. survived d. died

8.Plastic waste materials cause all the following to the marine except …… environment

a. breakdown in food webs b. pollution of water

c. increasing of population d. decreasing of population

9. Both of sea turtles and …….are present in the same marine food chain

a. deers b. jellyfish c. eagles d. tigers

10.When coral reefs ……the seawater, they may ingest microplastics

a. evaporate b. filter c. cool d. warm

11.Coral reefs are negatively affected by…….

a. rising water temperature only b. ingesting microplastics only

c. Both of rising temperature and ingesting microplastics.

d. neither rising of temperature nor ingesting microplastics.

2. Put (√) or (x):

1.Healthy habitats provide living organisms with clean air, healthy food and water ( )

2. The flow of energy in food webs is not affected when the natural habitats are destroyed ( )

3.Human activities impact the nonliving things in an ecosystem ( )

4.Healthy coral reefs have no benefit to fish but they are important for tourism( )
5.When the temperature of seawater decreases, coral reefs receive more algae ( )
6.Coral bleaching occurs as a result of throwing plastic in seawater( )
7.Living organisms in seas and oceans cannot differentiate between real food and plastic waste materials( )
8. Jellyfish can get its energy by eating the sea turtle ( )
9. Coral reefs filter the seawater to get their needed food ( )

3.Write the scientific term of each of the following

1.It is a condition in which coral reefs turn completely into (……..) white
2. Small pieces of plastics in the size of rice grains and they cause harms to marine organisms(……..)
3. Marine ecosystems that provide food and shelter for corals, fish and other .marine organisms

4. Complete the following sentences using these words

(extinction - overfishing - shelter - toxic - predator))

1. Healthy natural resources include clean air, healthy food, water and suitable….
2. The human activity that directly decreases the marine population is …….
3. Habitat loss is not only decrease marine population but also it is one o main causes of…….
4. When a sea turtle eats a jellyfish, this means that the sea turtle is a……. living organism
5. Plastic waste materials are very harmful to marine organisms, because they are…… and sharp

5.Give reasons for

1.Coral reefs are important for human communities

……

2. Plastics are very harmful to marine organisms

……

6- What happens if

.1-Plastic products expose to sunlight

……

Lesson (4) Habitat Restoration

Activity 13 Habitat Restoration النشاط13 استعادة الموطن

There are ways through which we can restore the habitat leading to a healthy and balanced ecosystem

هناك طرق يمكننا من خلالها استعادة الموطن المؤدية إلى نظام بيئي صحي ومتوازن

Restoration projects allow scientists to find out better solutions for reducing the negative impacts of human activities

مشاريع الاستعادة تسمح للعلماء بإيجاد حلول أفضل لتقليل الآثار السلبية للأنشطة البشرية

Human activities can cause big changes to the environment such as:

When many plants are removed, riverbanks erode, so floods may reach farther areas when wetlands are drained

يمكن أن تسبب الأنشطة البشرية تغييرات كبيرة في البيئة مثل :عندما تتم إزالة العديد من النباتات ، تتآكل ضفاف الأنهار ، لذلك قد تصل الفيضانات إلى مناطق أبعد عندما يتم تجفيف الأراضي الرطبة

Once harm occurs to the environment, scientists, engineers and citizens on"Habitat restoration"work

بمجرد حدوث ضرر للبيئة ، يعمل العلماء والمهندسون والمواطنون على "استعادة الموطن "

Habitat restoration•استعادة الموطن

It is the process of returning a habitat back to its natural state before harm was done

إنها عملية إعادة الموطن إلى حالته الطبيعية قبل حدوث الضرر.

The importance of habitat restoration projects

أهمية مشاريع ترميم الموائل تحاول مشاريع استعادة الموطن

Habitat restoration projects try to repair all parts of the habitat, where they help prevent species from extinction by restoring the habitat (including the resources of food, water and shelter) to the way it was before its damage

إصلاح جميع أجزاء الموطن ، حيث تساعد في منع الأنواع من الانقراض من خلال استعادة الموائل (بما في ذلك موارد الغذاء والماء والمأوى) كما كانت قبل تلفها

Rebuilding coral reefs One example of restoring a habitat is "a coral reef rehabilitation project" that happens in the Arabian Gulf, where

إعادة بناء الشعاب المرجانية أحد الأمثلة على استعادة الموائل هو "مشروع إعادة تأهيل الشعاب المرجانية" الذي يحدث في الخليج العربي ، حيث

Scientists collect small parts of different coral species and then move them to a "nursery".

يجمع العلماء أجزاء صغيرة من مختلف الأنواع المرجانية ثم ينقلونها إلى "مشتل ".

Nursery is an area in the sea, where scientists take care of small pieces of coral until they grow up and can be moved back to the reefs where they were dying

المشتل هي منطقة في البحر ، حيث يعتني العلماء بقطع صغيرة من الشعاب المرجانية حتى تكبر ويمكن إعادتها إلى الشعاب المرجانية حيث كانت تموت

• The healthy coral reefs can continue growing and reproducing to make new coral reefs again

الشعاب المرجانية السليمة يمكن أن تستمر في النمو والتكاثر لتكوين شعاب مرجانية جديدة مرة أخرى

Protecting coral reefs from plastic pollution

حماية الشعب المرجانية من التلوث البلاستيكي

The world-famous coral reefs of the Red Sea .are home to many marine organisms

•الشعاب المرجانية المشهورة عالميًا في البحر
الأحمر هي موطن لكثير من الكائنات البحرية .

In Egypt, coastal communities near the coral reefs applied a new way of life known as a "zero plastics", where people in these communities

Replace plastic forks with wooden ones - Replace plastic bags with cloth ones -

في مصر طبقت المجتمعات الساحلية بالقرب من الشعاب المرجانية طريقة جديدة للحياة تُعرف باسم "صفر من البلاستيك" حيث يعيش الناس في هذه المجتمعات -استبدال الشوكات البلاستيكية بأخرى خشبية. - استبدال الأكياس البلاستيكية بأخرى من القماش

What happens if A habitat is not restored

ماذا يحدث إذا ...لا يتم استعادة الموطن

Many species in this habitat may be lost, because they don't have their needs to Survive.

، ، ..قد يتم فقد العديد من الأنواع في هذا الموطن ، لأنها لا تحتاج إلى البقاء على قيد الحياة.

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
restored	استعادة	habitat	الموطن
balanced ecosystem	نظام بيئي متوازن	zero plastics	صفر من البلاستيك
Protecting	حماية	riverbanks erode	تتآكل ضفاف الأنهار
plastic pollution	التلوث البلاستيكى	coral reefs	الشعب المرجانية
nursery	مشتل	habitat restoration	استعادة الموطن
wetlands	الأراضي الرطبة	projects	مشاريع
reproducing	التكاثر	famous	مشهورة
continue growing	تستمر في النمو	Rebuilding	إعادة بناء
take care	يعتني	Arabian Gulf	الخليج العربي

Exercises on Lesson (4)

1-Choose the correct answer?

1.Which of the following human activities don't harm a marine ecosystem

a. Throwing plastic products in water. b. Leakage of oil into water
c. Overfishing and damaging of coral reefs d. Recycling of plastic products

2.Habitat restoration projects allow scientists to……. that occur to an ecosystem

a. increase harms b. decrease harms c. keep harms d. Increase damages

3.Removing plants in an ecosystem negatively impacts .

a. water b. sunlight c. primary consumers d. nonliving things

4.The place in which we can take care of small pieces of coral until they grow up is located in

a. seas b. air c. deserts d. forests

5.The area in which the scientists take care of small pieces of coral until they grow up is known as

a. food chain b. food web c. grassland d. nursery

6. All the following processes show coral reefs in healthy conditions, except …… process

a. growing b. bleaching c. reproducing d. filtration

7. " Zero plastics" project that is applied in Egyptian coastal communities that the using of plastic products decreases by…….

a. 0% b. 10% c. 90% d. 100%

2. Put (√) or (x):

1. Removing plants negatively affects consumers in an ecosystem ( )
2. Restoration projects are used to find out solutions for increasing pollution( )
3. It is better to keep natural resources healthy than applying restoration projects on them ( )
4. Citizens must share in returning a habitat back to its healthy condition before harm was done ( )
5. Nursery is the natural habitat in the sea, in which scientist take care of coral until they grow up ( )

3.Write the scientific term of each of the following

1. It is an area in the sea, where scientists take care of small pieces of coral until they grow up (……)
2. A process of returning a habitat back to its natural state before harm was done(……...)

4.Complete the following paragraph using these words

(dying-grow up-bleaching-nursery)

We can protect coral reefs from by transferring corals into ……..in the sea, where scientists take care of corals until they ……. and then moved back to the reefs to continue growing where they were……

5.Give reasons for

.When we remove plants from riverbanks, the foods become more dangerous

……

Unit (2) Particles in motion

Concept 2.1

Matter in world around us

الوحدة الاولي المادة في العالم من حولنا

Lesson(1) Matter

Types of matter.

Activity 1 Matter

Matter: It is anything that has a mass and volume المادة: هي أي شيء له كتلة وحجم

Everything around us is made up of matter. كل شيء من حولنا يتكون من مادة

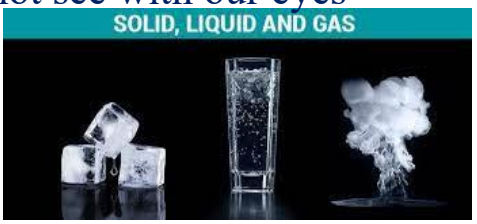
volume it is the space that a matter takes

الحجم هو المساحة التي تأخذها المادة

All things in the world are made up of matter, so it is very import to know the properties of matter. كل الأشياء في العالم مكونة من مادة ، لذلك من المهم جدًا معرفة خصائص المادة

•Any matter is made up of tiny particles that we cannot see with our eyes

أي مادة تتكون من جزيئات صغيرة لا يمكننا رؤيتها بأعيننا ..



Activity 2 3 states of matter

1- Solid state. Such as ice الحالة الصلبة مثل الثلج

2- Liquid state, such as water الحالة السائلة مثل المياه

3- Gaseous state, such as air or water vapor الحالة الغازية مثل الهواء أو بخار الماء

• **Most matter** in three main states

• **matter** can change from one state to another (solids, liquids and gases).

Activity 3

Everything is made up of matter such as: people, trees, mountains, air . and water... etc

كل شيء يتكون من مادة مثل: الناس والأشجار والجبال والهواء والماء ... إلخ

Each matter has its own properties كل مادة لها خصائصها الخاصة

Property: It is a characteristic (or quality) of a matter

الخصائص: هي خاصية (أو جودة) لموضوع ما

Concept 2.1

Exercises on Lesson (1)

1-Choose the correct answer?

1.Matter be can be found in…….. states

a. 2 b. 3 c. 6 d. 7

2.Water can be found in a solid state in the form of….

a. ice b. steam c. sea water d. boiling water

3.An example of a gas is

a. chocolate b. rock c. pencil d. oxygen

4. The amount of space that a matter takes up is called

a. volume b. mass c. weight d. area

5. All of these substances are liquids, except

a. oil b. milk c. stone d. vinegar

6.Both ……and …….have the same state of matter

a. wood-water b. plastic-oil c. wood-milk d. wood-plastic

2. Choose from column (B) what suits it in column (A)

(A)	(B)
1.Carbon dioxide	a. is not a matter
2.Sand	b. is a liquid matter
3.Gasoline	c. is a gas matter
	d. is a solid matter

1…… 2……. 3……

3. Put (√) or (x):

1. Ice is considered the solid state of matter. (…)
2. Matter never changes from one form to another (…)
3. Volume is the space that is taken up by a matter (…)
4.any matter is made of tiny particles (…)
5. All objects can be seen with the naked eye (…)

4.Write the scientific term of each of the following:

1. Anything that has a mass and a volume (……..)
2. The state of water after its freezing (……..)

5.Cross out the odd word

1.Oil-Milk-Water-Wood (……..)
2.Plastic-Vinegar - Iron-Aluminum (……..)
3.Coal-Carbon dioxide-Oxygen-Air (……..)

6.Give reasons for: 1. Salt is a matter

……

7-What happens to …..

The state of water after it is heated in the kettle for few minutes.

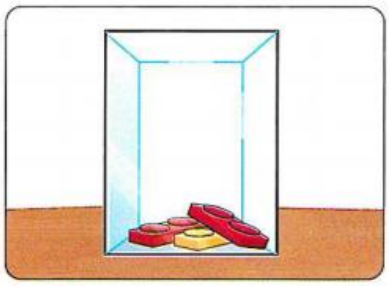
……

Lesson(2) Observing Matter

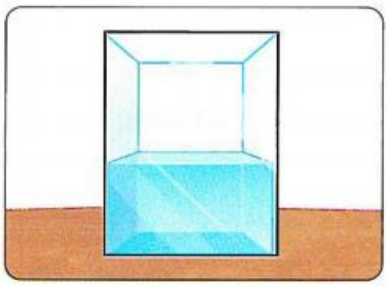
Activity 5 observing Matter

Experiment to show how three s states of matter (solids, liquids and gases).

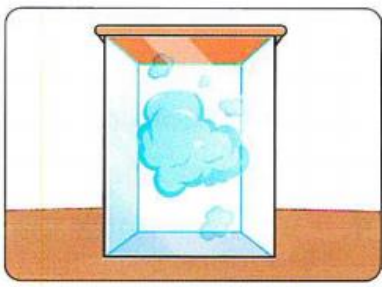
Tools



Container (A)
contains plastic cubes



Container (B)
contains some water



Container (C)
contains steam

Step

Observe the properties of the contents of each container and record your observations in a table.

Observations

Matter	Solid	Liquid	Gas
Shape	Have a definite shape	Have a no definite shape	Have no definite shape
Volume	Have a definite volume	Have definite volume	Have no definite volume
Ex	Plastic cubes in container (A)]	Water (in container (B)]	Steam (in container (C)]

Conclusions

Solids: Have definite (fixed) volume and shape

الصلبة: لها حجم وشكل محدد

Liquids: Have definite volume but they don't have definite shape so, they take the shape of their containers.

المواد السوائل لها حجم محدد ولكن ليس لها شكل محدد ، لذا فهي تأخذ شكل حاوياتها

Gases: Have no definite volume and shape, so they take the volume and shape of the containers.

الغازات: ليس لها حجم وشكل محدد ، لذلك فهي تأخذ حجم وشكل الحاويات.

Note Some gases can't be seen such as air, but:-

بعض الغازات لا يمكن رؤيتها مثل الهواء ولكن

You can see air move when the wind blows and moves some objects.

You can see a balloon gets larger when you blow air into it.

يمكنك رؤية البالون يكبر عندما تنفخ فيه الهواء .يمكنك رؤية الهواء يتحرك عندما تهب الرياح وتحرك بعض الأشياء - :

Activity 4 Matter

Matter

Matter is something that we can

Feel Such as Air

See Such as Ball

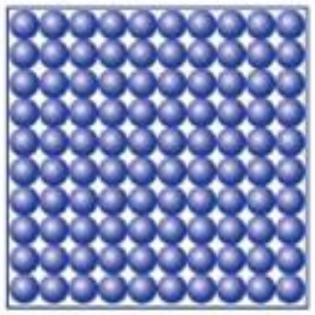
Smell Such as flower

-All matter are made up of very tiny things called particles. Particles of all matter are in continuous motion.

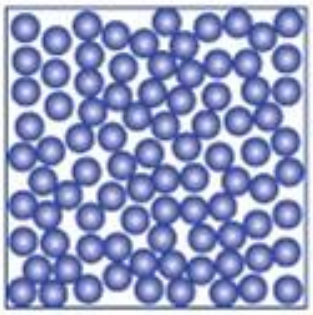
-The following table shows the differences between particles in each state

يوضح الجدول التالي الفروق بين الجسيمات في كل حالة -

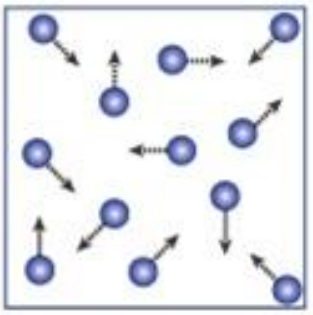
Particles of solid matter	Particles of liquid matter	Particles of gases matter
They are very close to each other (packed tightly) قريبة جدًا من بعضها البعض (معبأة بإحكام) They have less energy. لديهم طاقة أقل They move only a little bit يتحركون قليلا فقط	They have more spaces.لديهم المزيد من المساحات They have more energy لديهم المزيد من الطاقة They can move more freely يمكنهم التحرك بحرية أكبر	They have a lot of spaces لديهم الكثير من المساحات They have a lot of energyلديهم الكثير من الطاقة They move very freely. يتحركون بحرية كبيرة
Shape and volume: • They have definite shape and volume. **Their shape doesn't change** unless something is happening to change them. الشكل والحجم: لهما شكل وحجم محددان. شكلهما لا يتغير إلا إذا حدث شيء يغيرهما	**Shape and volume** They don't have definite shape but they have definite volume. **They take the shape of their containers.** الشكل والحجم ليس لديهم شكل محدد ولكن لديهم حجم محدد. يأخذون شكل حاوياتهم	**Shape and volume:** • They don't have definite shape and volume. **They completely fill their containers and take their shapes.** الشكل والحجم • ليس لديهم شكل وحجم محددين. يملأون أوانيهم بالكامل ويأخذون أشكالهم.



Solid



Liquid

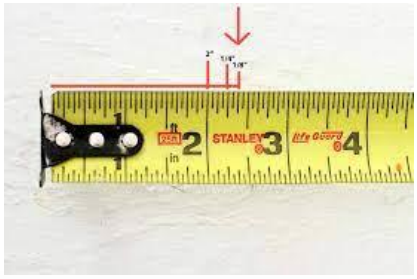


Gas

Measuring and observing matter • قياس ومراقبة المادة

• Some properties of matter can be measured such as:

يمكن قياس بعض خصائص المادة مثل:



1- Ruler (measuring tape (tape measure)

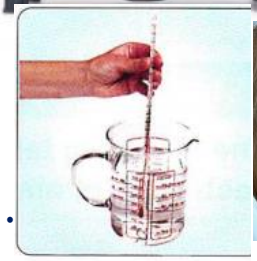
مسطرة - شريط قياس (شريط قياس).

To measure the **length** of some matter

تستخدم لقياس طول بعض المواد

2-Scale ميزان

to measure the **mass** of matter لقياس كتلة المادة



3-Thermometer مقياس الحرارة

We can measure the **temperature** of some matter .

يمكننا قياس درجة حرارة بعض المواد

Thermometer

Notes

1. Matter can change from one state to another state such as:

يمكن أن تتغير المادة من حالة إلى أخرى مثل

Solid (ice)

Melting

Freezing

Liquid (water)

2. There are some things that are not matter such as light and sound which are forms of energy

هناك بعض الأشياء غير المهمة مثل الضوء والصوت وهي من أشكال الطاقة

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Solid	صلب	definite	ثابت
Liquid	سائل	no definite	غير ثابت
Gas	غاز	temperature	درجة حرارة
Ruler	مسطرة	measuring tape	شريط قياس
length	طول	matter	مادة
Scale	ميزان	mass of matter	كتلة المادة
shape doesn't change	شكلهما لا يتغير	packed tightly	مرتبطة بإحكام
have a lot of spaces	لديها مساحة كبيرة	Particles	جزيئات
can't be seen	لا يمكن رؤيتها	blows	تنفخ
container	اناء	another	أخرى

Exercises on Lesson (2)

1-Choose the correct answer?

1. Liquids have definite …….. but their…….. are not definite

a. volume-shape b-color-volume c. shape-volume d. color-shape

2.Both …….. and…….. are solids as they have definite shape and volume

a. wood-oxygen b. milk-iron c. wood-iron d. milk oxygen

3. One of the substances that doesn't take the shape of its container is ……

a. oil b. coin c. gasoline. d. water

4. Both…….. and…….. take the shape of their container

a. air-plastic b. water-air c. Wood-air d. water- plastic

5. Gases have ……..shape and ……..volume

a. definite-definite b. no definite no definite

c. definite-no definite d. no definite-definite

6.Particles of ……are very close to each other

a. gold d. oxygen b. steam c. milk

7. Particles of all the following substances have a lot of energy, except ……

a. water vapor b. carbon dioxide c. oxygen d. rubber

8-The shape of is fixed as it is a matter.

a. gold-liquid b. water-liquid c. air – gas d. gold - solid

9-Oil takes the ……of its container

a. volume b. shape c. color d. mass

10-If we pour an amount of milk from a container to another one that has a different shape, so the shape of milk will…….. and its volume will……..

a. change - change b. not change - not change

c. change - not change d. not change - change

11-To measure the length of a table, we can use a11-

a. thermometer b. balance scale

c. cylinder d. measuring tape.

2. Choose from column (B) what suits it in column (A)

(A)	(B)
1. Milk	a. its particles are packed tightly
2. Air	b. its particles have medium energy
3. Wood	c. its particles move very freely
	d. its particles don't move at all

1…… 2……. 3……

3. Put (√) or (x):

1. All forms of matter have volume.( )
2. Liquids don't take the shape of the container that they are placed in ( )
3. Both gold and milk have definite shape ( )
4. Gases keep their shape and volume whatever the container changes. ( )
5. While transferring water from one pot to another, its volume will change (
6. Particles of water can move more freely than the particles of water vapor ( )

7 . Particles of all matter are in a continuous motion ( )
8-Light and sound are forms of matter ( )
9-Liquid particles move freely more than solid particles ( )
10-Gasoline takes the shape of its container ( )
11-Two equal amounts of sugar and salt cannot take up the same space at the same time ( )

4. Write the scientific term of each of the following

1.The state of matter that has definite volume and shape (……..)
2.The state of matter that is characterized by having a definite volume but it doesn't have a definite shape (……..)
3.Substances that take the shape and the volume of their containers(……..)
4.The state of matter that has a lot of spaces between its particles(……..)
5. The tool used to measure the length of a wall (……..)
6-The tool used to measure the temperature of some matter(……..)

5-Give reasons for

1-Sugar is a solid matter

……

2-Wood has definite shape and volume

……

3-Oxygen has no definite shape or volume

……

4-Particles of a piece of iron are very close to each other

……

5-Water has different shapes when it is placed in some containers that have different shapes

……

6-What happens to

1-The shape of water if we put three equal amounts of water in three different containers

……

2-The volume of a coin if we move it from a cup to another cup

……

3-The shape of water if it changes into ice

……

lesson(3) Particles of Matter

Activity 5 Particles of Matter النشاط 11 جزيئات المادة

Any matter made up of tiny particles that we cannot see with our eyes,
أي مادة مكونة من جزيئات صغيرة لا يمكننا رؤيتها بأعيننا ،

Particles are known as "**the building units of matter**"
"تُعرف الجسيمات باسم "وحدات بناء المادة

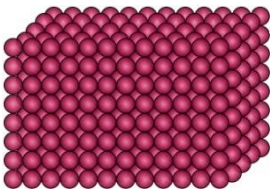
Normal microscopes help us see some particles of matter.
تساعدنا الميكروسكوب العادية في رؤية بعض جسيمات المادة.

different kinds of matter are made of different kinds of particles such as:
أنواع مختلفة من المادة من أنواع مختلفة من الجسيمات مثل

-**Particles** of **gold** are different from particles of iron. تختلف جزيئات الذهب عن جزيئات الحديد

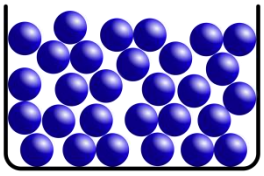
-**Particles** of **water** are different from particles of milk. تختلف جزيئات الماء عن جزيئات اللبن

Particles of solids جسيمات الصلبة



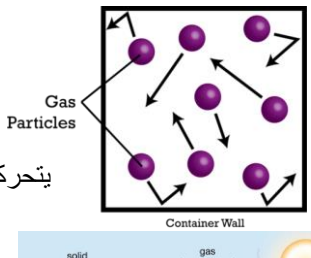
They are packed closely together, so: يتم ارتباطها بشكل قريب معًا ، لذلك
- They vibrate or move around their place. يهتزون أو يتحركون في مكانهم
-They can't move from one place to another and can't slide over each other لا يمكنهم الانتقال من مكان إلى آخر ولا يمكنهم الانزلاق فوق بعضهم البعض
-They keep their shape and volume يحتفظون بشكلهم وحجمهم

Particles of liquids جسيمات السوائل

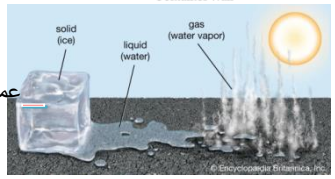


They are held together more loosely, than particles of solids, so:
يتم تماسكها معًا بشكل أكثر مرونة ، من جزيئات المواد الصلبة ، لذلك
-They move faster than solid particles. تتحرك أسرع من الجسيمات الصلبة
- They can slide over each other so, they take the shape of their containers.
يمكنهم الانزلاق فوق بعضهم البعض بحيث يأخذون شكل حاوياتهم.

Particles of gases جسيمات الغازات

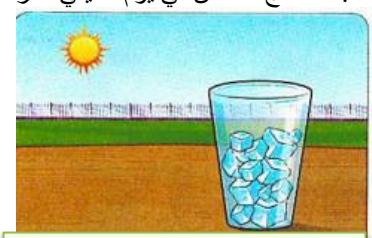


They are not held together, so: لذلك ، لا يتم ارتباطهم معًا :
They move very quickly in all directions. يتحركون بسرعة كبيرة في كل الاتجاهات
They can spread out to fill up any container they put in.
يمكن أن ينتشروا لملء أي وعاء يضعونه فيه .

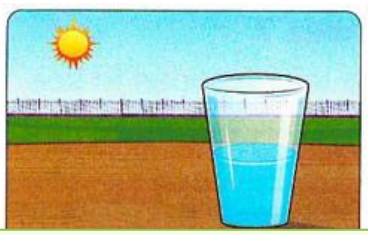


Activity 6 Modeling the Particles of Matter عمل نماذج لجسيمات المادة

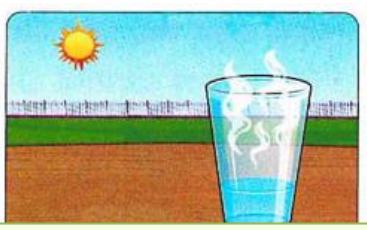
When a cup of ice cubes exposed to the Sun in a hot summer day:
عندما يتعرض كوب من مكعبات الثلج للشمس في يوم صيفي حار:



The Sun will heat up the particles of ice cubes.
ستسخن الشمس جزيئات مكعبات الثلج.



The particles of ice cubes move faster and turned into liquid water
تتحرك جزيئات مكعبات الثلج بشكل أسرع وتتحول إلى ماء سائل



The Sun heats up the particles of water so, they move faster and the water will evaporate
تقوم الشمس بتسخين جزيئات الماء لذلك تتحرك بشكل أسرع وسيتبخر الماء

010051369599/ 01222978682

-Objects that are too small such as germs or too large can studied easily when using models

الأجسام الصغيرة جدًا مثل الجراثيم أو الكبيرة جدًا الدراسة بسهولة عند استخدام النماذج.

Ping pong balls

.To make a model of particles that make up a matter, you can use ping pong balls as they are three-dimensional units and can be separated from each other.

لعمل نموذج للجسيمات التي تشكل مسألة ما ، يمكنك استخدام كرات البينج بونج لأنها وحدات ثلاثية الأبعاد ويمكن فصلها عن بعضها البعض

We can use these balls to describe the movement of particles of the three states of matter.

يمكنك استخدام هذه الكرات لوصف حركة جسيمات حالات المادة الثلاث

Electron microscope

Activity 7 Tiny Particle Size

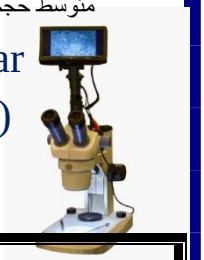
The size of particles depends on. حجم الجسيمات يعتمد على

1. The type of particles نوع الجسيمات
2. How particles connect with each other. كيف تتصل الجسيمات مع بعضها البعض

The average size of a particle is so tiny that **one** of your **hairs** is about 150,000 to 300,000 particles متوسط حجم الجسيمات صغير جدًا لدرجة أن شعرك يتراوح من 150.000 إلى 300.000 جزيء

To see the particles of one blood cell, scientist cannot use the regular microscope, but they use a special microscope (**electron microscope**)

لرؤية جزيئات خلية دم واحدة ، لا يستطيع العلماء استخدام المجهر العادي ، لكنهم يستخدمون مجهرًا خاصًا (مجهر إلكتروني)



► How can we show that particles exist?

When you blow up a balloon عندما تقوم بنفخ بالون	**When you squeeze a balloon** عندما تضغط على بالون
The particles of air inside the balloon move very quickly. تتحرك جزيئات الهواء داخل البالون بسرعة كبيرة The particles of air hit and bounce the balloon from inside تصطدم جزيئات الهواء بالبالون وترتد من الداخل so they produce a force that inflates the balloon and gives it a round shape. ، فتنتج قوة تضخم البالون وتعطيه شكلاً دائريًا .	The particles come close together so the balloon becomes smaller. تقترب الجسيمات من بعضها البعض حتى يصبح البالون أصغر If you squeeze more on the balloon, will pop and the particles of air inside the balloon will escape. إذا ضغطت أكثر على البالون ، فسوف تنفجر وستخرج جزيئات الهواء داخل البالون

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Particles	جزيئات	Normal microscopes	ميكروسكوب عادى
Matter	المادة	electron microscope	إلكتروني ميكروسكوب
inflates	ينتفخ	blow up	بنفخ
germs	الجراثيم	held together	تماسكها معًا
size	حجم	average	متوسط
models	النماذج	force	قوة
turned into	تتحول إلى	depends on.	يعتمد على
squeeze	تضغط	blood cell	خلية دم
average	متوسط	kinds	أنواع

Exercises on Lesson (3)

1-Choose the correct answer?

1. By changing the ……. of a matter, its state may change

a. mass b. volume c. color d. temperature

2.If water is exposed to high temperature, its particles will move……. and the water may change into……..

a faster-ice b. faster-water vapor

c. slower-ice d. slower-water vapor

3.We can use a model to study very large things such as …….

a. solar system b. germs c. microbes d. viruses

4. By blowing up a balloon……..

a. its volume decreases b. its volume increases

c. its color changes. d. its mass doesn't change

5. To examine the structure of tiny particles of a matter, we can use

a microscopes. b. balances c. thermometers d. rulers

6.Particles of ……vibrate around their place

a. glass b. air c. oxygen d. water

7. The movement of particles of water are slower than that of……

a. wood b. plastic c. air d. gold

8.The liquid matter is characterized by all the following, except that ……

a. its particles move faster than solid particles b. its particles move slower than gas particles

c. its particles can't spread to fill up any container they put in

d. its particles are held together more closely than solid

3. Put (√) or (x):

1.Germs are very large organisms that can be seen with the naked eye ( )

2. Ping pong balls can be used to make a model of particles as they are three-dimensional units ( )

3. Air particles are visible as they are very large particles ( )

4. To see components of one particle such as a blood cell, we can use the regular microscope ( )

5. By squeezing a balloon, you decrease the space that the gas particles can occupy ( )

6.The type of particles affects their size ( )

7.Liquid particles move freely more than solid particles. ( )

8. Some particles of matter can be examined by regular microscopes. ( )

9. The speed of water vapor particles is slower than that of water particles ( )

10. Particles of wood are different from particles of plastic ( )

3. Complete the following sentences using words below

(quickly - normal - particles - high)

1-Water evaporates when it is exposed to temperature .

2-Scientists cannot use the blood cell. microscope to see the components of one

3-Building units of a matter are known as

4-The particles of air inside the balloon move very

4. Write the scientific term of each of the following

1. The state of water after its heating for high temperatures.(…….)
2. A device used to examine one tiny particle such as a blood cell. .(…….)
3. A device used to examine objects that are too small to be seen with the naked eye (…….)

5- Give reasons for:

1. Using models to study some scientific concepts

……

2. Sometimes we need to use an electron microscope.

……

3. Particles of gases can spread out quickly to fill up any container they are put in.

……

4. Liquids take the shape of their containers.

……

6 What happens if...

1. The speed of particles of an ice cube when it is exposed to the Sun .

……

2.The size of a balloon when you blow it up

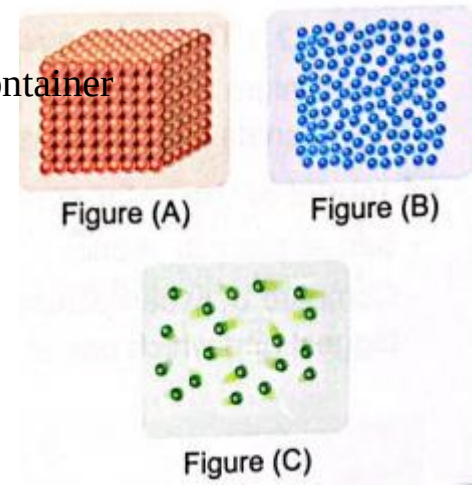
……

3. The speed of particles of liquid when it change into gas

……

7. Look at the opposite figures that represent the three states of matter, then complete the following sentences:

1. Matter in figure ..... takes the shape of its container but its volume doesn't change.
2. Particles of figure..... move faster than that of figure..... and figure…….
3. Particles of figure..... are not held together



Models

Activity 8 Models نماذج

Model: It is a copy that is similar to a real thing.

النموذج: هو نسخة مشابهة لشيء حقيقي

Models help us understand things we cannot easily see such –

تساعدنا النماذج على فهم الأشياء التي لا يمكننا رؤيتها بسهولة

Models may be drawings, objects or ideas that represent a real event, object or process النماذج عبارة عن رسومات أو أشياء أو أفكار تمثل حدثًا حقيقيًا أو مادة أو عملية

- Models look like, move like or work like what they copy.

النماذج تبدو وكأنها تتحرك أو تعمل مثل ما تنسخه قد تكون.

How do models help us look at big things? كيف تساعدنا النماذج في النظر إلى الأشياء الكبيرة؟

• Models can represent very big things in a smaller size, because it is hard to see them • يمكن أن تمثل النماذج أشياء كبيرة جدًا بحجم أصغر ، لأنه من الصعب رؤيتها

Globe

Example 1: The Earth:

A globe represents a model of the Earth which shows us

تمثل الكرة الأرضية نموذجًا للأرض يوضح لنا

-The shape of the Earth. شكل الأرض

- How much of the Earth is covered with water كم من الأرض مغطاة بالماء.

- Where different countries are located. اين توجد مختلف الدول

Model of solar system

Example 2: The solar system:

Solar system is a very big place, planets and the Earth are very big objects.

المجموعة الشمسية مكان كبير جدًا ، والكواكب والأرض أجسام كبيرة جدًا

A model of the solar system helps us: يساعدنا نموذج المجموعة الشمسية على

- See all planets at once. شاهد جميع الكواكب في وقت واحد

- Compare between planets which one is biggest and which one is closest to the Earth. قارن بين الكواكب الأكبر والأقرب إلى الأرض

How do models help us look at small things كيف تساعدنا النماذج في النظر إلى الأشياء الصغيرة

Models can represent very tiny things in a bigger size, because it is hard to see them such as germs.

يمكن أن تمثل النماذج أشياء صغيرة جدًا بحجم أكبر ، لأنه من الصعب رؤيتها مثل الجراثيم.

Germs are spread around us which make us sick and we can only see them with a microscope.

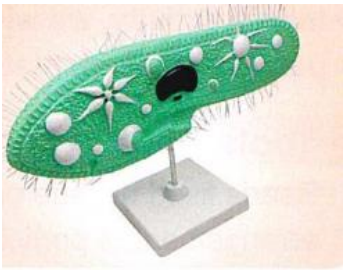
تنتشر الجراثيم حولنا مما يجعلنا نمرض ولا يمكننا رؤيتها إلا بالمجهر.

A model of a germ helps us See the shape of a germ without microscope

نموذج الجرثومة يساعدنا رؤية شكل جرثومة بدون مجهر

See different parts of germs which help to spread from one person to another

رؤية أجزاء مختلفة من الجراثيم التي تساعد على الانتشار من شخص إلى آخر



Model of a germ

Models help us understand how things werk

Example1 A model of a volcano نموذج البركان

A model of a volcano shows us يظهر لنا نموذج البركان

The shape of a volcano How the liquid that comes out of a volcano during a real eruption

شكل البركان كيف يخرج السائل من البركان أثناء ثوران بركاني حقيقي

Example 2 A model of an airplane نموذج لطائرة

A model of an airplane shows us how it flies up into the air.

يوضح لنا نموذج لطائرة كيف تطير في الهواء.

models help us Teach something about the real things they copy

النماذج تساعدنا في تعليم شيء ما عن الأشياء الحقيقية التي تنسخها

See and understand how things work انظر وافهم كيف تعمل الأشياء

Learn about many things at just the right size تعرف على أشياء كثيرة بالحجم المناسب

Know what we could not otherwise see تعرف على ما لم نتمكن تعرف على ما لم نتمكن من رؤيته

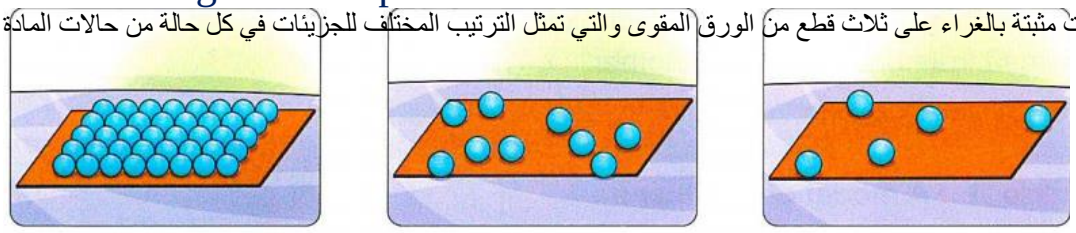
Activity 15 Modeling States In this activity,

We will observe three models that show the arrangement of Matter particles in each state of matter. (solids, liquids and gases)

سنلاحظ ثلاثة نماذج توضح ترتيب جسيمات المادة في كل حالة من حالات المادة. (المواد الصلبة والسوائل والغازات)

Tools Beads fixed by glue on three pieces of cardboard which represent the differ arrangement of particles in each state of matter

حبات مثبتة بالغراء على ثلاث قطع من الورق المقوى والتي تمثل الترتيب المختلف للجزيئات في كل حالة من حالات المادة



Model of a solid Model of a liquid Model of a gas

Step Observe the three models of three states of matter and write the arrangement of particles in each state .

Observations The arrangement of beads in: ملاحظات ترتيب الخرز في

- **Solid model**: Beads are arranged in a regular pattern. النموذج المصمت: الخرز مرتبة بنمط منتظم

- **Liquid model**: Beads are little far from each other and not arranged in a pattern.

النموذج السائل: تكون الخرزات بعيدة قليلاً عن بعضها البعض وليست مرتبة في نمط

- **Gas model**: Beads are so far from each other and not arranged in a pattern.

نموذج الغاز: تكون الخرزات بعيدة جدًا عن بعضها البعض وغير مرتبة في نمط.

Conclusions The arrangement of particles in: ترتيب الجسيمات في

- **Solid matter**: They have a regular pattern (organized).

المادة الصلبة: لها نمط منتظم (منظم)

- **Liquid matter**: They have a random arrangement (not well organized

المادة السائلة: لها ترتيب عشوائي ((غير منظم على الإطلاق

Gas matter: They have a random arrangement (not organized at all).

مادة غازية: غير منظمة جيدًا: لها ترتيب عشوائي

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
represent	تمثل	Models	نماذج
arrangement	ترتيب	airplane	طائرة
different	مختلفة	volcano	بركان
spread	انتشار	process	عملية
person	شخص	around us	حولنا
real	حقيقي	comes out	يخرج
during	أثناء	Beads	خرز
pattern.	نمط	random	عشوائي
fixed	مثبتة		

Exercises on Lesson (4)

1-Choose the correct answer?

1. The model of the Earth shows how much of its surface is covered with…….

a. gasoline b. water. c. milk d. animal

2. We can see all planets of the……. system including the Earth by using a model

a. solar b. digestive c. respiratory d. muscular

3. Some liquids come out of a ……during its eruption

a. star b. wooden piece c. volcano d. plastic pies

4. Particles of ……are organized and have a regular pattern

a. solids only b. gases only

c. solids and liquids d. liquids and gases

5. Gases differ from solids and liquids in that gases

a. can be poured b. fill any container they are put in

c. have a definite shape d. have a definite volume

2. Put (√) or (x):

1. Models don't help us understand things that we cannot easily see with our eyes ( )
2. Solar system contains only one planet which is the Earth ( )
3. Models help us understand ideas, objects or processes ( )
4. We can see the shape of a germ by using a special microscope ( )
5. Most germs can spread through the air from a person to another ( )
5. A model of an airplane shows us how it flies up into the air ( )

3.Write the scientific term of each of the following

1. A model of the whole world that is made in the shape of a large ball (…….....)
2. A copy that is similar to a real thing which we cannot observe with our eyes (…….....)

4.Complete the following sentences

1. Water vapor particles are loosely packed, so that water vapor don't have a definite ……or ……
2. The Earth is a planet in the……..system
3. We can study the location of countries by using a……. which represent a model of the Earth
4. A model of a germ helps us to see its shape without using a …… which is used to magnify tiny objects
5. Liquids that come out of a volcano have definite……..but they have no definite……

5. Give a reason for the following:

Scientists made a model of germs

……

6. What happens to ...?

The arrangement of particles of water after its freezing.

……

Careers and States of Matter

Activity 18 Careers and States of Matter وظائف وحالات المادة

We use the three states of matter to prepare and cook different types of food such as:

solid matter	liquid matter	gases matter
-Rice أرز Pasta مكرونة Frozen vegetables خضروات مجمدة	Water مياه Oil. زيت Vinegar الخل	Natural gas used in gas ovens الغاز الطبيعي المستخدم في أفران الغاز Steam of boiling water. بخار الماء المغلي

Scientist chef شيف عالم

- Chefs use science during preparing dishes. يستخدم الطهاة العلم أثناء تحضير الأطباق
- Chefs use different states of matter to change ingredients such as:

يستخدم الطهاة حالات مختلفة لتغيير المكونات مثل

1. Boiling some water to cook pasta or rice. Where liquid water changes into steam which is a gas matter.

غلي بعض الماء لطهي المكرونة أو الأرز حيث يتحول الماء السائل إلى بخار وهو مادة غازية .

2. Freezing vegetables keep them fresh and ready to use for longer periods of time.

تجميد الخضار يبقيها طازجة وجاهزة للاستخدام لفترات زمنية أطول

3. Leave a cup of juice or milk in freezer to change from liquid state into solid state.

اترك كوبًا من العصير أو الحليب في الفريزر ليتحول من الحالة السائلة إلى الحالة الصلبة

Points of comparisons	Particles of solid matter	Particles of liquid matter	Particles of gases matter
Spaces between particles	They are very close together so, solid objects are hard.	They have more spaces but still (held) close together	They have a lot of spaces (are not held together).
Energy of particles	They have more energy.	They have less energy.	They have a lot of energy.
Movement of particles	They vibrate - move around their place	They move faster than solid particles.	They move very freely and quickly in all directions.
Spreading of particles:	They can't move from one place to another & can't slide	They can slide over each other so, they take the shape of their containers.	They can spread out to fill up any container they put in
Arrangement of particles	They are arranged in a regular pattern (organized).	They have a random arrangement (not well organized).	They have a random arrangement (not organized at all).
Shape	They have a definite (fixed) shape.	They don't have definite shape.	They don't have definite shape.

Exercises on Lesson (5)

1-Choose the correct answer?

1. When we keep water inside the freezer, the state of water changes from..... into .....

a. liquid-gas b. liquid-solid c. solid-liquid. d. gas-liquid

2. All the following are liquid matter that are used in preparing food, except .

a. water. b. vinegar c. oil d. rice

3.You can see..... different states of matter in this picture

a. two b. three c. four d. five

4. .....and..... are examples of solids

a. chair-ice b. juice - ice c. ruler – steam d. bottle - milk

2. Put (√) or (x):

1. Frozen vegetables and vinegar have definite shape ( )
2. Steam of boiling water is considered the gas state of water ( )
3. Natural gas used in gas oven has no definite shape or volume ( )

3.Complete the following sentences using words below

(solid-liquid - gas -space - containers - particles)

1.The state of matter that has a definite volume, but it doesn't have a definite shape is .....

2. Volume is the amount of..... that matter takes up
3. We can classify the types of matter into liquid,.....and .....
4. Matter is made up of tiny.....
5. Liquids take the shape of their.....

4. Give a reason for the following

Oil used in cooking is considered as an example of liquid matter.

.....

5. What happens to ...?

.The state of milk if we put small amount of it in the freezer for few hours

.....

Concept (2.2)

Describing and Measuring Matter

Lesson(1) Careers and States of Matter

Activity 2 A Roof for Every Type of Climate سقف لكل نوع من أنواع المناخ

in this activity we will know some kinds of materials which people use to make roofs of homes and buildings

في هذا النشاط سوف نتعرف على بعض أنواع المواد التي يستخدمها الناس لصنع أسطح المنازل والمباني..

	Material of the roof	Properties of roof material
Desert Home بيت الصحراء 	Made of strong stones مصنوع من حجارة قوية.	It is flat إنه مسطح . -It protects the home from dust and dirt.. – يحمي المنزل من الغبار والأوساخ
Cold weather Home  منزل للطقس البارد	Made of ceramic tiles (ceramic bricks) مصنوع من بلاط السيراميك (طوب السيراميك	-It is slanted (inclined) مائل (مائل) it protects the home from rains يحمي المنزل من الأمطار ..
Tropical Rainforest Home  منزل للغابات الاستوائية المطيرة	Made of مصنوع من Leaves and sticks. الأوراق والعصي .	It is slanted (inclined) مائل (مائل) It protects the home from animals getting inside. يحمي المنزل من دخول الحيوانات للداخل

Note The kind of material used to make a roof depends on the climate where the home is located ملاحظة يعتمد نوع المواد المستخدمة في صنع السقف على المناخ الذي يقع فيه المنزل

3 Activity What Do you Already know About Describing and Measuring Matter

Matter can be described by its color, shape odor, texture and size

Measuring matter

Each property of matter can be measured using a special measuring tool

Tape Measure شريط قياس	Ruler مسطرة	Balance (Scale) ميزان (مقياس)	Measuring Cup كأس قياس	Thermometer ترمومتر
				
Used to measure **Length**		Used to measure **Mass**	Used to measure **Volume**	Used to measure **Temperature**

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Tape Measure	شريط قياس	Balance (Scale)	ميزان (مقياس)
Ruler	مسطرة	Measuring Cup	كأس قياس
Thermometer	ترمومتر	Temperature	درجة الحرارة
Mass	الكتلة	measure	القياس
Length	الطول	Volume	الحجم
Tropical Rainforest	للغابات الاستوائية المطيرة	Cold weather	للطقس البارد
ceramic tiles	بلاط السيراميك	ceramic bricks	طوب السيراميك
Leaves	الأوراق	Protect	يحمي
sticks	العصي	dirt	والأوساخ
roof	السقف	dust	الغبار

Exercises on Lesson (1)

1-Choose the correct answer?

1. Homes which are built in a cold weather area have roofs made up of…….

a. ceramic tiles b. strong stones. c. carton paper d. leaves and sticks

2. Roofs of are made up of strong stones

a. desert homes only
b. cold weather homes only
c. desert homes and cold weather homes
d. desert homes and tropical rainforest homes

3. Which of the following homes have an inclined roofs?

a. Desert homes only
b. Tropical rainforest homes only
c. Desert homes and cold weather homes
d. Tropical rainforest homes and cold weather homes.

4. You can measure the length of your friend by using a ……

a. thermometer b. ruler c. measuring cup d. balance .

5.We can measure ……of a liquid by using measuring cup .

a. length b. volume c. mass d. temperature

6.You can measure the length of your friend by using

a. thermometer b. tape measure c. balance d. measuring cup

7.All the following can be used to describe matter except …….

a. shape b. price c. color d. texture

8. We can identify milk by determining its

a. color and texture b. shape and odor c. color and size d. color and taste

2.Choose from column (B) what suits it in column (A)

Column (A)	Column (B)
1.Thermometer	a. is used to determine the length of a book
2.Ruler	b. is used to determine the mass of some apples
3.Measuring cup	c. is used to determine the temperature of a hot cup of tea
4.Balance	d. is used to determine the volume of an amount of water
	e. is used to determine the shape book

1. …….. 2. …….. 3…… 4…….

3. Put (√) or (x): .

1.We can describe a solid matter by its color and shape.( )
2. The roof of tropical rainforest home is made up of leaves and sticks.( )
3.The roof of desert home is made up of strong stories to protect it from snow.( )
4. We can measure the volume of an amount of oil by using tape measure.( )
5. The length of the classroom wall is measured by using a balance ( )
6.You can use thermometer to measure the temperature of a hot cup of water .( )
7.We can differentiate between sugar and salt by using their color ( )

4. Write the scientific term of each of the following

1.A material that is used to build the roofs of cold weather homes (……..)

2. A material that is used to build the roofs of desert homes. (……..)
3. The property of matter which is measured by the measuring cup (……..)
4. The property of matter which is measured by the balance (……..)
5.The property of matter which is measured by the tape measure (……..)

5.Give reasons for

1. The roof of desert home is made of strong stones

……

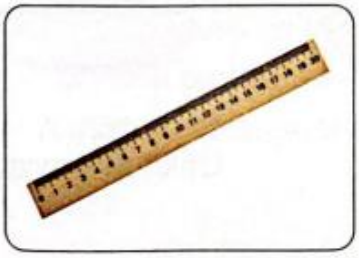
2.The roof of tropical rainforest home is made of leaves and sticks

……

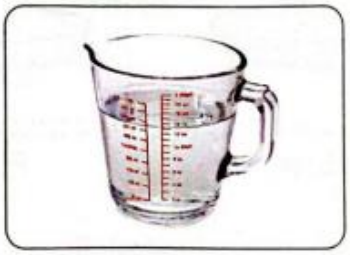
6.What happens if

The roofs of cold weather homes is flat

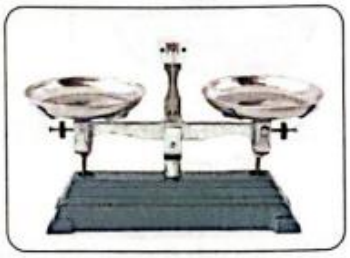
7.Choose the suitable tool to measure some things found at your 8 :classroom (you can choose the same tool more than once)



Tool (A)



Tool (B)



Tool (C)

1.You can measure the height of your chair by using tool(…….)
2.You can measure the mass of your copybook by using tool(…….)
3.You can measure the volume of the water that is found in your bottle by using tool(…….)
4.You can measure the length of your pencil case by using tool(…….)

▸ Put each of the following tools in front of its suitable sentence :

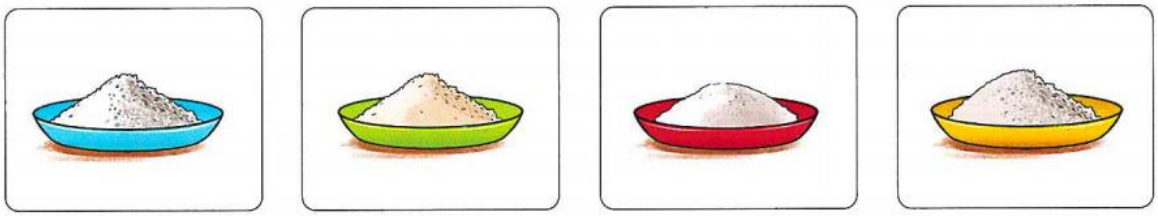
(Measuring cup – Thermometer – Ruler – Balance)

1. A tool is used to measure the mass of materials. (……)
2. A tool is used to measure the temperature of materials. (……)
3. A tool is used to measure the volume of materials. (……)
4. A tool is used to measure the length of materials. (……)

Lesson (2) The Case of the Kitchen Mystery

Activity 4 The Case of the Kitchen Mystery قضية المطبخ الغامض

Tools:



• Spoons • Hand lenses • Piece of black construction paper

الأدوات: • 20 جم ملح • 20 جم سكر • 20 جم من مادة غير معروفة • 20 جم بيكنج بودر
(اختياري) عدسات اليد • قطعة من الورق المقوى الأسود • جرام طحين. • ملاعق 20 •

Steps:

1. Check (examine) the four plates in front of you and touch all the substances with your hand to feel their textures.

1. افحص (افحص) اللوحات الأربع أمامك والمس جميع المواد بيدك لتشعر بقوامها.

2. Smell all the substances and know the odor of all of them.

2. شم جميع المواد وتعرف على رائحتها كلها.

3. Use the lens to observe the shape of crystals of each substance.

3. استخدم العدسة لملاحظة شكل بلورات كل مادة

Observations

All substances have the same color جميع المواد لها نفس اللون

Some substances have different odors. بعض المواد لها روائح مختلفة

Some substances hove different texture, as the shape of the crystal varies.

تحتوي بعض المواد على نسيج مختلف ، حيث يختلف شكل البلورة

Sugar has large crystals يحتوي السكر على بلورات كبيرة

Salt hos small crystals ملح بلورات صغيرة

Flour has fine particles الدقيق له جزيئات دقيقة

A mixture of large crystals and very fine particles as in the unknown mixture

خليط من بلورات كبيرة وجزيئات دقيقة جدًا كما هو الحال في الخليط غير المعروف

Conclusion:

Color, shape, odor, and texture are some of the physical properties of matter that help us describe matter

اللون والشكل والرائحة والملس من الخواص الفيزيائية التي تساعدنا على وصف المادة

Exercises on Lesson (2)

1-Choose the correct answer?

1. ……has large sized crystals, while..... has small sized crystals

a. Salt-sugar b. Salt – flour c. Sugar-flour d. Sugar-salt

2-Which of the following properties is/are considered as physical properties of matter

a. Color only b. Shape only

c. Color and odor only d. Color, shape and odor

3-We can differentiate between vinegar and perfume by using the sense of

a. touch b. sight c. smell d. hearing

4-We can differentiate between salt and flour through all the following properties, except the

a. shape of particles b. texture of particles c. taste d. color

5.We can differentiate between all the following matter as they have different colors, except

a. salt and flour. B. salt and pepper

c. milk and oil d. flour and pepper

2. Put (√) or (x):

1.Salt and sugar have the same color and odor ( )

2. You can use the lens to identify the odor of sugar ( )

3. Among physical properties of matter are shape and texture.( )

4.We can differentiate between sugar and flour by texture only ( )

5. Color of milk is considered as one of its physical properties . ( )

6.You can differentiate between the components of salt and flour mixture by using your sight sense only. ( )

3. Complete the following sentences by using the words below

(odor-smaller-physical-color)

1.The taste of apple is from.....properties of apple

2-Salt and sugar are similar in

3.You can identify the..... of a juice by using the sense of smell

4.The crystals of salt is ……than that of sugar

4.Give a reason for the following

You can use the sense of sight only to differentiate between salt and pepper

……

Lesson(3)

Properties of Matter

Activity 6 Properties of Matter خصائص المادة

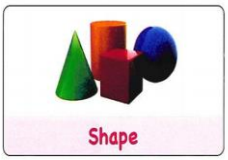
Matter has many properties that you can describe المادة لها العديد من الخصائص التي يمكنك وصفها
- Some of these properties can be observed by our five senses.
يمكن ملاحظة بعض هذه الخصائص من خلال حواسنا الخمس

Properties of Matter can be classified into. يمكن تصنيف خصائص أي مادة إلى

Physical Properties الخصائص الفيزيائية	Chemical Properties الخواص الكيميائية
1. You can observe the physical properties with your five senses. يمكنك مراقبة الخصائص الفيزيائية بحواسك الخمس. 2. You can use words such as rough, blue, round and sweet to describe the physical properties. . يمكنك استخدام كلمات مثل خشن ، أزرق ، دائري ، حلو لوصف الخصائص الفيزيائية	Chemical properties of a material can be observed and measured by the changes that happen in this material when it interacts with other materials. يمكن ملاحظة الخواص الكيميائية للمادة وقياسها بالتغييرات التي تحدث في هذه المادة عندما تتفاعل مع مواد أخرى

Examples
1- Color 2- Shape 3
3- Odor 4-Texture
1- اللون 2- الشكل 3- الرائحة 4- الملمس

►The ability to burn: القدرة على الاحتراق
Such as when a paper interacts with fire, the paper becomes ash. عندما يشتعل الورق يتحول إلى رماد :
►The ability to rust: القدرة على الصدأ
Such as when an iron nail interacts with water and air, the iron nail rusts.
كما هو الحال عندما يتفاعل مسمار حديدي مع الماء والهواء ، يصدأ مسمار الحديد




Volume and Mass

Volume الحجم	Mass الكتلة
is the amount of space that matter takes up مقدار الحيز الذي يشغلة الجسم من الفراغ .	is the amount of matter that object contains هو مقدار المادة التي يحتوي عليها هذا الجسم
Measuring units 1-Litter (L) 2-Milliliters (mL) 3-Cubic centimeters (cm3) (1L =1000 mL =1,000 cm³).	**Measuring units** 1-Grams (g) 2-Kilograms (Kg) (1 kg=1,000 g) One liter of water a mass of 1 kilogram


Temperature

Temperature is a measure of how quickly the particles in a matter are moving

درجة الحرارة هي مقياس لمدى سرعة تحرك الجسيمات في مادة ما

Quickly moving particles produce more heat energy than slower moving particles

الجسيمات المتحركة بسرعة تنتج طاقة حرارية أكثر من الجسيمات التي تتحرك ببطء

Volume, mass and temperature are properties of matter that you can measure

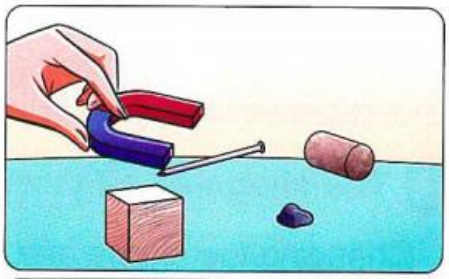
الحجم والكتلة ودرجة الحرارة هي خصائص للمادة التي يمكنك قياسها

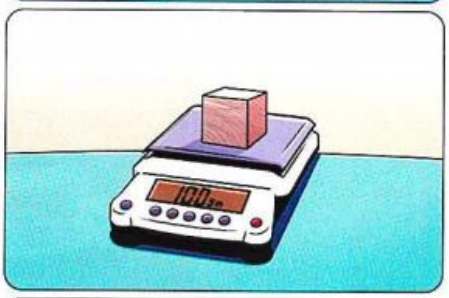
Activity 6 Measuring Properties

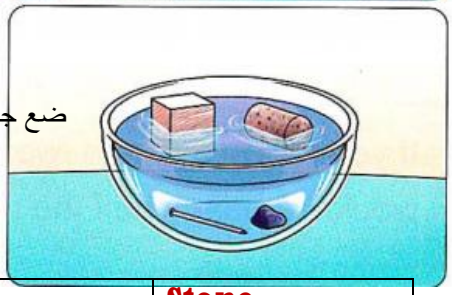
Experiment

• The properties of matter and how to describe and measure it. In this activity we will measure different physical properties of matter.

Tools Basin containing water-Magnet-Balance - Stone Iron nail-Piece of wood - Piece of cork







Steps

1. Hold the magnet near to each of the previous substances, and observe what substances are attracted to the magnet.

أمسك المغناطيس بالقرب من كل مادة من المواد السابقة ، ولاحظ المواد التي تنجذب إلى المغناطيس

2. Measure the mass of each substance by using the balance.

قس كتلة كل مادة باستخدام الميزان

3. Put all substances in the basin that contains water to observe which materials will float and which will sink.

ضع جميع المواد في الحوض الذي يحتوي على الماء لملاحظة المواد التي ستطفو وأيها ستغرق

4. Record your results in the following table.

سجل نتائجك في الجدول التالي ..

Observations:

Property	Wooden Block	Iron Nail	Cork	Stone
Attracted to the Magnet or Not	Not attracted	attracted	Not attracted	Not attracted
2 -Sink or Float	Float	Sink	Float	Sink
3- Mass	80 gm	20 gm	40 gm	70 gm

Conclusion: Some substances are attracted to magnets and some other materials aren't attracted to magnets.

تنجذب بعض المواد إلى المغناطيس ولا تنجذب بعض المواد الأخرى إلى المغناطيس.

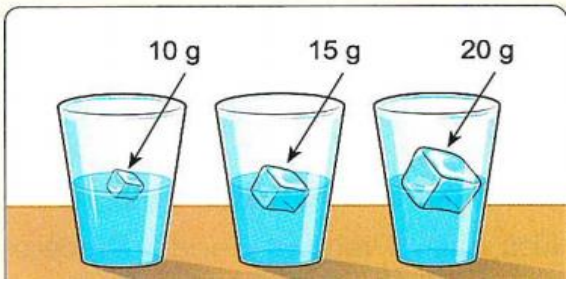
Some substances float on water and some other sink in water

تطفو بعض المواد على الماء وتغوص بعض الأخرى في الماء

Ice is lighter than water so, ice floats on the water surface.

Example :

The opposite figures show three ice cubes with different masses (10 g - 15 g - 20 g), all ice cubes float on the surface of water because ice is lighter than water.



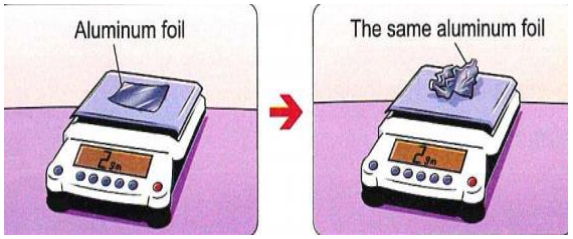
Does the change in the shape and size affect the object's mass?

هل يؤثر التغيير في الشكل والحجم على كتلة الجسم؟

1-The shape of material

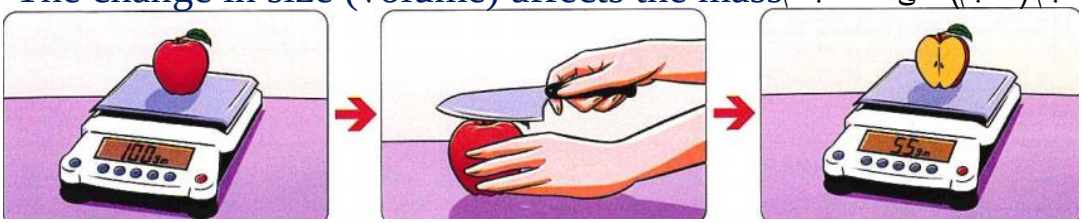
The change in shape doesn't affect the mass

التغيير في الشكل لا يؤثر على كتلة الجسم



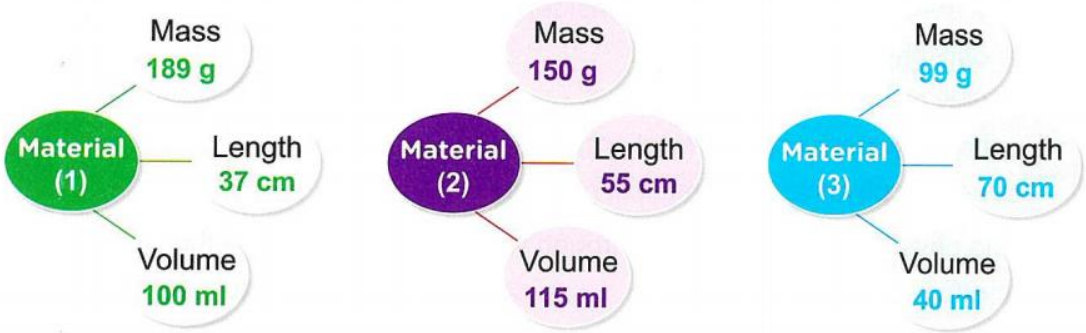
1-The size of material

- The change in size (volume) affects the mass يؤثر التغيير في الحجم (الحجم) على كتلة الجسم



Activity 7 Measuring Matter

In front of you three materials, observe the data of each of them to compare between their properties



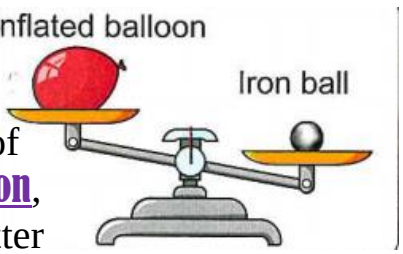
Based on the previous data we can conclude that

Material (1) has the biggest mass although it doesn't have the largest volume. **Material (2)** has the largest volume although it doesn't have the biggest mass

Material (2) is the longest one.

Note ملاحظة

Although an **inflated balloon** takes larger volume than that of an **iron ball**, it has **bigger mass than that of the inflated balloon**, this is due to that the iron ball contains more amount of matter than the balloon،



على الرغم من أن البالون المنفوخ يأخذ حجمًا أكبر من حجم الكرة الحديدية ، إلا أنه يحتوي على كتلة أكبر من كتلة البالون المنفوخ ، ويرجع ذلك إلى أن الكرة الحديدية تحتوي على كمية من المادة أكبر من البالون

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
Physical	الفيزيائية	Chemical	الكيميائية
Wooden	خشبى	Cork	فلين
Iron Nail	مسمار حديد	Stone	حجر
previous	السابقة	substances	المواد
Temperature	درجة الحرارة	Properties	الخواص
Measuring units	وحدة قياس	change in shape	التغيير في الشكل
ability to rust	القدرة على الصدأ	ability to burn	القدرة على الاحتراق
float	تطفو	sink	تغوص
ash	رماد	results	نتائجك
Record	سجل	Although	بالرغم من

Exercises on Lesson (3)

1-Choose the correct answer?

1. When the iron interacts with water and air, it……

a. becomes ash b becomes powder c. burns d. rusts

2. Burning of wood is considered as ……..of matter

a. only physical property b. only chemical property

c. both physical and chemical properties

d. neither physical nor chemical properties

3.The physical property of milk through which you can see it is the ……. of it

a. odor b. texture c. color d. taste

4.All the following are physical properties of matter except ……..

a. color b. rusting c. texture d. shape

5.We can measure the volume of a liquid by all the following units except …….

a. kilogram b. milliliters c. cubic centimeters d. liters

6.The volume of one liter of water has a mass of …….

a. one gram b. one kilogram c. one milliliter d. one cubic centimeter

7. The volume of 1000 cubic centimeters of a liquid is equal the same volume of …

a. 1 kilogram b. 1 gram c. 1 centimeter d. 1 liter

8.When particles of matter move quickly they produce more ……..energy

a. thermal b. light c. sound d. solar

9. All the following properties of matter can be measured the different tools except

a. mass b. volume c. color d. temperature

10-Which of the following matter is attracted to the magnet ?

a. Ice cube b. Paper clip c. Woody spoon. d. Plastic ruler

11. Which of the following matter floats on the surface of water

a Iron spoon b. Piece of stone c. Iron nail d. Piece of cork

12. Which of the following matter sinks and not attracts to the magnet

a. Wood cube b. Iron nail c. A piece stone d. Plastic cup

13-If you fold a piece of paper, its ……will not change

a. mass and color b. color and shape

c. mass and shape d. color and size

14.If we cut a tomato into two halves, the ……of one half of tomato will decrease to half

a. color b. mass c. temperature d. shape

15. one kilogram of tomato is differ from one kilogram of wood in the

a, volume only b. mass only d. color and mass c. volume and mass

2. Put (√) or (x): .

1.Shape is one of chemical properties of matter

2.All physical properties of matter can be measured

3.If the masses of two different materials are equal, so their volume must be equal ( )

4.Ability of fuel to burn is considered from chemical properties of fuel ( )

5.When we put an iron nail in water and then leave it in air, it will rust ( )

6.The temperature increases by increasing the speed of moving particles of a matter ( )

7. Iron spoon is attracted to the magnet ( )

8. Iron nail is attracted to the magnet and floats on the surface of water ( )
9. If we put a wood cube in water it will float. ( )
10. If we cut an apple into 4 pieces, the mass of each piece is less than the mass of whole apple ( )
11 .1 kilogram of water has a volume equals 1000 milliliters. ( )
12. The mass of iron bar its volume equals 50 cm^3 is differ from mass of wood bar has the same volume ( )

3.Write the scientific term of each of the following:

1. The properties of matter which you can observe them by using your five senses (……)
2. The properties of matter which can be observed and measured by the changes that happen when the material interacts with other materials(……)
3.It is the amount of space that matter takes up (……)
4.It is a measure of the amount of matter (……)
5.It is a measure of how quickly the particles in a matter are moving(……)

4. Complete the following sentences by using the words below

(one thousand-chemical-temperature-volume-physical-rough- mass-iron-attracted - doesn't attract-cotton-floats - sinks)

1-Both of odor and texture of matter are considered from the ……..properties of matter
2. The ability of a piece of iron to rust is from the ……..properties of matter
3. By decreasing the speed of particles of a matter its ……will decrease
4. We can describe the texture of sugar crystals by saying "it has ……crystal texture
5.A spoon of wood to the magnet and..... on the surface of water
6.An iron ruler..... in water, and…… to the magnet
7. The volume of 1 liter of water has a..... of 1 kilogram
8. The mass of 1 kilogram of apple equals the mass ……pieces of paper clip
9-If you eat a small piece from a banana, so the ……of the remaining piece of banana will decrease
10-If an iron cube and an amount of cotton have the same mass, so the volume of ……is smaller than that of the……..

5. Give reasons for:

1. Rusting of iron is considered from chemical properties of matter

……

2. When the particles of a matter move quickly, its temperature increases.

……

6.What happens if...?

1. A piece of paper interact with fire.

……

2. The speed of particles of a matter decreases. (according to its temperature

……

3.An iron nail and a plastic spoon if they are put close to a magnet.

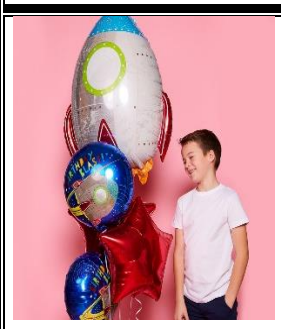
……

4. A piece of cork is put in water .

……

Useful Properties of matter

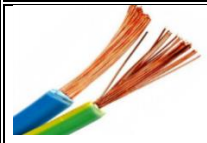
Activity 11 Useful Properties of matter

Helium	Properties	Uses
	**Physical properties** خواص فيزيائية -Helium gas is lighter than air غاز الهليوم أخف من الهواء -Helium is safe to use because الهليوم آمن للاستخدام لأنه **Chemical properties** خواص كيميائية 1- It is not poisonous ليست سامة 2- It is not flammable إنه غير قابل للاشتعال	1- is used to fill balloons يستخدم لملء البالونات 2 -is used to fill blimps يستخدم لملء المناطيد 

A flammable material is easily burned when it is set on fire.
مادة قابلة للاشتعال يتم حرق بسهولة عند إشعال النار فيها

Give reason for :

Balloons and blimps filled with helium always rise up in the air.
دائمًا ما ترتفع البالونات والمناطيد المملوءة بالهيليوم في الهواء.
Because the helium is lighter than air.لأن الهيليوم أخف من الهواء

Copper	Properties	Uses
 	**Physical properties** خواص فيزيائية 1-Copper conducts electricity and heat يقوم النحاس بتوصيل الكهرباء والحرارة 2-Copper can be stretched النحاس يمكن رفيع ومرن أن تمتد إلى سلك 3-Conduction electricity) it can transfer heat and conduct electricity توصيل الكهرباء قادر على نقل الحرارة وتوصيل الكهرباء	Copper is a metal that is used to make: النحاس معدن يستخدم في صنع 1-Electrical wires الأسلاك الكهربائية 2-Cooking pots -اواني الطبخ

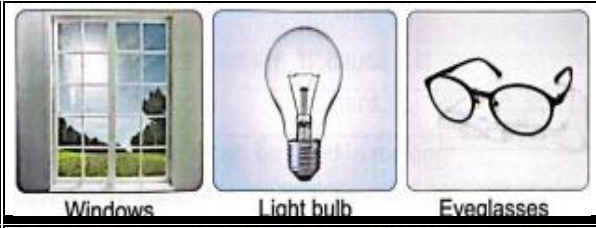
Give reason for :Electric wires are made up of copper
الأسلاك الكهربائية مصنوعة من النحاس
Because copper is a good conductor of electricity and can be stretched into a thin, flexible wire.لأن النحاس موصل جيد للكهرباء ويمكن شده إلى سلك رفيع ومرن

Wood and plastic are **bad conductors** of heat so, they can be used in making **handles** of cooking pans
الخشب والبلاستيك موصلان سيئان للحرارة ، لذا يمكن استخدامهما في صنع مقابض لأواني الطبخ ملاحظة

Activity 9 Uses of Mother

Uses of Matter استخدامات المادة

The knowledge of the properties of matter helps us to know the way to use it best تساعدنا معرفة خصائص المادة على معرفة أفضل طريقة لاستخدامه

Matter المادة	Properties الخصائص	Purpose (Uses) الاستخدام	
1-Steel	Hard متين Strong قوى	Screwdrivers المفكات Hammers المطارق	 Screwdrivers Hammers
2-Glass	Transparent شفاف Smooth ناعم	Windows نوافذ Eyeglasses نظارة light bulb مصباح	 Windows Light bulb Eyeglasses
3- Rubber.	Waterproof ضد للماء Flexible مرن	Tires الإطارات Gloves القفازات Athletic shoes الاحذية الرياضية	 Tires Gloves Athletic shoes

Give reasons for... اذكر أسباب

1-Cooking pots are made of metals اواني الطهي مصنوعة من المعدن

Because metals are good of heat. لأن المعادن موصلات جيدة للحرارة

2- Handles of cooking pots are made of plastic or wood.

مقابض أواني الطهي مصنوعة من البلاستيك أو الخشب

Because plastic or wood are bad conductors of heat.

لأن البلاستيك أو الخشب موصلات سيئة للحرارة.

3.Wood cannot be used to make electric wires الخشب لا يستخدم في صناعة أسلاك الكهرباء

because wood is not easily stretched and does not conduct electricity well.

لأنه لا يمكن تشكيله على هيئة أسلاك، ولا يوصل الكهرباء.

What happens if... ماذا يحدث إذا

1-Handles of cooking pots are made of metals? مقابض اواني الطهي مصنوعة من المعدن

Your hand will be hurt (burned) because metals are good conductors of heat.

سوف تتأذى (تحترق) يدك لأن المعادن موصلات جيدة للحرارة-.

Conduction It is the ability of the substance to transfer heat and conduct electricity.

التوصيل هو قدرة المادة على نقل الحرارة وتوصيل الكهرباء

Dictionary قاموس

الكلمة	معناها	الكلمة	معناها
used to fill	لملء البالونات	Helium	الهليوم
fill blimps	لملء المناطيد	lighter than	أخف من
not flammable	غير قابل للاشتعال	Electrical wires	الأسلاك الكهربائية
not poisonous	ليست سامة	Cooking pots	اواني الطبخ
Steel	فُولاَذ	Strong	قوى
Hard	متين	Screwdrivers	المفكات
Transparent	شفاف	Windows	نوافذ
Waterproof	ضد للماء	Gloves	القفازات
Rubber	مطاط	Smooth	ناعم
Flexible	مرن	Hammers	مطارق
Eyeglasses	نظارة	Athletic shoes	الاحذية الرياضية

Exercises on Lesson (4)

1-Choose the correct answer?

1.Helium is lighter than air, this property is considered as……..

a. a physical property only b. a chemical property only
c. both physical and chemical property d. neither physical nor chemical property

2. Blimps are filled with…… to rise up in the air

a. oxygen gas b. carbon dioxide gas c. atmospheric air d. helium gas

3.We can use copper to make .

a. handles of cooking pans b. body of cooking pans
c. gloves d. tires

4. Steel is used in making hammers, because it is .

a. flexible b. smooth c. hard d. transparent

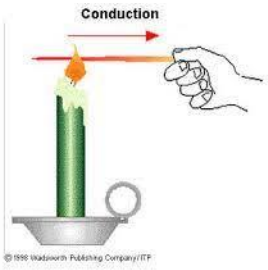
5. Glass is transparent, so it can be used in making

a. eyeglasses b. tires c. screwdrivers d. gloves

6. When you put a lighting match close to helium gas, it will…….

a. burn b. not burn c. form fire d. freeze

7. If you touch the end of the copper bar shown in the figure, you will feel hot because copper is……



a good conductor of electricity b. bad conductor of electricity
c. good conductor of heat d. bad conductor of heat

8. All the following are from physical properties of copper, except that it is

a. it is good conductor of electricity b. it is good conductor of heat
c. it can be stretched into thin wires d. it is lighter than air

9. Rubber is used to make all the following, except .

a athletic shoes حذاء رياضي b. gloves c. tires d. windows

2.Choose from column (A) what suits it in both columns (8) and (C)

(A) Matter	(B) It is used to	(c) Because it is
1.Copper	a. make eyeglasses	A. strong
2.Helium	b. make tires	B. good conductor of electricity
3.Rubber	c. make hammers	C. transparent
4.Glass	d. fill balloons	D. lighter than air
5.Steel	e. make electrical wires	E. flexible

1. ……. → …… 2. …… → …… 3. …….. → ……
4. ……. → …… 5. …… → ……

3. Put (√) or (x): .

From the chemical properties of helium is that it is not flammable. ( )
2. Helium is a gas that can be used safely, because it is poisonous ( )
3. Copper is used in making cooking pans because copper is good conductor of electricity ( )
4. Handles of cooking pans are made of wood or plastic because they are bad conductor of heat ( )

5. Glass is used in making windows, because the glass is a transparent material( )
6. Rubber is very hard, so it is used in making athletic shoes ( )
7. Hammers must be very strong, so they are made of steel ( )
3. When a balloon is filled with helium, it will fall down on the ground ( )

4.Write the scientific term of each of the following:

1. The ability of material to transfer heat and conduct electricity. (…….)
2.It is a light gas which is used in filling blimps (…….)
3. A matter which is used in making gloves because it is waterproof and flexible (…….)

5. Give reasons for

1.Helium is used to fill balloons and blimps

……

2. Human can use helium gas safely

……

3. Wood and plastic are used in making handles of cooking pans

……

6. What happens if

1. A blimp is filled with helium gas

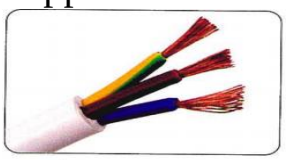
……

2. Electrical wire is made from plastic instead of copper

……

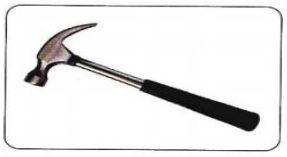
7-Look at the following figures, then choose the suitable material which is use making this objects using the words below

(Rubber - Copper - Glass - Helium – Steel)


1. .....


2. .....


3. .....


4. .....


5. .....

Concept (2.3)

Comparing change in Matter

Lesson(1) Melting Matter

Activity 2 Melting Matter

The three states of matter (-Solid - Liquid - Gas) state


..... state


..... state


..... state

Water is a matter that can be found in the three states of matter which are solid liquid and gas state

الماء هو مادة يمكن العثور عليها في حالات المادة الثلاث وهي الحالة الصلبة والسائلة والغازية

Put a bowl contains ice cubes in a hot place, you will find water in the bowl instead of ice cubes.

That means the ice melts and it is turned into water

ضع وعاء يحتوي على مكعبات ثلج في مكان ساخن ، ستجد ماء في الوعاء بدلًا من مكعبات الثلج .هذا يعني أن الجليد يذوب ويتحول إلى ماء

Melting process in which a matter is changed from solid to liquid state when its temperature increases (by heating)

عملية الانصهار التي يتم فيها تغيير الحالة من الحالة الصلبة إلى الحالة السائلة عندما ترتفع درجة حرارتها (عن طريق التسخين)

Matter can be changed from one state to another without any change in its amount so there is no change in the total number of particles of the matter during the change of the state of matter

يمكن تغيير المادة من حالة إلى أخرى دون أي تغيير في مقدارها بحيث لا يكون هناك تغيير في العدد الإجمالي لجسيمات المادة أثناء تغيير حالة المادة

Thermal energy الطاقة الحرارية

Thermal energy is not a physical thing (material) but it is an energy in the form of heat

الطاقة الحرارية ليست شيئًا فيزيائيًا (مادة) ولكنها طاقة على شكل حرارة

We use thermal energy every day in many things such as cooking food and warming homes

نستخدم الطاقة الحرارية كل يوم في العديد من الأشياء مثل طهي الطعام وتدفئة المنازل

The thermal energy from the Sun keeps living things on the Earth alive

تحافظ الطاقة الحرارية المنبعثة من الشمس على الكائنات الحية على الأرض على قيد الحياة

Particles in motion الجسيمات المتحركة

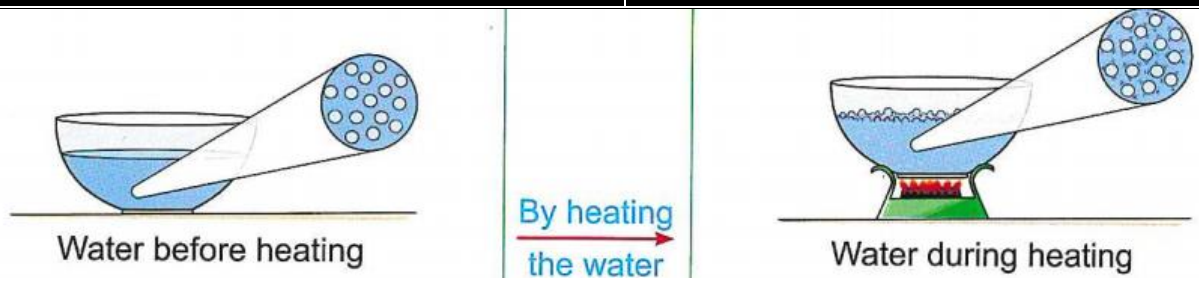
Any matter is made up of very small particles. أي مادة تتكون من جزيئات صغيرة جدًا

Particles in matter are always in motion state even in solids that their particles are close together

- تكون الجسيمات في المادة دائمًا في حالة حركة حتى في المواد الصلبة التي تكون جزيئاتها قريبة من بعضها البعض. .

:The effect of thermal energy on the motion of particles

Water before heating الماء قبل التسخين	Water during heating الماء أثناء التسخين
Particles in matter have energy that make them able to move, vibrate and spin around تتمتع الجسيمات في المادة بطاقة تجعلها قادرة على الحركة والاهتزاز والدوران	When particles of matter absorb more thermal energy, they move, vibrate and spin around faster that causes this matter becomes warmer عندما تمتص جزيئات المادة المزيد من الطاقة الحرارية، فإنها تتحرك وتهتز وتدور بشكل أسرع مما يجعل هذه المادة أكثر دفئًا



Note

Light energy is like thermal energy, as when particles of a matter absorb them, particles move, vibrate and spin faster

ملاحظة

طاقة الضوء تشبه الطاقة الحرارية، فعندما تمتصها جزيئات المادة، تتحرك الجزيئات وتهتز وتدور بشكل أسرع

Concept 2.3

Exercises on Lesson (1)

1-Choose the correct answer?

1. When ice melts, it turns from…… state to…… state

a. liquid-solid b. solid-liquid c. liquid - gas d. solid-gas

2. When ice kept in a cold temperature, it……

a. turns into water b. turns into steam

c. remains as it is d. becomes unclear

3. Ice can turn into water by……

a. cooling b. freezing c. rusting d. heating

4.Which of the following matter has a definite volume and shape …….

a. Water b. Milk c. ice d. Air

5.Which of the following matter takes the shape of container but has a definite volume? ….

a. Milk b. Ruler c. Water vapour d. Apple

6. Which of the following matter takes the shape and the volume of the container

a. Water b. Juice c. Ice d. Water vapour

7. When the water is heated, its particles .

a. move slower b. move faster d. do not move c. move with the same speed

8. All the following happen to the particles of oil when it is cooled, except that they

a. move slower. b. move faster c. vibrate less d. come close together

9. When we heat a liquid, the distance between its particles will

a. decrease b. increase c. not be affected d. become zero

10. Which of the following matter its particles are very close together?

a. Oxygen gas b. Water c. oil d. Wood

2.Choose from columns (B) what suits it in column (A):

(A)	(B)
1. Oxygen gas	a. has a definite volume and shape
2. Oil	b. has a definite shape, but it don't has a definite volume
3. A piece of rock	c, has a definite volume, but it don't has a definite shape
	d. doesn't have a define volume and shape

1……. 2…… 3…….

3. Put (√) or (x): .

1. The mass of an amount of apple juice will change it we mix it with water. ( )
2. The mass of some pieces of ice will be the same when they are melted ( )
3. An ice cream turns into liquid by cooling . ( )
4. If we increase the temperature of some pieces of ice, they will melt ( )
5. Water is considered as a liquid matter because it has definite shape and volume( )
6. Carbon dioxide gas doesn't have definite shape and volume ( )
7. When parts of a matter aborts thermal energy they move slower ( )
8. If a matter absorbs light energy, its particles vibrate and move faster ( )
9. Particles of solid matter are spread out from each other ( )

4.Write the scientific term of each of the following

1.It is a process by which a matter is changed from solid to liquid state (……)

2.The state of matter in which matter has definite volume and shape (……)

3.The state of matter in which matter has definite volume and takes the shape of its container (……)

4. The state of matter in which matter takes the volume and the shape of its container (……)

5.Give reasons for the following

1.Ice is turned into water when it is placed in a warm room

……

.2.Juice is considered as a liquid state of matter .

……

3. When particles of cold water absorb thermal energy, the water becomes warmer .

……

6.What happens if

1. The motion of water particles if we heat an amount of water

……

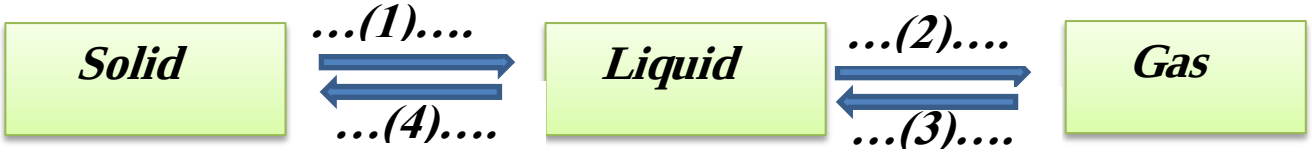
2..We increase the temperature of some ice cubes .

……

3.We heat an amount of water (according to the motion of particles).

……

7.Complete the following diagram:



1…… 2……

3…… 4……

Lesson(2) Temperature and States of Matter

Activity 6 Temperature and States of Matter

Relationship between Temperature and State of Matter

It measures how much the particles inside the matter have energy

يقيس مقدار الطاقة التي تمتلكها الجسيمات داخل المادة

Solid particles have less energy and move slower

Liquid particles have more energy and move faster

How does the water state change

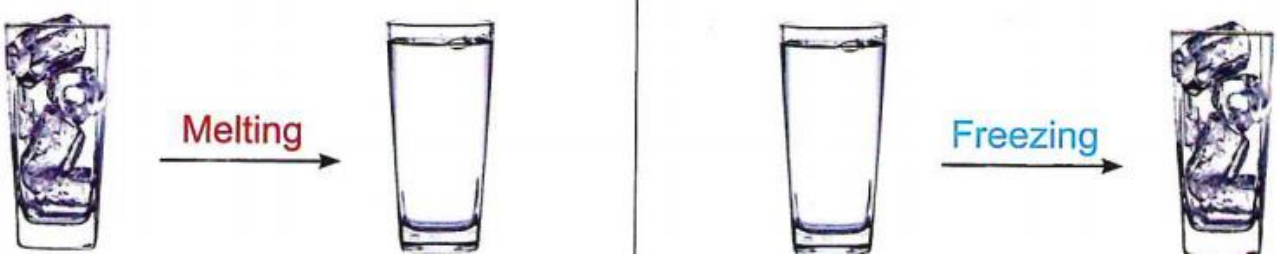
Solid *(Ice)* ⇄ **Melting by heating** / **Freezing by cooling** ⇄ **Liquid** *(water)*

Water is a liquid between 0°C and 100°C

The freezing point of water is 0°C

How does the water state change ?

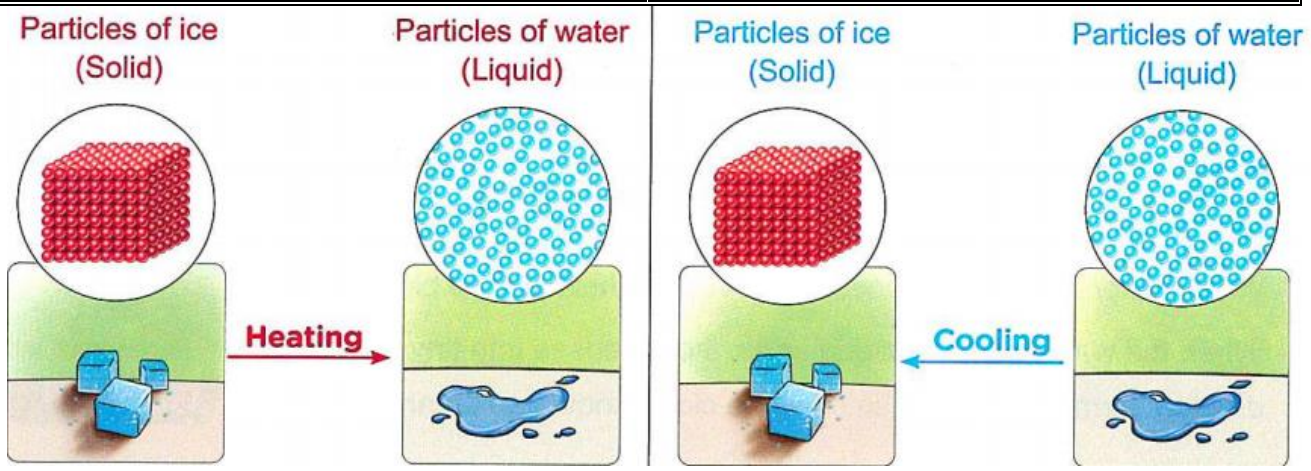
Melting	Freezing
In this process, the particles of a solid matter gain energy. This causes particles to move around more and their temperature increases. So, the matter changes to liquid state For example * When the temperature of solid ice increases above 0°C, its particles gain energy and they move around more, so the ice changes to liquid water	In this process, the particles of liquid matter release energy. This causes particles to move slower and their temperature decreases. So, matter changes to solid state For example When the temperature of liquid water decreases below 0°C, its particles release energy and they move slower, so liquid water changes to solid ice



Physical Change It is a change that happens to the matter without changing. Its structure (nature)

التغيير الطبيعي هو التغيير الذي يحدث للمادة دون تغيير تركيبها (الطبيعة)

Changing a solid to a liquid Melting	Changing a liquid to a solid Freezing
When placing a container of ice cubes on a hot stove ↓ The ice gains thermal energy ↓ So, the particles of ice move faster and separate from each other. This causes the change of the ice from solid state to liquid state (water).	When placing a water container in a freezer ↓ The water loses the thermal energy to the space in the freezer. ↓ So, the particles of water move slower and get close together. This causes the change of the water from liquid state to solid state (ice).

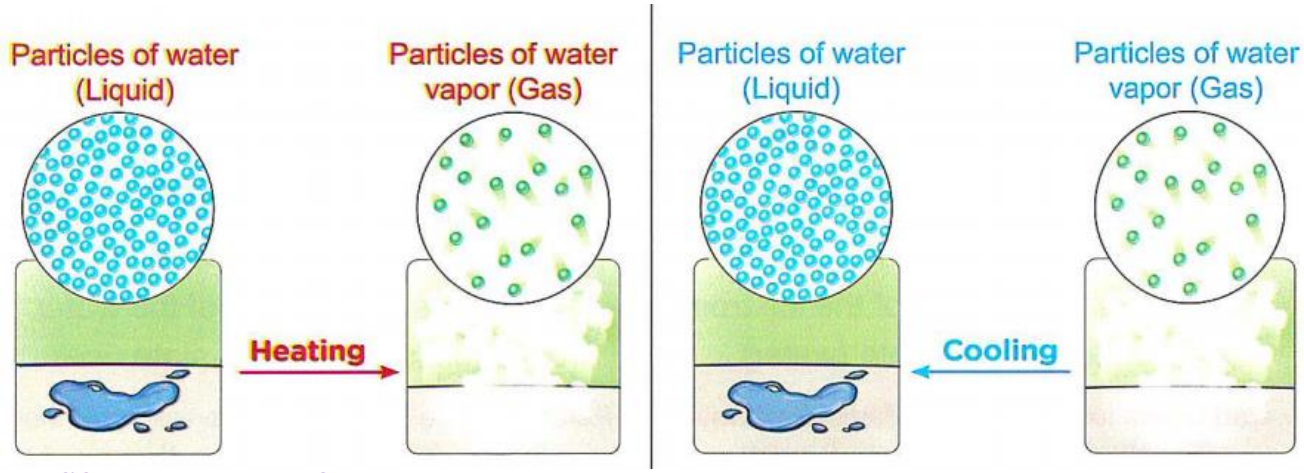


Give a reason for:

Freezing process causes decrease in the speed of the particles of matter.

Because in freezing process the particles of matter lose the thermal energy, so the particles move slower.

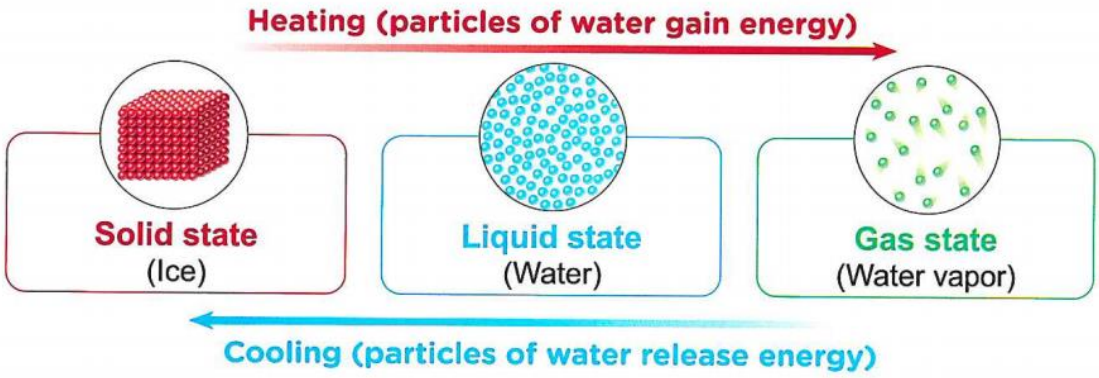
Changing a liquid to a gas (Evaporation)	Changing a gas to a liquid (Condensation)
When boiling a water container on a hot stove: The water gains thermal energy ↓ So, the particles of water move more faster and separate much more from each other. ↓ This causes the change of the water from liquid state to gas state (water vapor)	When water vapor touches a cold lid The water vapor loses the thermal energy to the cold lid. ↓ So, the particles of water vapor move slower and get close together. ↓ This causes the change of water vapor from gas state to liquid state (water).



Give a reason for:

We can see steam during cooking food.

Because when the water vapor hits cooler air, it condenses into tiny droplets which looks like small white clouds that are visible.



Exercises on Lesson (2)

1-Choose the correct answer?

1. Freezing of liquid chocolate needs high …… temperature

a. high b. low c. warm d. very

2. The reversible changes of matter are usually

a physical changes only. b. chemical changes only

c. both physical and chemical changes

d. neither chemical nor physical changes

3.In freezing process, the particles of matter lose energy and……

a move with high speed. b. move with very high speed

c move with low speed d. don't move

4-Condensation changes the matter from…… state to…… state

a. solid-liquid b. liquid-gas c. gas - liquid d. liquid - solid

5-When we boil water, it will……..

a. condense b. freeze c. melt d. evaporate

6-When ice cubes gain ……energy, they turn into water

a. sound b. potential c. electrical d. thermal

7-Physical changes of matter include

a. melting only b. freezing only

c. both melting and freezing d. neither melting nor freezing

8-Increasing the temperature of a matter means that its particles……

a. have low energy b. have high energy c. have very low energy d.don't have energy

9-Ice is turned into…… when its temperature is between 0°C and 100°C

a. solid state b. liquid state c. gas state d. water vapor

10-When the temperature of water is decreased below 0°C, it will turn into……

a. water vapor b. clear water c. colored water d. ice

11-Physical processes which need heating include

a. melting and freezing b. melting and condensation

c. melting and evaporation d. freezing and evaporation

12-To change water from solid state. to liquid and then to gas state, we need to…… the temperature

a. fix b. increase c. decrease d. reduce

13-The two processes which cause particles of matter get close together are……..

a. freezing and condensation b. freezing and melting

c. freezing and evaporation d. melting and condensation

14-In cold weather, drops of water are ……..on the windows of houses

a, melted b. evaporated c. condensed d. freezed

2.Choose from columns (B) what suits it in column (A):

(A)	(B)
1. Condensation	a. is the change of water from solid state to liquid state
2. Melting	b. is the change of water from gas state to solid state
3. Freezing	c, is the change of water from gas state to liquid state
4-Evaporation	d. is the change of water from liquid state to gas state
	e. is the change of water from liquid state to solid state

1……. 2……. 3……. 4…….

3. Put (√) or (x): .

1.When ice is heated, it will freeze ( )
2. When a solid matter gains thermal energy, it will change into liquid state ( )
3. Freezing takes place by cooling, while melting takes place by heating. ( )
4.Melting and freezing are reversible processes. ( )
5.Water remains liquid between 0°C and 100°C. ( )
6. Freezing means that matter changes from solid state to liquid state ( )
7-Evaporation process means that matter changes from liquid state to gas state ( )
8-When hot water vapor hits cooler air it forms steam ( )
9-Increasing temperature means that particles of matter have low thermal energy( )
10-When the particles of matter move with high speed, its temperature will decrease ( )
11-When chocolate melts, its particles get closer together ( )

4-Complete the following sentences using words below

(reverse-thermal energy - water - physical)

1-When heating an amount of water it gains ……. that makes its particles move more faster.
2-Melting is the …….process of freezing
3-Chocolate melts when exposed to high temperature, this change is called ……change
4-0º C is the freezing point of…….

5.Write the scientific term of each of the following

1-They are changes in matter which are usually reversible and don't affect its structure (……..)
2. It is the process by which the particles of matter gain energy and changes from solid to liquid state (……..)
3. It is the process by which the particles of matter lose energy and changes from liquid to solid state (……..)
4.The state of water when its temperature is between 0°C and 100°C

6-Give reasons for

1-When the temperature of ice cubes Increases, they melt
.....
2-Both melting and freezing processes are considered as physical changes
.....
Formation of water drops when water vapor touches a cold surface
.....

7-What happens to

1-The particles of water when its temperature is decreased below 0°C
.....
2-The particles of water when we increases temperature above 100°C
.....

Lesson(3)

Mixtures

Activity (9) Mixtures

Mixtures and Compounds

الخليط Mixture	مركب Compounds
A mixture is a matter formed of two or more materials الخليط عبارة عن مادة تتكون من مادتين أو أكثر The materials that form a mixture don't combine chemically and mixing them does not change them into new substances المواد التي تشكل خليطًا لا تتحد كيميائيًا ولا يؤدي خلطها إلى تغييرها إلى مواد جديدة	A compound is a matter formed of two or more materials المركب هو مادة مكونة من مادتين أو أكثر The materials that form a compound combine chemically to form a completely new substance تتحد المواد المكونة للمركب كيميائيًا لتكوين مادة جديدة تمامًا

Mixtures can be made of-

Solid materials	Solid and liquid materials	Gas materials
Sand and rocks	Salty water	Air
		

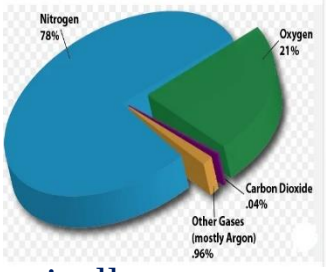
Activity (8) Mixtures

Examples of mixtures

1. Components of some mixtures .

Can be seen by eyes, such as the components of a mixture of nuts

2-Cannot be seen by eyes,



but we need special equipment to see its components, such as the components of air that is .formed of some gases

Properties of mixture خصائص الخليط

.All materials that form a mixture don't combine chemically

جميع المواد التي تشكل خليطًا لا تتحد كيميائيًا

Each material in a mixture keeps its properties that you can use to identify it such as Sugar does not lose its sweetness when it is dissolved in water

تحتفظ كل مادة في الخليط بخصائصها التي يمكنك استخدامها للتعرف عليها مثل السكر لا يفقد حلاوته عندما يذوب في الماء

.In fruit salad, you can identify each type of fruit in the fruit salad

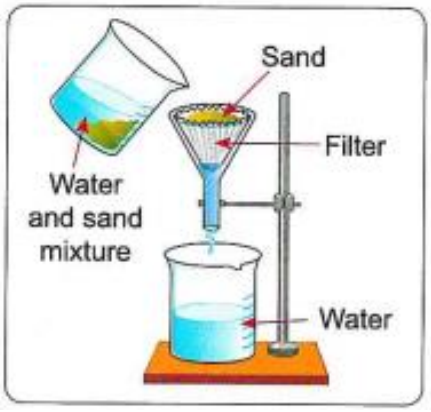
.The components of a mixture can be separated after mixing them

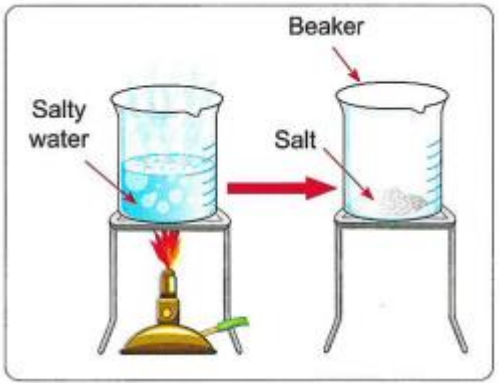
.في سلطة الفاكهة ، يمكنك تحديد كل نوع من أنواع الفاكهة في سلطة الفاكهة .يمكن فصل مكونات الخليط بعد خلطها..

Separating mixtures

There are many methods to separate the components of mixtures such

ترشح **Filtration**	التبخر **Evaporation**
A filter can be used to separate a mixture if one material in the mixture has smaller particles than the particles of other materials. يمكن استخدام مرشح لفصل خليط إذا كانت إحدى المواد في الخليط تحتوي على جزيئات أصغر من جسيمات المواد الأخرى **Example** separation sand from Water and sand mixture مثال فصل الرمل عن خليط الماء والرمل.	Evaporation can be used to separate materials that evaporate at different temperature يمكن استخدام التبخر لفصل المواد التي تتبخر عند درجات حرارة مختلفة **Example** Separating the salt from a mixture of salty water by heating the salty water, the water will evaporate leaving the salt in the beaker. مثال فصل الملح عن خليط من الماء المالح عن طريق تسخين الماء المالح ، وسوف يتبخر الماء تاركا الملح في الدورق



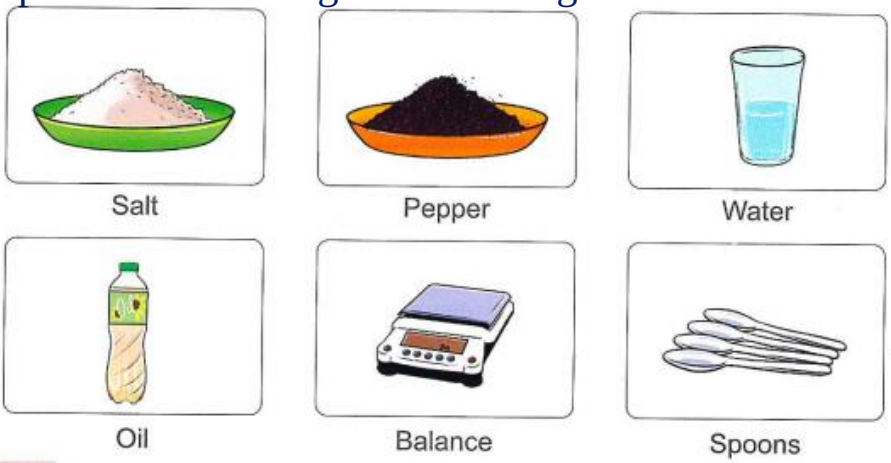


Activity 7 Mixing It Up with Mass

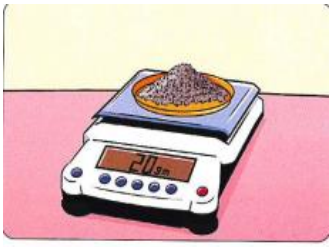
► You have learned that when we mix substances, mixtures or compounds are formed.

So, when mixing substances, what happens to their masses after mixing when their properties change and when their properties don't change?

Experiment 1 To show what happens to masses of substances after mixing when their properties don't change after mixing.



Steps


Salt and pepper

1. Weigh 10 g of salt and 10 g of pepper using the balance.
2. Mix the salt and pepper together using a spoon, then weigh the mass of this mixture and compare between the summation of their masses before and after mixing.

► Observations

* The summation of their masses before mixing equals the summation of their masses after mixing.
* The properties of the substances don't change after mixing.


Water and oil

3. Weigh 10 g of water and 10 g of oil using the balance.
4. Mix the water and oil together using a spoon. then weigh the mass of this mixture and compare between the summation of their masses before mixing and after mixing.

► Observations

Water and oil

-The summation of their masses before mixing equals the summation of their masses after mixing

-The properties of the substances don't change after mixing


Salt and water

5. Weigh 10 g of salt and 10 g of water using the balance.
6. Mix the salt and water together using a spoon, then weigh the mass of this mixture and compare between the summation of their måsses before mixing and after mixing.

Observations

* The summation of their masses before mixing equals the summation of their masses after mixing.
* The properties of the substances don't change after mixing.

Conclusion

The masses of substances before mixing are equal to the masses of these substances after mixing when their properties don't change (when forming a mixture)

Experiment 2

To show what happens to masses of substances after mixing when their properties change after mixing.

Tools

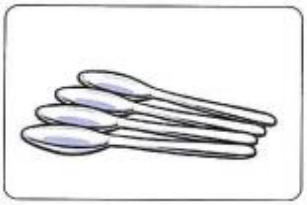

Vinegar


Baking soda


Iodine

Cornstarch


Balance


Spoons

Steps

1. Weigh 10 g of vinegar and 10 g of baking soda using the balance.
2. Mix the vinegar and baking soda together using a spoon, then weigh the masses of them after mixing and compare between their masses before mixing and after mixing.


Vinegar and baking soda

Observations

* The summation of their masses before mixing equals the summation of their masses after mixing.
* A gas formed causing bubbles which means that the properties of the substances change after mixing.

3. Weigh 10 g of corn starch and 10 g of iodine using the balance.
4. Mix the cornstarch and iodine together using a spoon, then weigh the masses of them after mixing and compare between their masses before mixing and after mixing.


Cornstarch and iodine

► Observations

The summation of their masses before mixing equals the summation of their masses after mixing.

* A compound formed and its color is dark blue which means that the properties of the substances change after mixing.

Conclusion

The masses of substances before mixing are equal to the masses of these substances after mixing when their properties change (when forming a compound)

Exercises on Lesson (3)

1-Choose the correct answer?

1-Among mixtures which are made up of solid materials only is the mixture of……

a. salt and water b. sand and rocks c. sugar and water d. oxygen and helium

2-Salt can be separated by……. of salty water

a. melting b. evaporation c. freezing d. condensation

3-By adding baking soda to vinegar, a…… is formed

a. powder b. compound c. mixture d. solid matter

4-By adding iodine to starch, the color of the formed compound will change into……..

a. dark blue b. dark green c. orange d. yellow

5-If we mix two equal masses of salt and oil so, their total mass will after mixing

a. equal to zero b. decrease c. increase d. not change

6-To separate sand only from salty water, we can use

a. filtration b. evaporation c. melting d. freezing

7-A compound has all the following properties, except that its components …….

.a. combine chemically b. form new substance

c. change in their shapes d. do not change chemically or physically

8-The of iodine will not change after mixing it with starch

a. mass only b. color only c. color and mass d. properties and mass

9-If we have 6 g of water and 6 g of sugar, after mixing them the mass of whole mixture will be……g

a. 15 b. 10 c. 12 d. 6

10-If we mix 150 g of banana with 50 g of apple, the mass of banana only will be…… g after mixing

a. 50 b. 100 c. 200 d. 150

3. Put (√) or (x): .

1-We can use evaporation process to form mixtures ( )

2-The properties of the components of a mixture change after mixing them with each other ( )

3-Evaporation and filtration are ways of mixtures separation ( )

4-The substances that form a compound combine physically forming a new substance ( )

5-By adding iodine to starch, their masses and color will not change ( )

6-You can see the different components of the salty water

7-Sand and rocks mixture is considered from solid and liquid mixtures ( )

8-The mass and properties of oil will change when mixing it with vinegar ( )

9-The properties of mango will be the same if we mix it with banana ( )

10-By mixing some vegetables together their properties will change ( )

11-If we add 10 g of salt to 5 g of pepper, the mass of mixture will be 15 g ( )

12-The mass of 50 g of sugar will decrease by adding it to 100 g of water ( )

3-Complete the following sentences using the words below

(dissolves-filtration - the same - gas)

1-To separate sand from a mixture of water and sand we can use ……process

2-The evaporation process can be used to separate a solid material that in ……..a liquid

3-Mixing vinegar and baking soda cause the formation of a……..

4-The mass of salt in salty water will be ……..after the mixture is formed

4-Write the scientific term of each of the following

1-A matter that is formed when two or more materials combine chemically (……)

2-It is the substance that consists of more than one matter and don't have any chemical change in their properties (……..……)

5-Give reasons for

1-Fruit salad and salty water are considered as mixtures

……

2-Filtration process is used to separate soil from water

……

3-By adding baking soda to vinegar the properties of each of them are changed

……

6-What happens to

1-Salty water if heated for a long time

……

2-The mass and properties of sugar when adding it to an amount of flour

……

Lesson (4)

Physical Changes In Our Lives

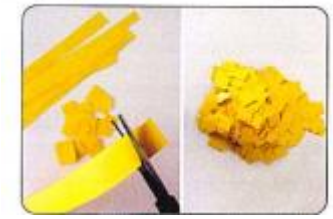
Physical change is a type of changes that may occur to different materials around us have learned that physical change is a change in matter without any change in structure

Physical changes don't form something's new (new substances) but they can change size, shape or state of matter

التغير الفيزيائي هو نوع من التغيرات التي قد تطرأ على المواد المختلفة من حولنا وقد تعلمنا أن التغير الفيزيائي هو تغير في المادة دون أي تغير في الشكل* لا تشكل التغيرات الفزيائيه شيئًا جديدًا (مواد جديدة) ولكنها تستطيع تغيير الحجم أو الشكل أو حالة المادة

Examples of changes in our lives

أمثلة على التغيرات في حياتنا

physical changes	Not physical changes
paper	
Cutting a paper into small pieces. 	**Burning a paper** forming ash 
In cooking	
Making salad Cutting vegetables don't make them different but they have the same taste with changes in their sizes 	**Making bread**: The baker mixes flour, water, sugar and yeast, then the baker bakes them. * The taste of the bread is not like its ingredients 

G.r cutting a paper into small pieces is considered as a physical change.

Because cutting a paper is a change of the shape of the paper without any change in its structure

G.r: يعتبر تقطيع الورقة إلى قطع صغيرة بمثابة تغير فيزيائي.
لأن قطع الورقة هو تغيير في شكل الورقة دون أي تغيير فيها تركيبها

Chemical Changes

some changes that happen to matter which are called physical changes and there are some other changes which are not physical changes. In this activity we will know that the not physical changes" are called "chemical changes

بعض التغيرات التي تحدث للمادة تسمى تغيرات فيزيائية وهناك بعض التغيرات الأخرى التي ليست تغيرات فيزيائية وفي هذا النشاط سنعرف أن التغيرات غير الفيزيائية تسمى تغيرات كيميائية.

Chemical change التغير الكيميائي

It is a change in matter with a change in its structure producing a new matter (substance)

هو تغير في المادة مع تغير في بنيتها ينتج عنه مادة جديدة.

Chemical changes differ from physical changes, where chemical changes are not reversed easily

التغيرات الكيميائية تختلف عن التغيرات الفيزيائية حيث لا يمكن عكس التغيرات الكيميائية بسهولة..

The new matter (substance) which is formed due to the chemical changes has some properties, where *

*المادة الجديدة التي تتكون نتيجة للتغيرات الكيميائية لها بعض الخصائص حيث:

This new substance is different physically from the original substances such as its shape, color .... etc. -

-تختلف هذه المادة الجديدة فيزيائيا عن المواد الأصلية مثل شكلها ولونها .... الخ.

This new substance has different chemical properties that differ from the chemical properties of the original substances. -

-تختلف هذه المادة الجديدة عن المواد الأصلية بخصائص كيميائية مختلفة.

Some examples of chemical changes :

بعض الأمثلة على التغيرات الكيميائية:

1-When Iron combines (reacts) with oxygen and water they form rust

Rust is a chemical substance called iron oxide which is layer with reddish color

1- عندما يتحد الحديد (يتفاعل) مع الأكسجين والماء يتكون الصدأ

الصدأ عبارة عن مادة كيميائية تسمى أكسيد الحديد وهي عبارة عن طبقة ذات لون محمر

Rusting of a vehicle

Rusting of an iron nail

2-when oxygen combine with carbon and hydrogen they release heat that that can start fire

Fire change wood to ash

2- عندما يتحد الأكسجين مع الكربون والهيدروجين فإنهم يطلقون حرارة يمكن أن تؤدي إلى اشتعال النار

• النار تحول الخشب إلى رماد

3-When vinegar combine with baking soda they form gas bubbles

3- عندما يمتزج الخل مع صودا الخبز تشكل فقاعات غازية

4-digestion food inside body take place as result some chemical change

4- يحدث هضم الطعام داخل الجسم نتيجة حدوث بعض التغيرات الكيميائية

How has it changed

there are two types of changes of whatever that happen wound us in our daily life which are physical and chemical changes The Allowing evidence can be used to differentiate between the physical and chemical changes

هناك نوعين من التغيرات مهما حدث ويجرحنا في حياتنا اليومية وهي التغيرات الفيزيائية والكيميائية ويمكن استخدام الأدلة المسموح بها للتمييز بين التغيرات الفيزيائية والكيميائية

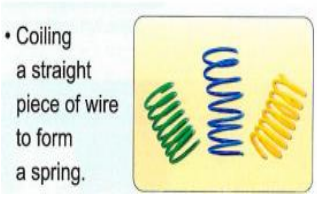
evidence that describes physical changes Some الأدلة التي تصف التغيرات الجسدية بعض

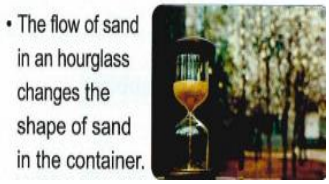
1-Change in shape and size

Cutting paper -cutting fruit

Coiling a straight piece of wire to form spring

The flow of sand in an hourglass changes the shape of sand in the container





تغير في الشكل والحجم

قطع الورق - قطع الفاكهة

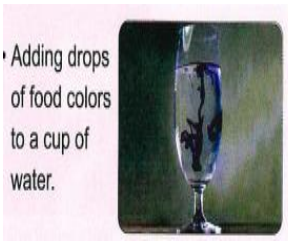
لف قطعة مستقيمة من السلك لتكوين الزنبرك

يؤدي تدفق الرمل في الساعة الرملية إلى تغيير شكل الرمل الموجود في الحاوية

2-Expected change in color التغيير المتوقع في اللون

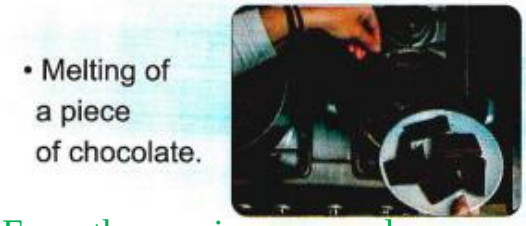
Adding drops of food colors a cup of water

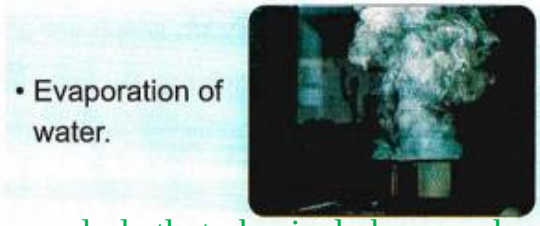
إضافة قطرات من ألوان الطعام إلى كوب من الماء



3-Change in state of matter تغير في حالة المادة

Examples Melting of chocolate ذوبان الشوكولاتة Evaporation of water تبخر الماء





From the previous examples, we can conclude that physical changes don't produce new substances ومن الأمثلة السابقة يمكننا أن نستنتج أن التغيرات الفيزيائية لا تنتج مواد جديدة

Some evidence that describes chemical changes بعض الأدلة التي تصف التغيرات الكيميائية

1-Unexpected color change تغير اللون غير متوقع

When mixing iodine with starch, a new substance is formed and its color is dark blue.

عند خلط اليود مع النشا تتكون مادة جديدة ويكون لونها أزرق غامق.

2-Formation of gas bubbles تكوين فقاعات الغاز

When mixing baking soda with vinegar, gas bubbles appear

عند خلط صودا الخبز مع الخل تظهر فقاعات الغاز

Formation of strong odor تكوين رائحة قوية

Leaving a cup of milk out of the fridge for about two days can produce a bad smell

ترك كوب من الحليب خارج الثلاجة لمدة يومين يمكن أن يؤدي إلى رائحة كريهة

From the previous examples, we can conclude that chemical changes produce new substances. ومن الأمثلة السابقة يمكننا أن نستنتج أن التغيرات الكيميائية تنتج مواد جديدة .

Exercises on Lesson (4)

Choose the correct answer:

1-iron nail will rust when it reacts with

a- carbon dioxide and water b- oxygen and vinegar
c- carbon dioxide and vinegar d -oxygen and water

2-Bunning of a paper is considered as ……change of matter

a-only chemical b- neither physical nor chemical
c-Both physical and chemical d- only physical

3-Among examples of physical changes is……..

a-meeting of iron b-burning of wood
c-making a cake. d-digestion of food

4- Among chemical unexpected color change is the color that is produced from Mixing

a- carbon dioxide and water b- oxygen and vinegar
c- baking soda and vinegar d –iodine with starch

5- changes don't produce new substances .

a-cutting of wood b-rusting of iron
c-Bunning of a paper d-baking a bread

6- changes produce new substances

a-melting of ice b- condensation of water vapor
c- iron rusting d- breaking of glass

2.Choose from columns (B) what suits it in column (A):

(A)	(B)
1. Condensation	a. is the change of water from solid state to liquid state
2. Melting	b. is the change of water from gas state to solid state
3. Freezing	c. is the change of water from gas state to liquid state
4.Evaporation	d. is the change of water from liquid state to gas state
	e. is the change of water from liquid state to solid state

.3. Put (√) or (x):

1.When chocolate melts, its particles get close together ( )
2. Evaporation process means that matter changes from liquid state to gas state( )
3. When hot water vapor hits cooler air it forms steam ( )
4. We can use evaporation process to form mixtures ( )
5. You can see the different components of the salty water ( )
6.The properties of the components of mixture change after mixing them with each other.( )

7. Evaporation and filtration are ways of mixtures separation ( ) ( )
8-The substances that form a compound combine physically forming a new substance
9.Sand and rocks mixture is considered from solid and liquid mixtures ( )

Lesson (5)

Plenty of water, but none to drink الكثير من الماء، ولكن لا شيء للشرب

Although about 70% of the surface of the earth is covered by oceans, many people around the world cannot reach fresh water

على الرغم من أن حوالي 70% من سطح الأرض مغطى بالمحيطات، إلا أن الكثير من الناس حول العالم لا يستطيعون الوصول إلى المياه العذبة

This is because the water of oceans and seas is considered as a mixture of water, salt, other minerals, gases, living organisms and dead organisms, so this water is not suitable for drinking.

وذلك لأن مياه المحيطات والبحار تعتبر خليطاً من الماء والملح والمعادن الأخرى والغازات والكائنات الحية والكائنات الميتة، لذا فإن هذه المياه غير صالحة للشرب.

But we can use desalination processes to drink the water of seas and oceans

ولكن يمكننا استخدام عمليات التحلية لشرب مياه البحار والمحيطات

Desalination it is the process of removing salt from water

تحلية المياه : هي عملية إزالة الملح من الماء

How do we separate fresh drinkable water from the mixture of ocean's water?

We can separate the components of the oceans water as follows

كيف نفصل المياه العذبة الصالحة للشرب عن خليط مياه المحيط؟ ويمكننا فصل مكونات مياه المحيطات على النحو التالي

(1) Filtration (1) الترشيح:

removes any large materials such as seaweed , shells and fish

يزيل أي مواد كبيرة مثل الأعشاب البحرية والأصداف والأسماك

2-evaporation 2- التبخر

Boiling filter water .water vapor rise up leaving salts and other minerals

غليان الماء المفلتر. ويرتفع بخار الماء ويترك أملاحاً ومعادن أخرى

3-by cooling water vapor turn to water safe to drink

3- عن طريق تبريد بخار الماء يتحول إلى ماء صالح للشرب

4-the remained water turned back to sea 4- يعود الماء المتبقي إلى البحر

Problems of desalination مشاكل تحلية المياه

It requires a lot of energy يتطلب الكثير من الطاقة

It is a very expensive process إنها عملية مكلفة للغاية

It may lead to environmental problems such as قد يؤدي إلى مشاكل بيئية مثل

marine organisms can be hurt due to sucking of water into the desalination

يمكن أن تتأذى الكائنات البحرية بسبب امتصاص المياه في عملية التحلية

The water that contains a very large amount of salt is pumped back into the oceans

يتم ضخ الماء الذي يحتوي على كمية كبيرة جدًا من الملح مرة أخرى إلى المحيطات

after desalination, it can be dangerous to the marine life

بعد إزالة المياه، يمكن أن يشكل خطراً على الحياة البحرية

Exercises on Lesson (5)

Choose the correct answer:

1. People cannot drink the water of oceans and seas because it is a mixture of water and …….

a. salt only. c. living organisms only.
b. minerals only. d. salt, minerals and living organisms.

2. Desalination process means that we remove..... from water to drink it.

a. sugar b. salt
c. oxygen gas d. hydrogen gas

3. We can use.....processes to separate fresh drinkable water from the water of seas and oceans.

a. filtration and rusting b. evaporation and coloring
c. filtration and coloring d. filtration and evaporation

4. To separate salt and minerals from seawater, we can use .process.

a. evaporation b. melting
c. freezing d. rusting …

3 Write the scientific term for each of the following:

1. The process of removing salt from salty water.
2. The process which can be used to remove any large materials from sea and Ocean water.
3. The process which can be used to separate salt and minerals from salt water of seas and oceans.

4 Complete the following sentences using the words below:

(salt - filtration - energy - marine - fresh - oceans - expensive - seas)

1. Among the problems of desalination process is that it requires a lot of.. and it is very .....process...
2. After desalinating water, the water that is pumped back to oceans contains very much
3-A large amount of.....which can harm the.....life....water, so we cannot drink the water of

Give a reason for the following:

. We can not drink salt water

……

What happened

You boil sea water for long time

……