

PONY

سلسلة كتب الأستاذ

2023


# SCIENCE

5<sup>ST</sup>  
PRIMARY  
FIRST TERM



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## Concept

# 1

# Plant Needs

### Concept Objectives:

- ▶ Understanding that plants use specialized structures to obtain the materials that they need to grow from sun, air, and water.
- ▶ Developing a model of how energy moves through plants.
- ▶ Developing a model of plant processes that use natural resources to complete life processes.
- ▶ Comparing the structure and function of the transport system in plants with the circulatory system in humans.

### Key Vocabulary

- Arteries
- Circulatory system
- Digestive system
- Dispersal
- Germinate
- Glucose
- Nutrients
- Phloem
- Photosynthesis
- Plant
- Stem
- Stomata
- Survive
- System
- Xylem





## Activity 1 Can You Explain?

» Have you ever planted a seed and watched it grow into a plant?

- 1 A plant is a living organism, like a human being, that goes through different stages of growth.
- 2 A plant needs **water**, **air**, and **light** to carry out its vital processes.



النبات كائن حي كالإنسان يمر بمراحل نمو مختلفة.  
يحتاج النبات إلى (الماء، الهواء، الضوء) للقيام بعملياته الحيوية.

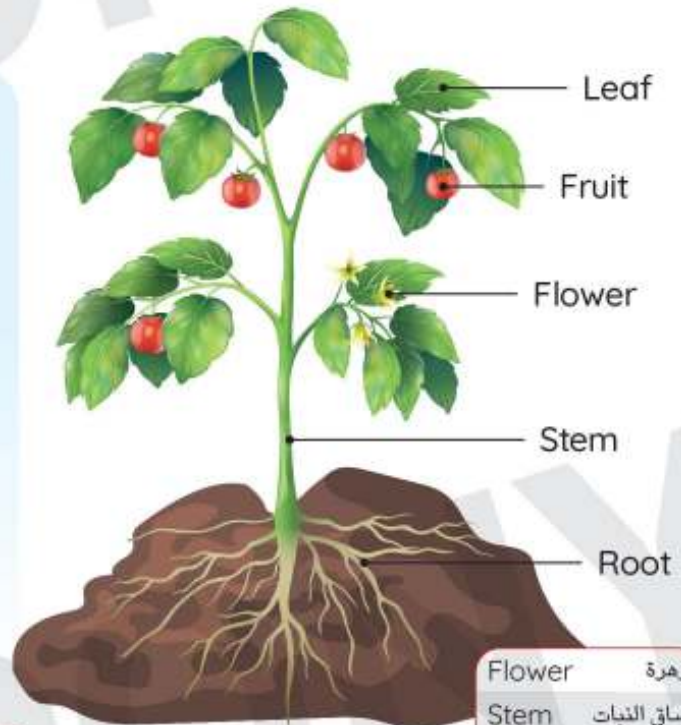
» How do the structures of a plant use water, air, and light to survive?

### Plant Structure

» The plant consists of **roots**, **stems**, **leaves**, and sometimes **flowers** or **fruits**.

- Plant roots absorb **water** and **nutrients** from the soil.
- The other structures of the plant help it to **survive**.

Nutrients عناصر غذائية  
Soil التربة  
Survive يتنجو



Flower زهرة  
Stem ساق النبات  
Leaf ورقة النبات  
Roots جذور النبات  
Fruit ثمرة



## Activity 2

Ask Questions Like a Scientist  
Tree Needs

» What do humans and plants need to grow and survive?

### Humans

» Our bodies need food and water every day to be **healthy** and **grow**.



« يحتاج جسم الإنسان إلى الماء والغذاء يوميًا؛ ليظل سليمًا وصحيًا وينمو ويبقى على قيد الحياة.

### Plants

» Plants use **natural resources** to grow and survive.  
» When we plant a tree, we notice over time that it grows and turns from a **seedlings** into a large **tree**.



« النباتات تستخدم الموارد الطبيعية لتنمو وتزدهر، فعندما نقوم بزراعة شجرة، نلاحظ بمرور الوقت أنها تنمو وتتحول من شتلة إلى شجرة كبيرة.

## Preparing to Plant

To grow a healthy plant, we need

Sunlight



Water and air



Soil



Suitable area

that helps the plant to grow



Check your understanding?



» Which of the following plants will grow healthy?

(A)



(B)



(C)







## Optional Activities

Go Online on

Egyptian Knowledge Bank  
بنك المعرفة المصري

Activity 3 Observe Like a Scientist (Growing)

Activity 4 Observe Like a Scientist (Water in the Desert)



## Activity 5

Evaluate Like a Scientist

What Do You Already Know About Plant Needs?

## Plants



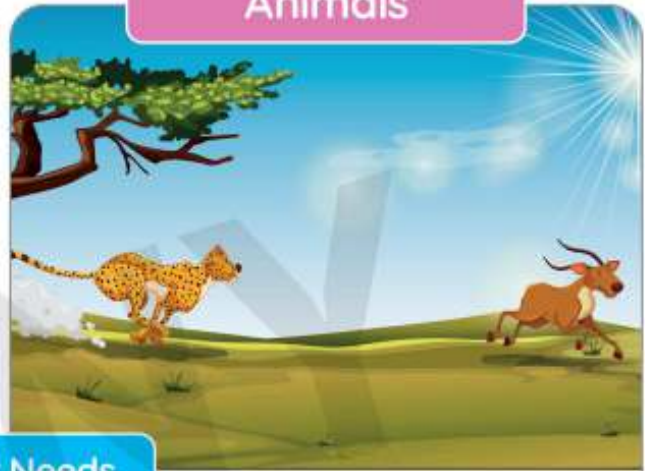
1

## Their Needs

» To survive, plants need:

- 1 Nutrients (عناصر غذائية)
- 2 Water
- 3 Carbon dioxide gas
- 4 Sunlight

## Animals



» To survive, animals need:

- 1 Food
- 2 Water
- 3 Oxygen gas
- 4 Shelter (المأوى)

2

## How they get food

» Plants can make their own food through the **photosynthesis** process.

» Most animals **move** to search for food.



## Important Notes:

» Both animals and plants are similar in their need for **air** and **water**.

» Plants don't need food because they can make their own food.

يتشابه كل من الحيوانات والنباتات في احتياجهم للهواء والماء. - النبات لا يحتاج للغذاء؛ لأنه يستطيع صنعه بنفسه.

## Some wrong concepts about plants needs

1

Plants, like humans and animals, need oxygen gas only.



Plants need carbon dioxide gas and they produce oxygen gas through the photosynthesis process.



يعتقد البعض أن النبات مثل الإنسان والحيوان يحتاج إلى غاز الأكسجين فقط، لكن على العكس فإن النبات يحتاج غاز ثاني أكسيد الكربون، ويقوم بإنتاج غاز الأكسجين خلال عملية البناء الضوئي.

2

All plants need soil to survive.



Many plants need soil to grow, while some don't.



يعتقد البعض أن كل النباتات تحتاج للتربة لتستطيع النمو والبقاء، لكن الحقيقة أن الكثير من النباتات يحتاج إلى التربة للنمو، بينما لا يحتاج البعض الآخر.



### Important Note:

- The liquid produced from the tree sap is not an evidence that plants need sugar.

السائل الذي يُنتج من عصارة الأشجار لا يعتبر دليلاً على أن النباتات تحتاج إلى السكر.



## Plants and Humans



Plants



Humans

1

### Similarities

Both plants and humans need water and air to grow and survive.

2

### Differences

- » Plants need nutrients and they get them from the soil.
- » Plants make their own food through the photosynthesis process in their leaves.

النباتات تحتاج إلى العناصر الغذائية، وتحصل عليها من التربة، وتصنع غذاءها من خلال عملية البناء الضوئي في الأوراق.

- » Humans need nutrients and energy, and they get them from food to survive and grow.

الإنسان يحتاج إلى العناصر الغذائية والطاقة، ويحصل عليها من الطعام للبقاء والنمو.



## Plant Needs

To grow a healthy plant, we need

### Basic Plant Needs

- 1 Sunlight
- 2 Water
- 3 Carbon dioxide gas

### Not Basic Plant Needs

- 1 Soil
- 2 Oxygen gas
- 3 Sugar
- 4 Forest

» You may notice that **soil wasn't listed as a basic** plant need because some plants don't need soil to grow, such as:

» قد تلاحظ أن التربة لم يتم إدراجها كاحتياجات نباتية أساسية؛ لأن بعض النباتات لا تحتاج إلى تربة لتنمو، مثل:

Plants that grow  
in **water** only.



نباتات تنمو في الماء

Plants that grow  
in **air**



نباتات تنمو في الهواء

Plants that grow  
on **other plants**



نباتات تنمو على النباتات الأخرى

## Plants and Food

» How do the roots, stems, and leaves help the plants to get food?

### Plant Leaves

- » Plants make their own food in their leaves through the **photosynthesis** process.
- » Plant food is a kind of **sugar**, this sugar provides it with the energy needed for growth.



- تصنع النباتات غذاءها في أوراقها من خلال عملية البناء الضوئي.
- غذاء النبات هو نوع من السكر الذي يمدّها بالطاقة اللازمة للنمو.

### Plant Roots and Stem

- » Plant roots absorb **water** and **nutrients** from the soil, and then they pass from the **roots** to the **leaves** through the **stem**.



- تمتص جذور النباتات الماء والعناصر الغذائية من التربة، وتنتقل من الجذور إلى الأوراق عبر الساق.



## Exercises on Activities 1 to 5

### 1 Choose the correct answer:

- 1 All the following structures exist in green plants, except .....  
a. stems                      b. fruits                      c. blood                      d. leaves
- 2 Both plants and humans need ..... to survive.  
a. shelter                      b. carbon dioxide gas  
c. soil                      d. air
- 3 Green plants can absorb nutrients from the .....  
a. water                      b. soil                      c. air                      d. food
- 4 In the absence of ....., plants will die.  
a. oxygen gas                      b. sugar                      c. soil                      d. sunlight
- 5 If you are walking in the garden, you can observe all the plant parts, except the .....  
a. leaves                      b. stems                      c. roots                      d. flowers
- 6 Green plants can make their own food through the ..... process.  
a. respiration                      b. digestion                      c. photosynthesis                      d. thinking
- 7 Manufacturing of the plant food take place inside ..... of the plant.  
a. the leaves                      b. the roots                      c. the stem                      d. all parts
- 8 Green plants and animals are similar in .....  
a. size                      b. structure                      c. growing                      d. moving
- 9 ..... and ..... are from the basic needs of all living organisms.  
a. Soil and air                      b. Water and soil  
c. Air and water                      d. Sunlight and shelter
- 10 Animals need all the following things to grow and survive, except .....  
a. water                      b. soil                      c. shelter                      d. food
- 11 Green plants can survive and grow in .....  
a. water                      b. soil                      c. air                      d. all the previous
- 12 The ..... of a plant helps in the transmission of nutrients and water to the plant leaves.  
a. stem                      b. root                      c. flower                      d. fruit



## 2 Put (✓) or (X):

- 1 All living organisms need water and air to grow and survive. ( )
- 2 The plant's roots help the plants to get its food from the soil. ( )
- 3 All different structures of plants help them survive. ( )
- 4 Oxygen gas is from the natural resources that plants need to make their food. ( )
- 5 The digestive system help humans to get the useful nutrients from food. ( )
- 6 The green plant is the only living organism that can manufacture its own food. ( )
- 7 Shelter and water are necessary for plants to grow. ( )
- 8 Without the soil, plants can't grow even if they obtain water and sunlight. ( )
- 9 Plants can absorb their food from the soil by their roots. ( )
- 10 There are some plants that can grow easily on other plants. ( )
- 11 The liquid produced from the tree sap is considered an evidence that plants need sugar. ( )
- 12 The photosynthesis process is a vital process that all living organisms do to grow. ( )

## 3 Write the scientific term:

- 1 The only living organism that can make its own food. (\_\_\_\_\_)
- 2 A vital process that takes place in green plants to make them survive. (\_\_\_\_\_)
- 3 A part of the plant that absorbs water and nutrients from the soil. (\_\_\_\_\_)
- 4 A part of the plant that is responsible for manufacturing the food of plants. (\_\_\_\_\_)

## 4 Complete the following sentences:

- 1 The green plant consists of \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and sometimes \_\_\_\_\_ or \_\_\_\_\_.
- 2 The plant's roots can absorb \_\_\_\_\_ and \_\_\_\_\_ from \_\_\_\_\_, while the \_\_\_\_\_ of a plant is responsible for making food for the plant.

## • Concept 1 Plant Needs

- 3 All living organisms need air and water to ..... and .....
- 4 ....., ..... and ..... are from the natural resources that the green plant needs.
- 5 Plants need ..... gas and they produce ..... gas through the photosynthesis process.
- 6 The plant's roots can grow in ....., ..... or .....

## 5 Cross out the odd word:

- 1 Green plant – Shelter – Water – Sunlight (.....)
- 2 Animal – Water – Food – Carbon dioxide gas (.....)
- 3 Photosynthesis – Oxygen gas – Carbon dioxide gas – Leaves (.....)
- 4 Nutrients – Digestion – Photosynthesis – Human (.....)

## 6 Classify these words in the following tables:

- 1 Soil – Oxygen gas – Carbon dioxide gas – Sugar – Sunlight – Water

Basic Plant Needs	Not Basic Plant Needs
.....	.....

- 2 Soil – Water – Air – Shelter – Sunlight

Plants Needs	Animals Needs	Animals and Plants Needs
.....	.....	.....

## 7 Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
<ol style="list-style-type: none"> <li>1 A plant</li> <li>2 An animal</li> <li>3 Roots</li> <li>4 Leaves</li> </ol>	<ol style="list-style-type: none"> <li>a. are responsible for making the food of the plant.</li> <li>b. absorb nutrients and water from the soil.</li> <li>c. must move to get its food.</li> <li>d. can get its food by itself.</li> </ol>

1 .....

2 .....

3 .....

4 .....

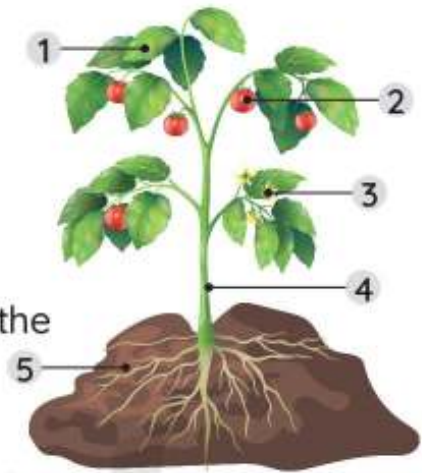


## 8 Study the following figures, then answer the questions:

- 1 The opposite figure represents a green plant, answer the following questions:

(A) Label the following:

- 1 ..... 2 .....  
3 ..... 4 .....  
5 .....



(B) Which part of the plant is responsible for the following:

- 1 Absorption of nutrients: .....  
2 Manufacturing of food: .....  
3 Transmission of nutrients: .....

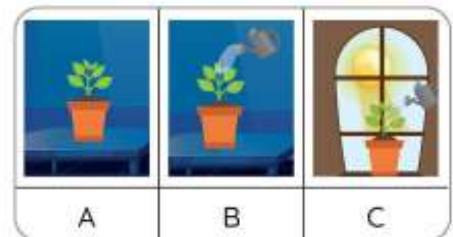
(C) Mention the most basic needs of the plant. ....

- 2 The opposite figure represents a green plant, answer the following questions:

(A) Plant (.....) will grow well and healthy.

(B) Plant (.....) needs sunlight to survive.

(C) Plant (.....) needs sunlight and water to survive



## 9 Give reasons for:

- 1 Plant's roots have great functions.
- 2 Unlike humans and animals, plants can get their food by themselves.
- 3 Soil isn't listed as a basic plant need, while the sunlight is listed as a basic plant need.

## 10 What happens if:

- A plant isn't exposed to sunlight for a few days.



## Activity

6

Investigate Like a Scientist  
Do Plants Need Soil?

## Experiment



» In this activity, you will test your ideas about what the plant needs. You will germinate seeds in wet paper towels and other seeds in soil. Then you will compare their growth.

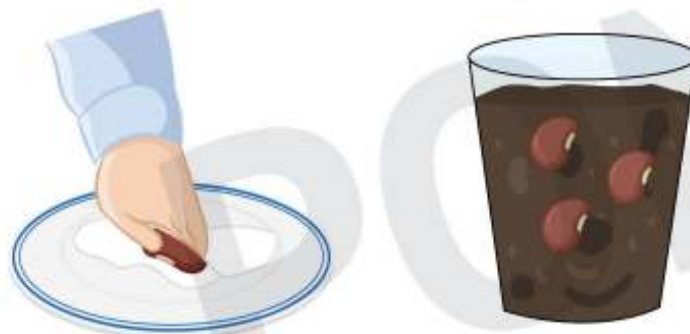
« في هذا النشاط، ستختبر أفكارك حول ما يحتاجه النبات، وسوف تزرع البذور في مناشف ورقية مبللة، وبذوراً أخرى في التربة، ثم تقارن نموها.

### Tools:

Plastic cup (250 mL) – soil – potting – paper towels – seeds or beans  
plastic zipper bags – water – pen or marker – metric ruler

### Steps:

- 1 Use the water to wet the paper towel.
- 2 Place three seeds on the top half of the paper towel. Fold the bottom half of the towel up so that it covers the seeds. Place the paper towels inside the plastic zip bag and seal it.
- 3 Fill the plastic cup with potting soil. Plant the other three seeds in the soil. Water the seeds.
- 4 Label the bag and the cup with your name. Then, place the bag and the cup in a place where they can get sunlight.
- 5 Check the growth of seeds over the next several days. Dampen the paper towel and water the soil as needed.





**Results:****Table (1): Shows the seeds germinated on wet paper towels:**

Day			
Measurement			
Other Observations			

After three days



After a week

**Table (2): Shows the seeds germinated in the soil:**

Day			
Measurement			
Other Observations			

After three days



After a week

**Observations:**

- » The first stages of growth of the seeds in the paper towel are similar to the first stages of the seeds in the soil.
- » The growth of the seeds planted on paper towels is slower than the seeds planted in the soil.

« مراحل النمو الأولى للبذور في المنشفة الورقية تتشابه مع مراحل النمو الأولى للبذور في التربة.

« البذور المزروعة في المنشفة الورقية أبطأ في النمو من البذور المزروعة في التربة.

**Conclusion:**

- » Plants can grow without soil for a while if they have water and sunlight, but after that they will need either soil or an alternative that provides a source of minerals and other essential elements.

« يمكن للنباتات أن تنمو بدون تربة لفترة من الوقت إذا كان لديها الماء وضوء الشمس، لكنها في النهاية ستحتاج إما إلى التربة أو إلى بديل يوفر مصدرًا للمعادن والعناصر الأساسية الأخرى.



## Activity

7

Investigate Like a Scientist  
Sunlight: A Basic Need

## Experiment



» In this activity, you will test some of your ideas about how plants grow in the light and in the dark.

« في هذا النشاط، ستختبر أفكارك حول كيف ينمو النبات في ضوء الشمس وفي الظلام.

### Tools:

Plastic cups (250 mL) – soil – potting – seeds or beans  
water – pen or black permanent marker

### Steps:

- 1 Use the permanent marker to write your name on the cups and label the cups **A** and **B**.
- 2 Add soil to your cups. Place the bean seeds on the soil, one per cup, and cover the seeds with about 2 centimeters of soil. Add the same amount of water to each cup to moisten the soil.
- 3 Place cup **A** where it will receive light and place cup **B** in the dark.



- 4 Use the table that follows to record data. Collect information about your plants over a period of 5-10 days, this will help you determine how important the role of sunlight is in the growth of plants.
- 5 Record the date each time you make observations. Make sure you are consistent about what you are observing. For example, if you are measuring height, do it with both cups, every time.



## Results:

Day	1	2	3	4
Cup (A) - Light				
Cup (B) - Darkness				

## Observations:

## The Plant in Cup (A)

## In the light

- Its height reaches 6 cm.
- It has more number of leaves.
- The color of the leaves is green.



نما النبات الذي تعرض إلى الضوء حتى أصبح طوله ٦ سم، وأصبح لديه عدد أكثر من الأوراق الخضراء.

## The Plant in Cup (B)

## In the dark

- Its height reaches 2 cm.
- It has less number of leaves.
- The color of the leaves is not green.



نما النبات الموجود في الظلام حتى أصبح طوله ٢ سم فقط، وأصبح لديه عدد أوراق أقل، ولونها ليس أخضر.

## Conclusion:

» Sunlight is one of the basic needs of plants to survive and grow.

## School Book Questions



1- What are the basic needs of plants?

Plants need light, water, air, and nutrients.

2- Explain the importance of light in the process of plant growth.

The plant exposed to light grows well because it has received abundant food, while the plant that has not been exposed to light does not grow well because it has received less food.



## Activity 8

Analyze Like a Scientist  
Plant Structure

### Plant Needs

- » All living organisms have basic needs that they must meet to survive.
- » Humans, animals and plants need **water** and **air** to survive.
- » Plants and humans are different in the **way of getting food**.

• What do humans and plants need to grow and survive?

#### Plants

- » Plants use sunlight to make their own food from air and water.



« تمتص النباتات أشعة الشمس؛ لتصنع غذاءها من الهواء والماء.

#### Humans

- » Humans get their food from plants and animals

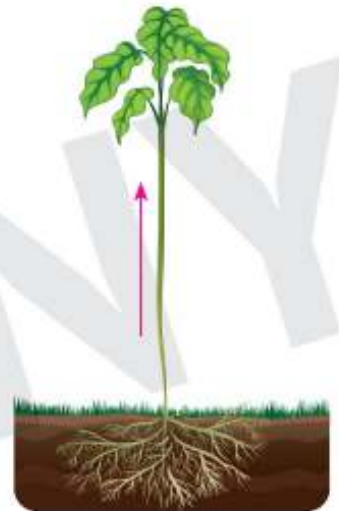


« يحصل الإنسان على الغذاء من خلال النباتات والحيوانات.

### Plant Structure

- » The plant has a **system** that helps it to absorb **water** and **nutrients** from the soil and deliver them to all parts of the plant.

« يحتوي النبات على نظام نقل يساعده على امتصاص الماء والعناصر الغذائية من التربة وتوصيلهما إلى كل أجزاء النبات.





## Leaves

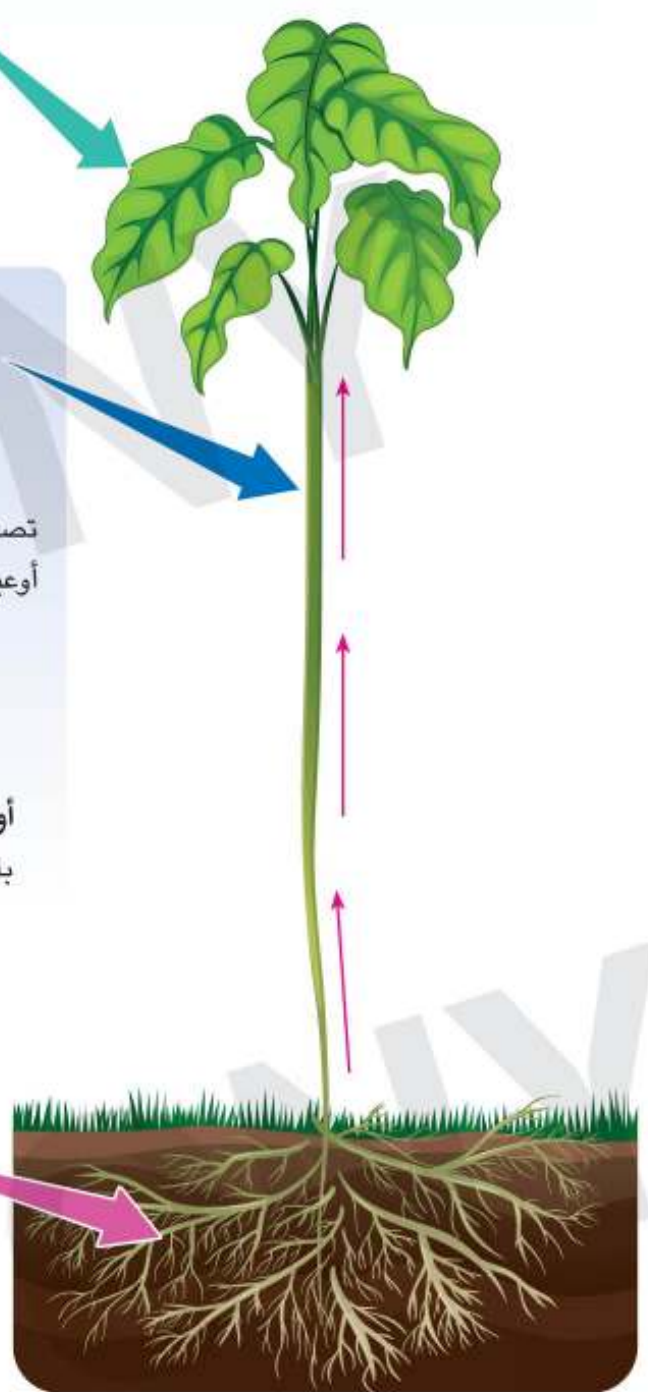
- Leaves collect sunlight.
- The air that the plant needs enters the leaf through the **stomata**.  
تمتص الأوراق أشعة الشمس. يمر الهواء الذي يحتاجه النبات من خلال فتحات بالأوراق تُسمى بالثغور.
- **Stomata:** They are tiny openings that allow air that the plant needs to move into the leaves. **الثغور:** فتحات صغيرة في الأوراق تسمح بمرور الهواء.

## Stem

- Water and nutrients move up the plant's stem through tubes called **vessels** or **xylem**.  
تصعد العناصر الغذائية والماء عبر أنابيب (أوعية) يُطلق عليها أوعية الخشب.
- **Xylem (vessels):**  
They are smaller vessels that connect the **stem** to the **leaves**.  
أوعية الخشب: أنابيب داخل الساق مهمتها ربط الساق بالأوراق.

## Roots

- Plant's roots absorb water and nutrients from the soil.  
تمتص جذور النبات الماء والعناصر الغذائية من التربة.





## Activity 9

Observe like a Scientist  
Parts of a Plant

### Parts of a Plant:

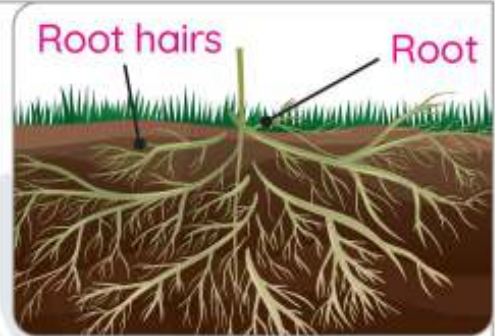
- » Even though all plants look different, they have similar parts.
- » The plant consists of **roots**, **stems** and **leaves** in which each part of the plant does a specific function

#### 1 Plant's Roots:

- » The roots of the plant perform some very important functions.

##### Plant's roots functions:

- 1 Roots anchor (fix) the plant in the soil.
- 2 They absorb water and nutrients from the soil, which are needed to make food.



##### وظيفة الجذور:

- 1 تثبيت النبات في التربة.
- 2 مسئولة عن امتصاص الماء والعناصر الغذائية اللازمة من التربة لصنع الغذاء.

- » Plant roots have hair-like features called "**root hairs**".

##### Roots hairs functions:

- 1 Root hairs increase the amount of water and nutrients the plant can take in.
- 2 Root hairs allow nutrients to pass from the soil to the root.



الشعيرات الجذرية: زوائد تشبه الشعر تمتد من الطبقة الخارجية للجذور.

##### وظيفةها:

- 1 تزيد من كمية الماء والعناصر الغذائية التي يمتصها النبات.
- 2 تنقل العناصر الغذائية من التربة إلى الجذر.



## 2 Plant's Stem:

Functions:

- 1 They transport nutrients to the rest of the plant through the tubes called vessels.
- 2 Stems give the plant support.

الوظيفة:

- 1 تنقل العناصر الغذائية لكل أجزاء النبات عن طريق أنابيب تُسمى بالأوعية.
- 2 هي الجزء الداعم لجميع النباتات.



## Types of Stems

## 1 Wood Stem

Tree trunks and shrubs



١- ساق خشبية:

مثل جذوع الأشجار والشجيرات.

## 2 Upright Stem

Most flowers



٢- ساق رأسية مستقيمة:

مثل سيقان الأزهار.

## 3 Climb Stem

Vines



٣- ساق متسلقة:

مثل العنب.

## 4 Tubers

(extend underground)

Potato plant



٤- الدرنات (ساق تمتد تحت الأرض):

مثل البطاطس.

## 5 Runners

Run along the ground and help to form new plants.



٥- ساق مدادة:

هي ساق تمتد على الأرض، وتساعد في تكوين نباتات جديدة.

### 3 Plant's Leaves:

#### Functions:

- 1 All leaves have tubes running through them called "**xylem**".  
Xylem helps carry water from the roots to the stem and leaves.
- 2 The most important function of the leaves is to **make food** through the **photosynthesis process** and in order to carry out this process, it needs **water**, **carbon dioxide** and **sunlight**.



#### الوظيفة:

- 1 تحتوي الأوراق على أنابيب تُسمى أوعية الخشب، وهي أوعية مسنولة عن نقل الماء من الجذور إلى ساق وأوراق النبات.
- 2 أهم وظائف الأوراق هو صنع الغذاء من خلال عملية البناء الضوئي، ولكي تقوم بتلك العملية فإنها تحتاج إلى الماء وغاز ثاني أكسيد الكربون وضوء الشمس.

### Types of Leaves

- 1 Some are narrow and look like needles (as spine)



• أوراق صغيرة تشبه الإبر كأوراق شجرة الصنوبر.

- 2 Other leaves are flat and much wider

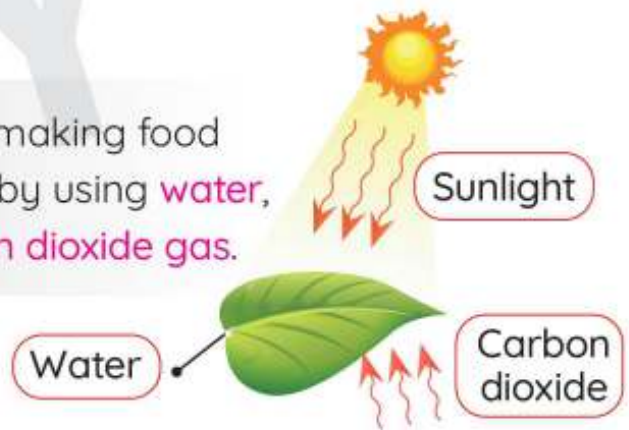


• أوراق مسطحة عريضة كأوراق نباتات الظل.



## Photosynthesis

It is the process of making food inside **plant leaves** by using **water**, **sunlight** and **carbon dioxide gas**.



### Necessary Factors

1 Sunlight

2 Carbon dioxide gas

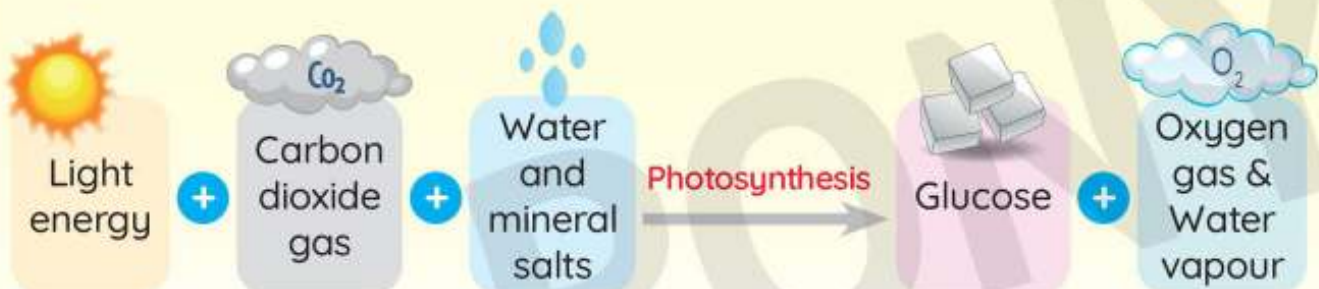
3 Water and mineral salts



### Products

a Glucose

b Oxygen gas  
Water vapour

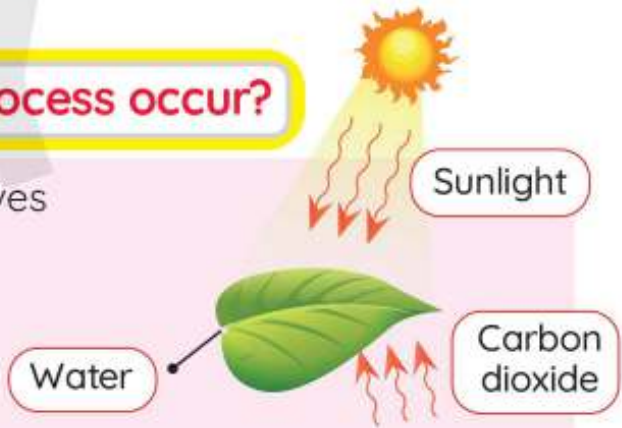


## How does the photosynthesis process occur?

» Leaves contain chlorophyll, which gives them their green color.

» Chlorophyll captures energy from sunlight.

» Green leaves use the light energy from the sun to combine the carbon dioxide from the air with water to manufacture nutrients (such as sugars, starches, fats, and proteins) that the plant needs to live.



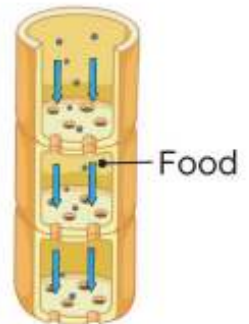
« تحتوي أوراق النبات على (الكوروفيل) الذي يعطيها اللون الأخضر. يمتص الكلوروفيل الطاقة من ضوء الشمس.

تستخدم أوراق النبات تلك الطاقة في اتحاد غاز ثاني أكسيد الكربون مع الماء لإنتاج المواد الغذائية التي يحتاجها النبات؛ ليظل على قيد الحياة، مثل: (السكريات والنشويات والدهون والبروتين).

A set of tubes that transport the food materials downward, from the leaves to the other parts of the plant.

**Phloem**

**أوعية اللحاء:** أنابيب مسنولة عن نقل المواد الغذائية من الأوراق إلى أجزاء النبات الأخرى.



» What is the importance of the photosynthesis process?

### For plants

» Producing food for the plant.

### For other living organisms

» Producing oxygen that animals and humans need to breathe.

### Important Note:

- Life on Earth without plants would be impossible.







## Activity 10

Investigate Like a Scientist  
Up the Stem

### Experiment



» In this activity, you will test some of your ideas about how plants move water. You will investigate what transport vessels in a plant look like and how they work to help a plant stay alive.

« في هذا النشاط، سوف تختبر بعض أفكارك حول كيفية نقل النباتات للمياه. ستتحقق من شكل أوعية النقل في النبات وكيف تعمل لمساعدة النبات على البقاء على قيد الحياة.

#### Tools:

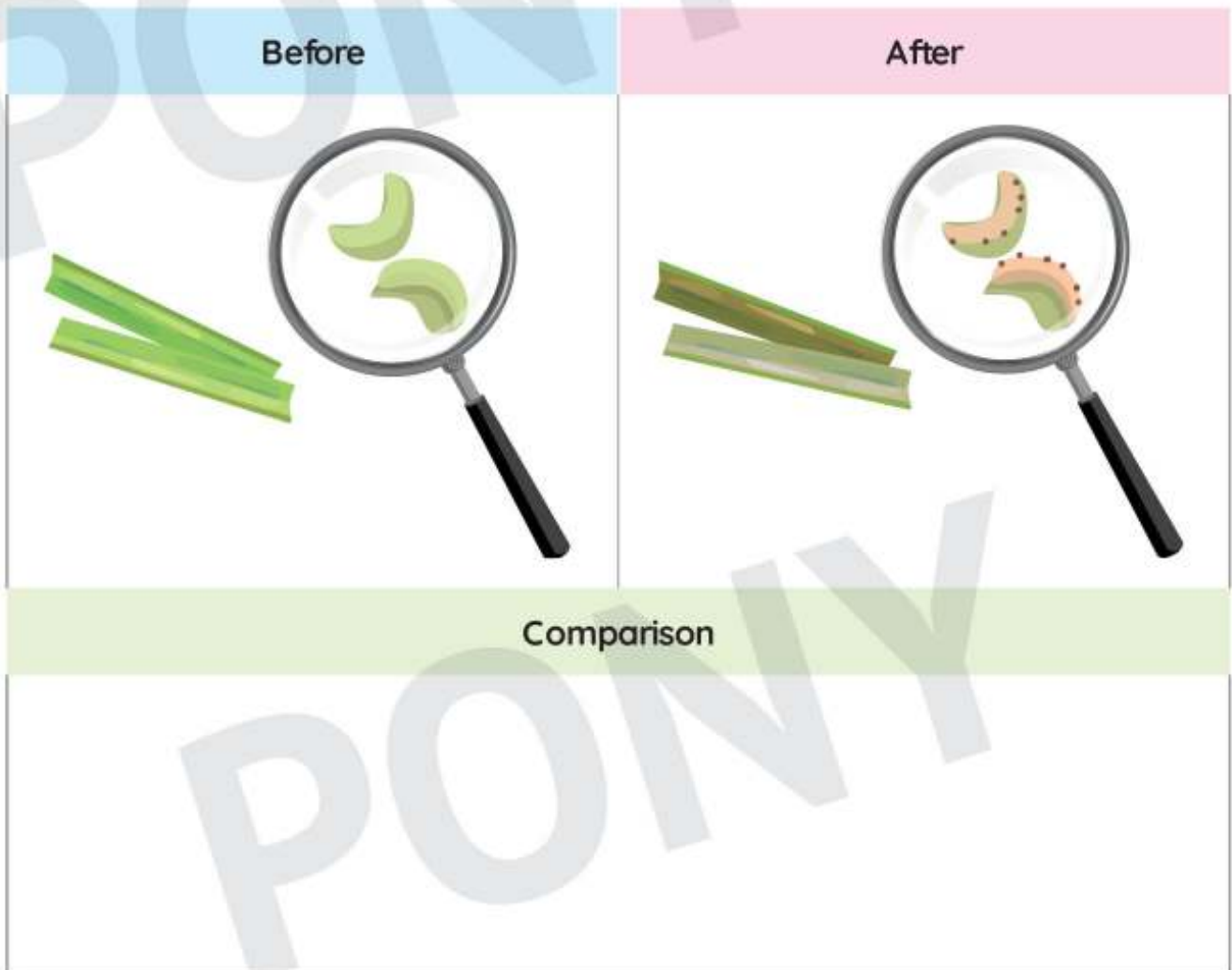
- Celery stalk
- White carnation flowers (optional)
- Plastic cups (250 mL)
- Food coloring
- Scissors
- Hand lens
- Water

#### Steps:

- 1 Select a stalk of celery. Examine the stem and any leaves closely. Record observations about how the stem looks in the “Before” section of the data table.
- 2 Fill a cup with water. Add food coloring to the cup of water. Snip about two centimeters off the bottom of the stalk and place it in the water.
- 3 Leave the stalk in the water cup and set aside where it will not be disturbed until the next day.
- 4 Observe the stalk. Record your observations.
- 5 Compare the actual outcome with your prediction.
- 6 Follow step-by-step directions given by the teacher to dissect the stalk.
- 7 Record detailed notes and drawings. Be sure to label the **xylem**.



### Results:



### Observations:

- » When a celery stalk is placed in a glass of colored water, the wood color will change to the color of the water in the cup.

« عند وضع ساق الكرفس في كوب من الماء الملون، سيتغير لون نسيج الخشب إلى لون الماء الموجود في الكوب.

### Conclusion:

- » Xylem helps in carrying water and nutrients up from the soil to the plant's leaf.

« تقوم أوعية الخشب بنقل المياه والعناصر الغذائية لأعلى من التربة إلى أوراق النبات.





## Exercises on Activities 6 to 10

### 1 Choose the correct answer:

- 1 The plant placed in a dark room for a week will have .....  
 a. green leaves   b. long stem   c. strong roots   d. a few leaves
- 2 Without ....., the green plant will die quickly.  
 a. oxygen gas   b. soil   c. sunlight   d. sugar
- 3 Carbon dioxide gas enters the plant leaf through the .....  
 a. chlorophyll   b. stomata   c. xylem   d. phloem
- 4 The ..... in a plant are responsible for fixing the plant in the soil.  
 a. leaves   b. stems   c. roots   d. flowers
- 5 The ..... in a plant support the plant and are responsible for the transmission of nutrients inside the plant.  
 a. leaves   b. stems   c. roots   d. flowers
- 6 The ..... is/are small vessels that carry water and nutrients upward.  
 a. chlorophyll   b. stomata   c. xylem   d. phloem
- 7 Root hairs allow nutrients to transfer from the ..... to the .....  
 a. soil – stem   b. stem – leaf   c. roots – soil   d. soil – roots
- 8 Photosynthesis process requires all the following natural resources, except .....  
 a. water   b. sunlight  
 c. oxygen gas   d. carbon dioxide gas
- 9 The ..... absorb(s) the sunlight of the sun during photosynthesis process.  
 a. chlorophyll   b. stomata   c. xylem   d. phloem
- 10 Photosynthesis process is very necessary for .....  
 a. plants only   b. humans only   c. animals only   d. living organisms
- 11 ..... is responsible for the transmission of food from the leaves to all plant parts.  
 a. Chlorophyll   b. Stomata   c. Xylem   d. Phloem



## Concept 1 Plant Needs

- 12** All the following happens during the photosynthesis process, except ..... .  
**a.** chlorophyll absorbing sunlight    **b.** stomata absorbing carbon dioxide  
**c.** xylem carrying nutrients from the leaf  
**d.** phloem carrying food from the leaf
- 13** \_\_\_\_\_ have wood stems, while \_\_\_\_\_ have tubers stems.  
**a.** Shrubs - vines                                 **b.** Shrubs - potatoes  
**c.** Potatoes - trees                               **d.** Vines - potatoes
- 14** During photosynthesis process, oxygen gas is ..... .  
**a.** absorbed                 **b.** digested                 **c.** released                 **d.** inhaled

**2 Put (✓) or (X):**

- 1 The plant grows in the soil faster than on the paper towel. ( )
- 2 The plant that is left in the dark has green leaves. ( )
- 3 Sunlight is very necessary for a plant to survive and grow. ( )
- 4 Plants and animals are similar in the way of getting their food. ( )
- 5 All non-living things have basic needs to survive. ( )
- 6 Xylems are smaller tubes that connect the stem to the leaf. ( )
- 7 Stomata are responsible for the absorption of sunlight. ( )
- 8 Chlorophyll is responsible for the green color of the plant. ( )
- 9 Root hairs allow nutrients to move directly from the soil to the stem. ( )
- 10 Vines have upright stems and are considered from tubers. ( )
- 11 Potato plants have tuber roots. ( )
- 12 Xylem allows nutrients to move upward inside the plant. ( )
- 13 The spine has wider and flat leaves to absorb more sunlight. ( )
- 14 Oxygen gas is released from photosynthesis process as a waste material for the plant. ( )
- 15 Photosynthesis process takes place inside the plant's leaves. ( )
- 16 Phloem transfers glucose from the leaf to other plant parts. ( )
- 17 Without the sun, all living organisms will die. ( )

**3 Write the scientific term:**

- 1 A structure inside the plant's leaves that is responsible for its green color. (.....)
- 2 A structure inside the plant's leaves that is responsible for allowing air to enter it. (.....)
- 3 A structure inside the plant that carries nutrients upward. (.....)
- 4 A structure inside the plant that carries food to all plant cells. (.....)



#### 4 Complete the following sentences:

- 1 The growth of seeds planted on paper towels is ..... those planted in the soil.
- 2 The height of a plant that is placed in the light is ..... that placed in a dark room.
- 3 In the absence of ....., the leaf of the plant will lose its green color.
- 4 ....., ..... and ..... are essential elements to perform photosynthesis.
- 5 ..... can make their own food inside them, while ..... and ..... can't.
- 6 Plant's roots absorb ..... and ..... from the soil.
- 7 ..... are smaller tubes that carry nutrients upward the plant, while ..... carries the food from the ..... to other plant parts.
- 8 The stomata exist in ..... and they absorb ..... from the air during photosynthesis.
- 9 Root hairs allow water and nutrients to pass from the ..... to the .....
- 10 Shrubs have ..... stems, while ..... have tuber stems.
- 11 The spine has ..... leaves that look like .....
- 12 The absorption of sunlight inside the plant's leaf is the function of .....
- 13 Green plants use the ..... energy obtained from the sun to combine with ..... and ....., to produce ..... and release ..... in the air.
- 14 Oxygen gas is considered a wasted material for ....., but ..... and ..... need it to survive.

#### 5 Cross out the odd word:

- 1 Plant's leaf - Root hair - Chlorophyll - Stomata (.....)
- 2 Green plant - Water - Sunlight - Carbon dioxide gas - Oxygen gas (.....)

#### 6 Choose from column (A) what suits it in column (B):

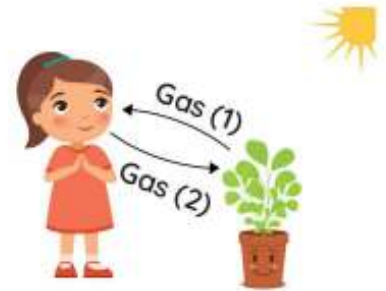
Column (A) Structure inside the plant	Column (B) Function
<ol style="list-style-type: none"> <li>1 Chlorophyll</li> <li>2 Phloem</li> <li>3 Stomata</li> <li>4 Xylem</li> <li>5 Root hairs</li> </ol>	<ol style="list-style-type: none"> <li>a. Transmission of nutrients and water to the plant's leaf.</li> <li>b. Allowing the needed air to enter the leaf.</li> <li>c. Absorbing the sunlight of the sun.</li> <li>d. Allowing nutrients to pass from the soil to the plant's roots.</li> <li>e. Transmission of food from the plant's leaf.</li> </ol>

1 ..... 2 ..... 3 ..... 4 ..... 5 .....

## 7 Study the following figures, then answer the questions:

- 1 The opposite figure represents a green plant, complete the following sentences:

- a. Gas (1) represents ..... gas that is considered wasted material for ..... and essential material for the .....
- b. Gas (2) represents ..... gas that combines with \_\_\_\_ in the presence of \_\_\_\_ to produce the plant food.



- 2 Adam traveled with his family for a week, but he left this plant in the dark room:

Adam observed that:

- a. The number of leaves ..... (increases - decreases)
- b. The leaf lose its ..... color. (green - yellow)



- 3 The opposite figure represents a plant's leaf, complete the following sentences:

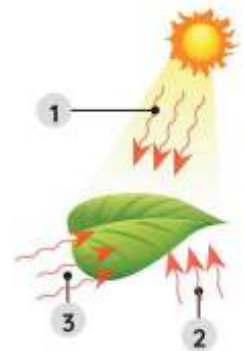
The opposite figure represents ..... process.

The needed three essential elements:

Element 1 represents ..... that is absorbed by .....

Element 2 represents ..... that is absorbed by .....

Element 3 represents ..... that is carried by the ..... to reach the leaf.



## 8 Give reasons for:

- 1 Green plants grow better in the soil than on paper towels.
- 2 Life is impossible without plants.
- 3 Plants and humans are different in the way of getting their food.

## 9 What happens if:

- 1 You leave a plant in a dark room for five days.
- 2 A celery stalk is placed in a glass of colored water.





## Activity 11

### Analyze Like a Scientist Comparing Plant and Human Systems

» How do humans and plants obtain the energy and gases needed for survival and growth?

- Comparing plant and human systems and their need for energy: Both of them need energy and gases from the air to survive and grow.

#### a Getting Energy

##### Plants

» Plants can get energy and manufacture their own **glucose**, through a process called **photosynthesis**.



» يحصل النبات على الطاقة والجلوكوز من خلال عملية البناء الضوئي.

##### Humans

» People must eat food throughout the day for energy.

» Glucose and other nutrients enter our bodies through the digestive system.



» As we chew and swallow our food, **nutrients** are absorbed into the **blood**.

» يحصل الإنسان على الطاقة عندما يتناول الطعام.

» يدخل الجلوكوز والعناصر الغذائية الأخرى إلى أجسامنا من خلال الجهاز الهضمي.

» عندما نمضغ ونبتلع طعامنا، يتم امتصاص العناصر الغذائية في الدم.

#### b Getting Gases

- Both plants and humans must take in gases from the air.

##### Plants

» Gases enter plants through the **leaves**.



» تدخل الغازات إلى النباتات من خلال الأوراق.

##### Humans

» Air enters the human body through our **mouth** and **nose** and travels to the **lungs**, where oxygen is absorbed into circulating blood.



» يدخل الهواء إلى جسم الإنسان من خلال الفم والأنف ويسافر إلى الرئتين، حيث يتم امتصاص الأكسجين. في الدورة الدموية.

## Comparing Plant and Human Systems

### 1 Human Circulatory System:

**Structure:** It consists of the **heart** and **blood vessels**.

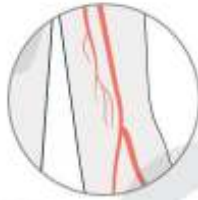
#### **Blood vessels:**

They are tubes that transport **nutrients** and **oxygen** to the cells and organs.

**الأوعية الدموية:** عبارة عن أنابيب مسئولة عن نقل العناصر الغذائية والأكسجين إلى خلايا الجسم وأعضائه.



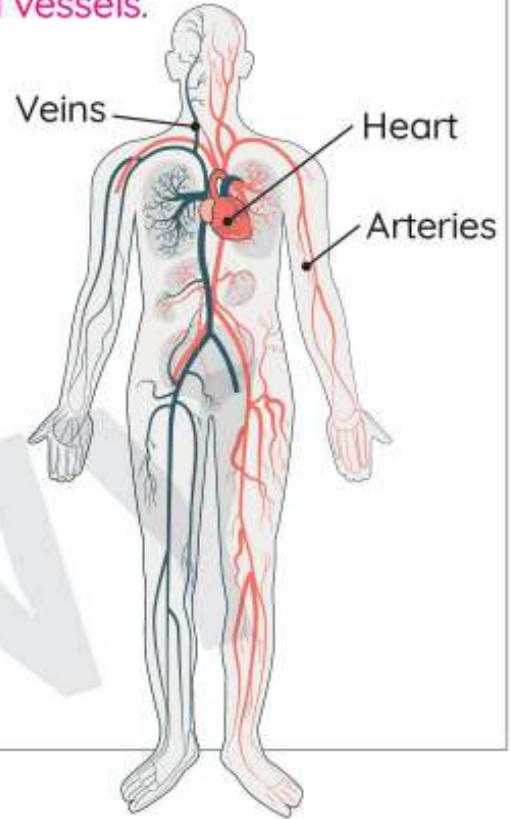
Veins



Arteries



Heart



### Important Notes:

- There are **two** different types of blood vessels in the human circulatory system called **arteries** and **veins**.

هناك نوعان مختلفان من الأوعية الدموية في الجهاز الدوري للإنسان، هما: الشرايين والأوردة.



- Blood moves in only **one direction** in a human's veins or arteries.

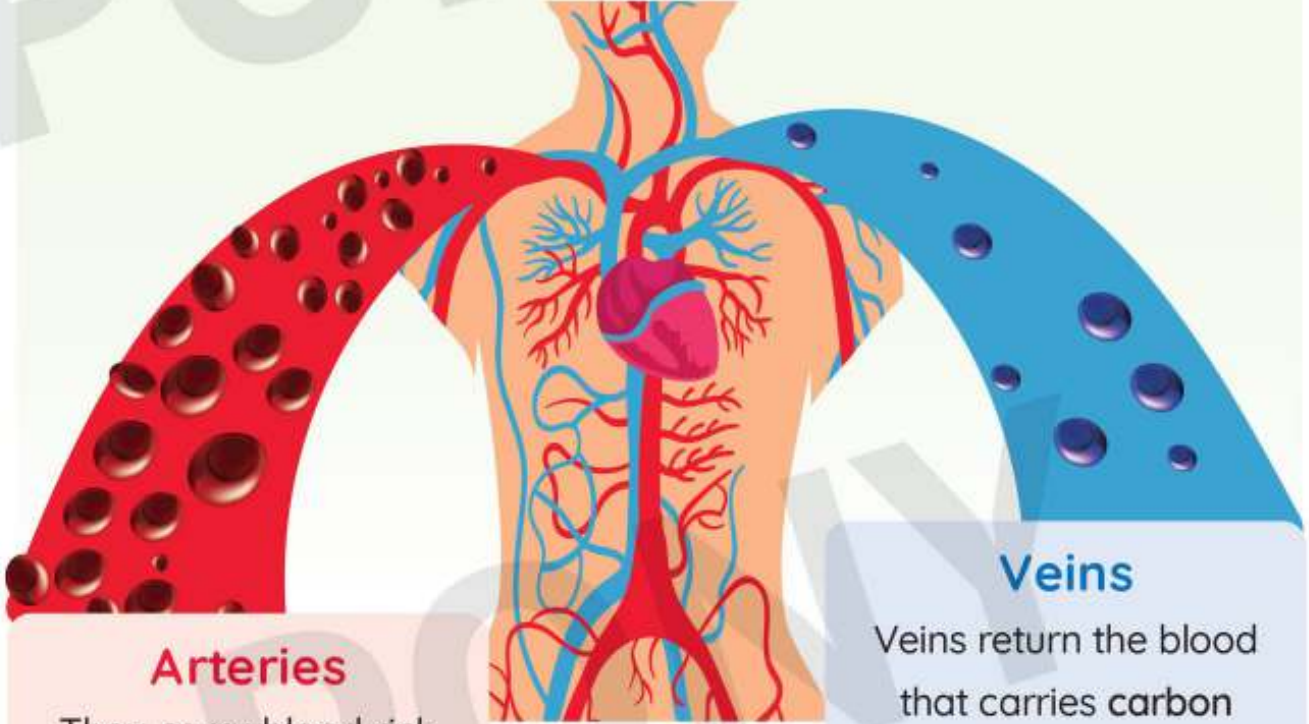
يتحرك الدم في اتجاه واحد عبر أوردة الإنسان أو شرايينه.

- You can see your veins and arteries through your skin on your hands or arms.

إذا نظرت إلى يديك يمكنك ملاحظة شكل الأوردة والشرايين الموجودة تحت الجلد.







### Arteries

They carry blood rich with oxygen and glucose away from the heart to organs, muscles, bones, and cells so that the body can grow and heal.

### الشرايين

تقوم بنقل الدم الغني بالأكسجين والجلوكوز بعيداً عن القلب إلى الأعضاء والعضلات والعظام والخلايا؛ حتى يتمكن الجسم من النمو والشفاء.

### Veins

Veins return the blood that carries carbon dioxide and is low in nutrients and oxygen back to the heart for a recharge.

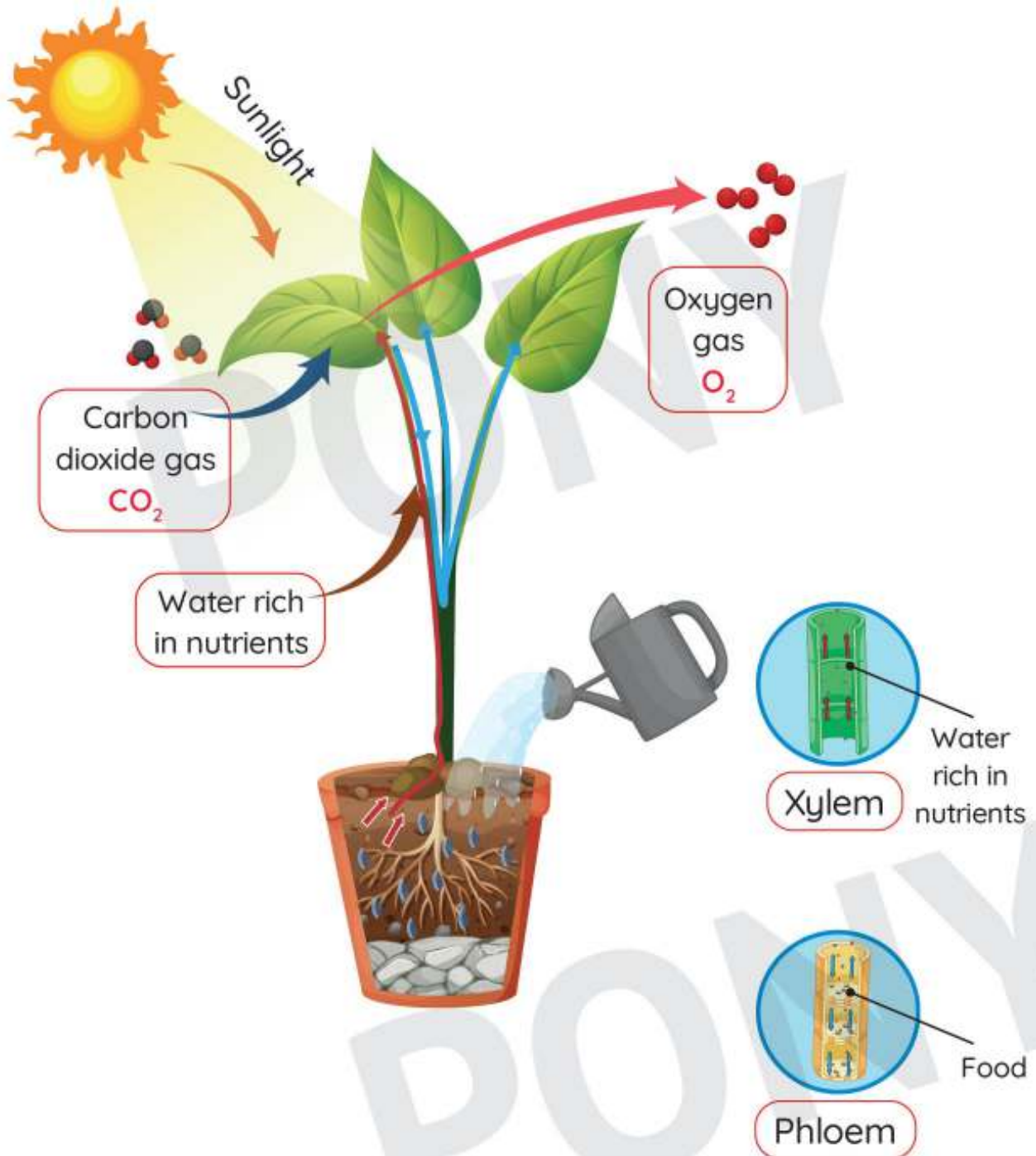
### الأوردة

تعيد الأوردة الدم الذي يحمل ثاني أكسيد الكربون والمنخفض في العناصر الغذائية والأكسجين إلى القلب؛ ليتم تزويده بالأكسجين.

## 2 Plants Transport System:

Like the human circulatory system, the **plant's transport system** transports **water and nutrients** in **one direction** within the vessels (tubes) between the plant parts.

مثل نظام الجهاز الدوري للإنسان، يقوم نظام النقل في النبات بنقل العناصر الغذائية الهامة في اتجاه واحد داخل الأوعية (الأنابيب) بين أجزاء النبات.



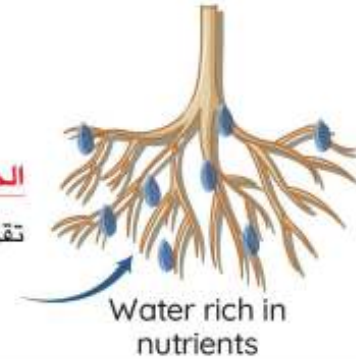


## Transfer of Water and Nutrients within the Plant

### Roots

- They absorb **water** and **nutrients** from the soil and send them to the leaf.

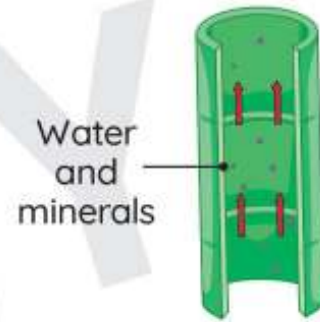
**الجزور:**  
تقوم بامتصاص الماء والعناصر الغذائية من التربة وترسلها لورقة النبات.



### Xylem

- Transport **nutrient-rich water** up to the plant's leaves.

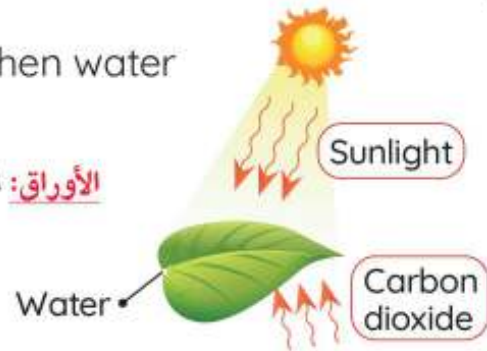
**أوعية الخشب:**  
تنقل المياه الغنية بالعناصر الغذائية إلى أعلى لأوراق النبات.



### Leaves

- They start manufacturing **glucose** when water reaches them.

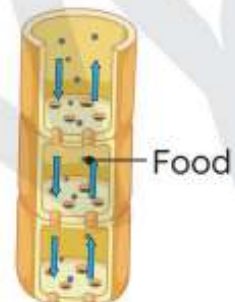
**الأوراق:** تعمل الأوراق على تصنيع الجلوكوز عند وصول الماء إليها.



### Phloem

- Once energy production is complete, the phloem carries the **glucose** downward to all plant parts.

**الحاء:** يقوم بحمل الجلوكوز عند اكتمال عملية إنتاج الطاقة خلال أنابيب إلى الأجزاء السفلية للنبات.

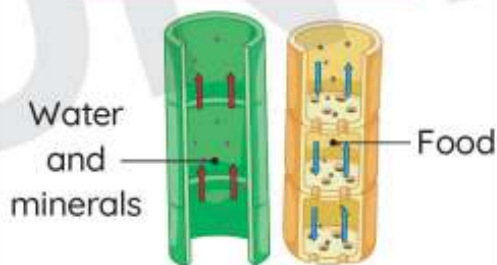


P.O.C

## Plant Transport System

## Human Circulatory System

Picture



Similarities

- 1 They are similar in **function**, which is to transport nutrients and gases to all body parts.
- 2 They transport nutrients and gases in one direction only.

« يتشابهان في الوظيفة وهي نقل العناصر الغذائية والغازات اللازمة للحياة إلى جميع أجزاء الجسم.

« ينقلان العناصر الغذائية والغازات في اتجاه واحد فقط.

Differences

It consists of:

- 1 Xylem
- 2 Phloem

It consists of:

- 1 Arteries
- 2 Veins

## Plant Transport System

## Similarities

## Human Circulatory System

## Optional Activity

Go Online on



Activity 12 Evaluate Like a Scientist  
Obtaining Materials





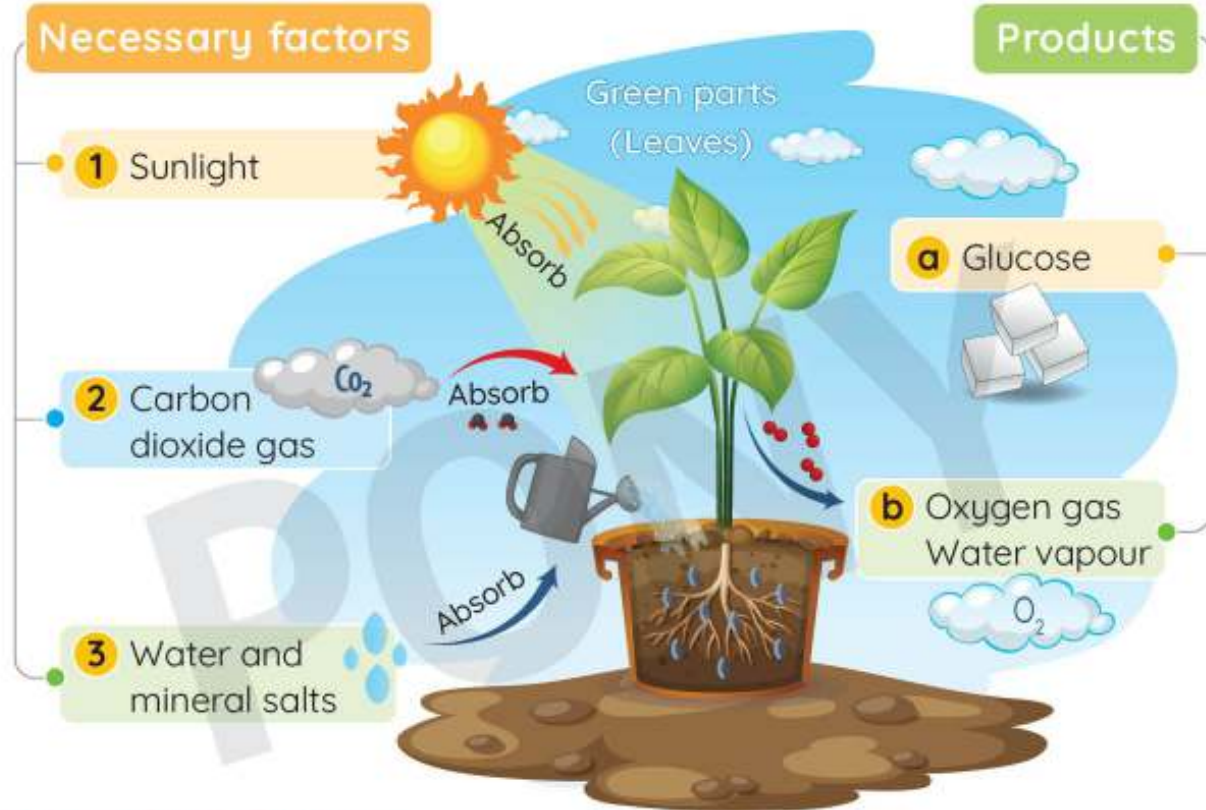


## Activity 13

Analyze Like a Scientist  
Plant Food

### Plant Food

- » Plants are able to manufacture their own food in **photosynthesis process** from materials that they obtain from their environment.



#### Photosynthesis Process:

- 1 **Plant's roots** absorb water and nutrients from the soil.
- 2 **Xylems** transport water rich in nutrients up to the leaves.
- 3 **Chlorophyll** captures the light energy from the sun.
- 4 In the plant leaves, water combines with carbon dioxide in the presence of sunlight to produce glucose.
- 5 **Phloem** moves glucose from the leaves to the other plant parts.

**الجذور:** تقوم بامتصاص الماء والعناصر الغذائية من التربة وترسلها للأوراق لصناعة الغذاء.

**أوعية الخشب:** تنقل المياه الغنية بالعناصر الغذائية إلى أعلى النبات إلى الأوراق.

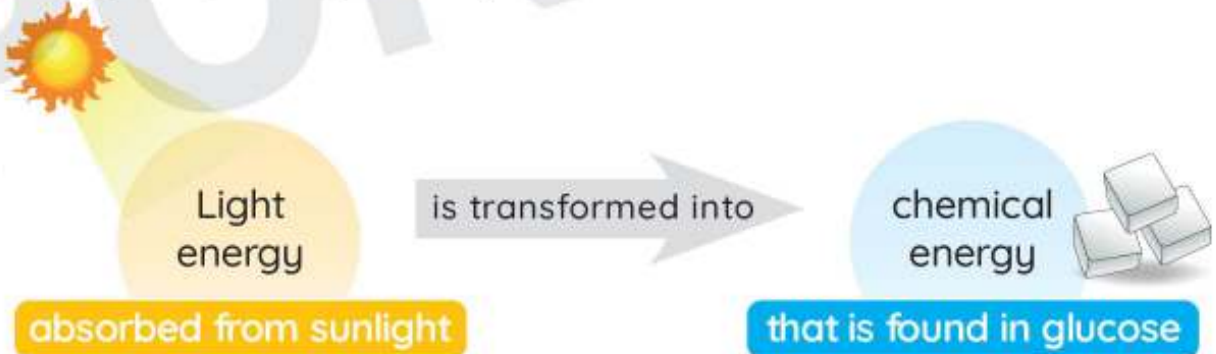
**الكلوروفيل:** يقوم بامتصاص الطاقة الضوئية من الشمس.

**في الأوراق:** يتحد غاز ثاني أكسيد الكربون مع الماء في وجود ضوء الشمس لإنتاج الجلوكوز.

**اللحاء:** يقوم بحمل الجلوكوز خلال أنابيب إلى جميع أجزاء النبات الأخرى.

## Energy Transformation in Photosynthesis Process

» During the photosynthesis process,



### Glucose as a source of energy for plants:

» Plant cells use this glucose as a source of energy to **live** and **grow**.

### Products of photosynthesis:

- » As the plant cells use glucose, they release **oxygen** and **water** in the air.
- » These products are considered **waste materials for the plant**.
- » Other living organisms, such as animals and humans depend on the oxygen gas that plants release during this process of food production.

### Important Notes:

- **Photosynthesis process** takes place in the **plant's leaves**.
- Energy can be **transformed** from one form to another.
- **Oxygen gas** is considered a **waste material for plants**, but it is considered from the **basic needs for human and animals**.



### Optional Activity

**Activity 14** Observe Like a Scientist  
Leaves and Food Production

Go Online on



Egyptian Knowledge Bank  
بنك المعرفة المصري





## Activity 15

### Observe Like a Scientist Flowers and Seeds

» You learned that plants use specific structures that help them get food, grow and survive.

» Flowers of plants have different **shape, size, and color**.

» Some plants, such as **grasses**, have very small flowers that are hardly noticeable.

» Some flowers **are not** very colorful.



« تختلف الأزهار في أشكالها وأحجامها وألوانها.

بعض النباتات مثل الأعشاب أزهارها صغيرة جدًا تصعب ملاحظتها.

بعض النباتات الأخرى أزهارها ليست زاهية الألوان.

### Flower Function (Job):

» All flowers have the same main job: to help the plants reproduce.

**Plant reproduction** • It is the process of making new plants.

**Flowers** • They are the reproductive parts of many plants.

### Sunflowers

The small dark-colored objects in the center of the flower are seeds.

If these seeds receive air, water, and the correct temperature, they can grow into a new plant.

**زهرة عباد الشمس:**

تمتلك بذورًا صغيرة داكنة في وسط الزهرة يمكن أن تنمو وتحول إلى نبات جديد إذا توفرت لها عوامل الماء والهواء ودرجة الحرارة المناسبة.










## Activity 16

### Investigate Like a Scientist Seed Dispersal

- » Seeds shapes and sizes vary from a plant to another.  
تختلف أشكال وأحجام البذور من نبات لآخر.
- » The way of seed dispersal is determined by the shape and size of the seed, as in the following examples:  
طريقة انتشار البذور يحددها شكل وحجم البذرة كما بالأمثلة التالية:

Seed	Figure	The Way of Seed Dispersal
<b>Coconut Seed</b> بذرة جوز الهند		<b>Water</b> because it is <b>hollow</b> from the inside, and floats on the surface. <b>طريقة الانتشار:</b> الماء؛ لأنها مجوفة من الداخل، وتطفو على السطح.
<b>Maple Seed</b> بذرة القيقب		<b>Winds</b> because it has <b>wing-like</b> structures that help it move with the help of the wind. <b>طريقة الانتشار:</b> الرياح؛ لأنها تمتلك تراكيب تشبه الجناح تساعد على الحركة بمساعدة الرياح.
<b>Tomato Seed</b> بذرة الطماطم		<b>Organisms</b> that eat the fruit and spread the seeds. Apple seeds can also be distributed in this way. <b>طريقة الانتشار:</b> الكائنات الحية التي تأكل الثمرة وتنتشر البذور، ويمكن نشر بذور التفاح أيضًا بهذه الطريقة.
<b>Burdock Seed</b> بذرة الأرقطيون		It has <b>spines</b> that help it <b>stick</b> to living organisms, like animal fur and human clothing to spread from one place to another. <b>طريقة الانتشار:</b> بها أشواك تساعد على الالتصاق بالكائنات الحية، مثل: فرو الحيوانات وملابس الإنسان؛ لتنتشر من مكان لآخر.
<b>Dandelion Seed</b> بذرة الهندباء		<b>Wind</b> because of its <b>parachute-like structure</b> , which enables it to spread in the presence of wind. <b>طريقة الانتشار:</b> الرياح؛ بسبب تركيبها الذي يشبه الباراشوت الذي يُمكنها من الانتشار في وجود الرياح.



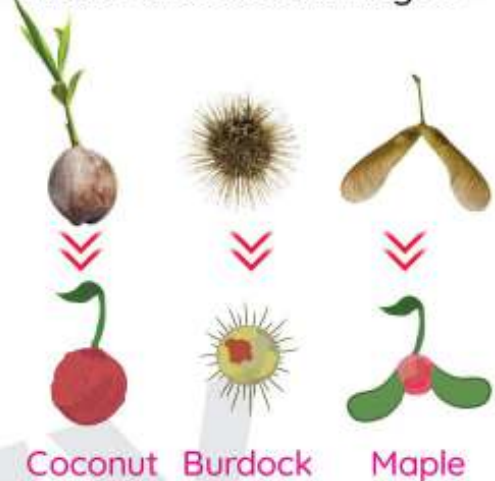
## Experiment



### Steps:

- 1 Notice the different types of seeds and then think of ways to help these seeds move from one place to another using a **bowl of water**, blowing air or a **piece of carpet**.
- 2 Record your notes.
- 3 Draw a model of imaginary seeds, and then test your model using one of the following methods:  
water, air, or animals.
- 4 Record your observations and conclusions.

### Natural Seeds Images



Coconut Burdock Maple

### Drawings

### Observations:

- » The **coarse, toothed seed** sticks to the carpet (represents the dispersal of seeds by animals).
- » The seed that floats on the surface of the water (represents the dispersal of seeds by water).
- » Seeds with wings are blown with air (represent the dispersal of seeds by wind).

« البذرة الخشنة المسننة تلتصق بقطعة السجاد (تمثل انتشار البذور بواسطة الحيوانات).

« البذرة التي تطفو على سطح الماء (تمثل انتشار البذور بواسطة الماء).

« البذرة ذات الأجنحة التي تنفخ بالهواء (تمثل انتشار البذور بواسطة الرياح).

### Conclusion:

The method of seed dispersal depends on the shape, size and characteristics of the seeds.

« تعتمد طريقة انتشار البذور على شكل وحجم البذور وخصائصها.



## 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.



### Question:

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



### 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.



### Evidence:

- » 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.



### Scientific Explanation with Reasoning:

- » As you find in plant leaves, the light energy emitted by sunlight is converted into chemical energy.
- » If the basic needs of the plant are not met, it will not grow and may die.

#### Optional Activities



Activity 18 Analyze Like a Scientist

Farmers Growing Plants: Irrigation



Activity 19 Evaluate Like a Scientist

Review: Plant Needs

Go Online on



Egyptian Knowledge Bank  
بنك المعرفة المصري





## Exercises on Activities 11 to 19

### 1 Choose the correct answer:

- 1 Plants can get their energy and make their own food through \_\_\_\_\_ process.  
a. digestion      b. respiration      c. thinking      d. photosynthesis
- 2 The \_\_\_\_\_ system helps humans and animals to get the energy needed from food.  
a. nervous      b. circulatory      c. digestive      d. skeletal
- 3 Air goes in and out the leaf through the \_\_\_\_\_ .  
a. xylem      b. chlorophyll      c. stomata      d. phloem
- 4 Oxygen gas is extracted from air inside the \_\_\_\_\_ of a human.  
a. nose      b. mouth  
c. nose and mouth      d. two lungs
- 5 All of the following are properties of oxygen gas, except that \_\_\_\_\_ .  
a. it is released from photosynthesis  
b. it is extracted from lungs in humans  
c. it is a wasted material for humans  
d. it is a wasted material for plants
- 6 The human circulatory system includes all the following structures, except the \_\_\_\_\_ .  
a. heart      b. vein      c. artery      d. lungs
- 7 Blood vessels carry all the following components, except \_\_\_\_\_ .  
a. water      b. oxygen gas  
c. carbon dioxide gas      d. nutrients
- 8 \_\_\_\_\_ carry the blood rich in oxygen from the heart to all the body cells.  
a. Xylems      b. Arteries      c. Veins      d. Nerves
- 9 Both of \_\_\_\_\_ and \_\_\_\_\_ are similar in carrying nutrients.  
a. arteries - phloem      b. veins - xylem  
c. arteries - xylem      d. veins - phloem
- 10 Veins carry the blood rich in \_\_\_\_\_ to the heart.  
a. nutrients      b. oxygen gas  
c. carbon dioxide gas      d. water
- 11 \_\_\_\_\_ transport water rich in nutrients upward the plant.  
a. Stomata      b. Veins      c. Arteries      d. Xylems

## • Concept 1 Plant Needs

- 12 The \_\_\_\_\_ is/are responsible for the transmission of food from the leaves to all plant parts.  
a. chlorophyll      b. stomata      c. xylem      d. phloem
- 13 The human circulatory system and the plant transport system are similar in \_\_\_\_\_.  
a. structure      b. function      c. shape      d. color
- 14 The \_\_\_\_\_ has a very small flower that can hardly be seen.  
a. sunflower      b. grass      c. rose      d. vine
- 15 Most of flowers are similar in \_\_\_\_\_.  
a. size      b. color      c. job      d. shape

## 2 Put (✓) or (X):

- 1 Air enters the leaf of the plant through the stomata. (   )
- 2 Both humans and plants need energy to grow and survive. (   )
- 3 Air enters the human body through the lungs. (   )
- 4 You can't see the veins and arteries inside your body. (   )
- 5 Blood moves in the human body in one direction. (   )
- 6 Arteries carry the blood rich in oxygen from the heart to all the body cells. (   )
- 7 Veins carry the blood rich in carbon dioxide gas to all the body cells. (   )
- 8 Nutrients in the xylem move upward in one direction. (   )
- 9 Glucose is produced in plants by digestion process. (   )
- 10 In photosynthesis, light energy is changed to chemical energy. (   )
- 11 Carbon dioxide gas is a wasted material for all the living organisms. (   )
- 12 Energy can't be transformed from one form to another. (   )

## 3 Write the scientific term:

- 1 They carry blood rich with oxygen and glucose away from the heart to the body organs. (\_\_\_\_\_)
- 2 They return the blood that carries carbon dioxide to the heart for a recharge. (\_\_\_\_\_)
- 3 A system inside the human body that helps in getting the energy needed from humans food. (\_\_\_\_\_)



- 4 A system inside the human body that includes the heart and blood vessels. (.....)
- 5 It exists inside the leaf and is responsible for absorbing the sunlight from the sun. (.....)
- 6 It carries glucose from the plant's leaf to all the plant parts. (.....)
- 7 It carries nutrients from the plant's root to all the plant's leaves. (.....)
- 8 A part of the plant that is responsible for the reproduction process. (.....)
- 9 It is the process of making new flowers. (.....)
- 10 It is a process of transporting seeds from a place to another. (.....)

#### 4 Complete the following sentences:

- 1 Plants can manufacture their own energy, glucose, through ..... process.
- 2 Air enters the human body through the ..... and ..... and travels to the ....., where oxygen is absorbed into the circulating blood.
- 3 As we chew and swallow our food, nutrients are absorbed into the .....
- 4 They are two different types of blood vessels called ..... and .....
- 5 Blood moves in only ..... direction in humans veins or arteries.
- 6 ..... carry blood rich with oxygen and glucose away from the heart.
- 7 ..... return the blood that carries carbon dioxide back to the heart for a recharge.
- 8 ..... transport water rich in nutrients from the top of the plant to the leaves.
- 9 ..... starts to manufacture glucose when water reach it.
- 10 The ..... carries the glucose to other parts of the plant.
- 11 As plant cells use glucose, they release ..... and ..... in the air.
- 12 Energy can be ..... from one form to another.
- 13 Flowers of plants have different ..... or ....., while they have the same .....
- 14 Some plants, such as ..... have very small flowers that are hardly noticeable.

#### 5 Cross out the odd word:

- 1 Photosynthesis - Chemical energy - Thermal energy - Water (.....)
- 2 Xylem - Stomata - Veins - Phloem (.....)
- 3 Flower - Stem - Roots - Leaf - Blood (.....)

## 6 Classify the following words in these tables:

Xylem – Veins – Blood – Phloem – Artery – Roots – Heart

Human Circulatory System

Plant Transport System

## 7 Choose from column (A) what suits it in column (B):

Column (A)

- 1 Veins
- 2 Phloem
- 3 Arteries
- 4 Xylem
- 5 Flower
- 6 Plant's leaf
- 7 Plant's Root
- 8 Plant's Stem

Column (B)

- a. Transmission of nutrients and water to the plant's leaves.
- b. Allowing the needed air to enter through it.
- c. Transmission of blood that carries carbon dioxide to the heart.
- d. Fixing the plant in the soil.
- e. Transmission of food from a plant's leaf to other plant parts.
- f. Supporting the plant and connecting the roots to the leaves.
- g. Transmission of blood rich in oxygen gas and nutrients to all cells.
- h. Responsible for reproduction in plants.

1 .....

2 .....

3 .....

4 .....

5 .....

6 .....

7 .....

8 .....

## 8 What happens if:

- 1 Sun disappears suddenly. (concerning the effect on plants and animals)
- 2 Xylem is removed from the plant structure.
- 3 Human body contains arteries only without veins.

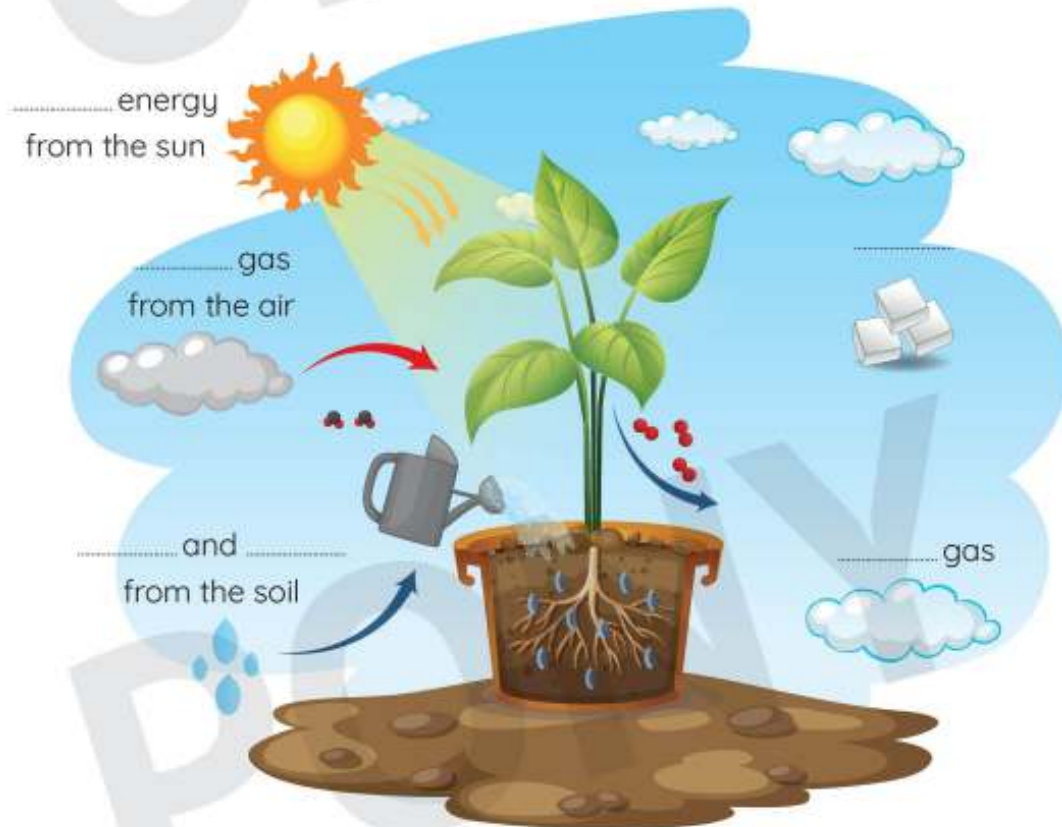
## 9 Give reasons for:

- 1 Plants and humans get the needed energy in different ways.
- 2 Arteries and veins play a very important role in the human body.
- 3 Although flowers are different in their color and size, but they perform the same job.



**10** Study the following figure, then answer the questions:

- 1 The opposite figure represents the photosynthesis process, complete the following:



- 2 The opposite figure represents a plant's leaf, complete the following:

- 1 is the ..... and it is responsible for .....
- 2 is the ..... and it is responsible for .....



- 3 The opposite figure represents blood vessels inside humans, complete the following:

- a. Structure ..... carries the blood rich in oxygen gas and nutrients to the .....
- b. Structure ..... carries the blood rich in carbon dioxide gas to the .....
- c. The blood moves through them in ..... direction.



# Guide Answers

## Concept 1

### Activities 1 to 5

- 1 1 c 2 d 3 b 4 d  
5 c 6 c 7 a 8 c  
9 c 10 b 11 d 12 a

- 2 1 ✓ 2 ✗ 3 ✓ 4 ✗  
5 ✓ 6 ✓ 7 ✗ 8 ✗  
9 ✓ 10 ✓ 11 ✗ 12 ✗

- 3 1 Green plant  
2 Photosynthesis process  
3 Roots 4 Leaves

- 4 1 roots, stems, leaves, flowers, fruits  
2 water, nutrients, the soil, leaves  
3 survive, grow  
4 sunlight, water, carbon dioxide gas  
5 carbon dioxide, oxygen  
6 water, air, other plants

- 5 1 Shelter  
2 Carbon dioxide gas  
3 Oxygen gas  
4 Photosynthesis

- 6 1

Basic Plant Needs	Not Basic Plant Needs
Sunlight, water, carbon dioxide gas	Soil, oxygen gas, sugar

2

Plants Needs	Animals Needs	Animals and Plants Needs
Soil – Sunlight	Shelter	Water - Air

- 7 1 d 2 c 3 b 4 a

- 8 1 (A) 1. Leaf 2. Fruit  
3. Flower 4. Stem 5. Roots  
(B) 1. Roots 2. Leaves 3. Stem  
(C) Sunlight – water – carbon dioxide gas

- 2 (A) C (B) B (C) A

- 9 1 Because plant's roots absorb water and nutrients from the soil.  
2 Because plants can make their own food in their leaves through photosynthesis process.  
3 Soil is not a basic plant need because some plants don't need soil to grow and they grow in water, or in air or on other plants, while some plants need sunlight to make food through photosynthesis process.

- 10 The plant's leaves will be yellow and the plant will die quickly.

## Concept 1

### Activities 6 to 10

- 1 1 d 2 c 3 b 4 c  
5 b 6 c 7 d 8 c  
9 a 10 d 11 d 12 c  
13 b 14 c



- 2**
- |      |      |      |      |
|------|------|------|------|
| 1 ✓  | 2 ✗  | 3 ✓  | 4 ✗  |
| 5 ✗  | 6 ✓  | 7 ✗  | 8 ✓  |
| 9 ✗  | 10 ✗ | 11 ✓ | 12 ✓ |
| 13 ✗ | 14 ✓ | 15 ✓ | 16 ✓ |
| 17 ✓ |      |      |      |

- 3**
- |               |           |
|---------------|-----------|
| 1 Chlorophyll | 2 Stomata |
| 3 Xylem       | 4 Stem    |

- 4**
- |  |                |
|--|----------------|
| 1 slower than  | 2 longer than  |
| 3 sunlight   |                |
| 4 Sunlight, carbon dioxide, water                    |                |
| 5 Plants, humans, animals                            |                |
| 6 water, nutrients                                   |                |
| 7 Xylem, phloem, leaves                              |                |
| 8 leaves, carbon dioxide gas                         |                |
| 9 soil, root   |                |
| 10 wood, potatoes                                    |                |
| 11 narrow, needles                                   | 12 chlorophyll |
| 13 light, water, carbon dioxide, glucose, oxygen gas |                |
| 14 plants, humans, animals                           |                |

- 5**
- |             |              |
|-------------|--------------|
| 1 Root hair | 2 Oxygen gas |
|-------------|--------------|

- 6**
- |     |     |     |     |
|-----|-----|-----|-----|
| 1 c | 2 e | 3 b | 4 a |
| 5 d |     |     |     |

- 7**
- |  |
|--|
| 1 (a) oxygen – plants – the human  |
| (b) carbon dioxide, water, sunlight  |
| 2 (a) decreases (b) green  |
| 3 photosynthesis, sunlight, chlorophyll, carbon dioxide, stomata, water, xylem |

- 8**
- |   |
|---|
| 1 Because soil is rich in water and useful nutrients that the plant need. |
|---|

- 2** Because green plants release oxygen gas during photosynthesis process which is necessary to animals and humans.
- 3** Because plants can make their own food during photosynthesis.

- 9**
- |   |
|---|
| 1 The leaves color changes from green to yellow and their number decreases. |
| 2 The wood color will change to the color of the water in the cup           |

### Concept 1

#### Activities 11 to 19

- 1**
- |      |      |      |      |
|------|------|------|------|
| 1 d  | 2 c  | 3 c  | 4 d  |
| 5 c  | 6 d  | 7 a  | 8 b  |
| 9 c  | 10 c | 11 d | 12 d |
| 13 b | 14 b | 15 c |      |

- 2**
- |     |      |      |      |
|-----|------|------|------|
| 1 ✓ | 2 ✓  | 3 ✗  | 4 ✗  |
| 5 ✓ | 6 ✓  | 7 ✗  | 8 ✓  |
| 9 ✗ | 10 ✓ | 11 ✗ | 12 ✗ |

- 3**
- |                        |          |
|------------------------|----------|
| 1 Arteries             | 2 Veins  |
| 3 Digestive system     |          |
| 4 Circulatory system   |          |
| 5 Chlorophyll          | 6 Phloem |
| 7 Xylem                | 8 Flower |
| 9 Reproduction process |          |
| 10 Seed dispersal      |          |

- 4**
- |                        |                    |
|------------------------|--------------------|
| 1 photosynthesis       |                    |
| 2 nose – mouse – lungs |                    |
| 3 blood                | 4 arteries – veins |
| 5 one                  | 6 Arteries         |
| 7 Veins                | 8 Xylems           |

## Model Answers

- 9 Plant's leaf      10 phloem  
11 oxygen and water vapor  
12 transformed  
13 size – shape – function  
14 grasses

- 5 1 Thermal energy  
2 Veins      3 Blood

6

Human Circulatory System	Plant Transport System
Veins – Blood – Arteries – Heart	Xylem – Phloem – Roots

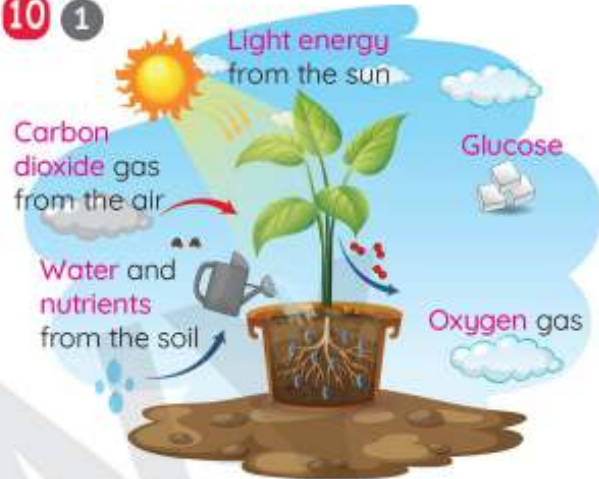
- 7 1 c      2 e      3 g      4 a  
5 h      6 b      7 d      8 f

- 8 1 Plants and animals will die.  
2 Water rich in nutrients can't reach the plant leaf.  
3 The human body can't get rid of carbon dioxide gas, so humans will die.

- 9 1 Plant get the needed energy from the photosynthesis process that takes place in the plant's leaf, while humans get energy from digestion process.

- 2 Because arteries carry the blood rich in oxygen and nutrients to all body cells, while veins carry the blood rich in carbon dioxide gas to the lungs to recharge.  
3 Because the flower helps the plant in the reproduction process

10 1



- 2 - phloem – transmission of food from the plant's leaf to other plant parts.  
- xylem – transmission nutrients-rich water to the plant's leaf.  
3 (a) 1- body cells      (b) 2- lungs  
(c) one



# Glossary

## Activity (1)

Analyze	حلل	Scientist	عالم	Nutrients	عناصر غذائية
Soil	التربة	Survive	ينجو	Flower	زهرة
Stem	ساق النبات	Leaf	ورقة النبات	Roots	جذور النبات

## Activity (2)

Healthy	صحي	Grow	تنمو	Seedling	شتلة
Natural	طبيعي	Source	مصدر	Preparing	تحضير

## Activity (5)

Survive	يبقى على قيد الحياة	Nutrients	العناصر الغذائية	Carbon dioxide	ثاني أكسيد الكربون
Shelter	مأوى	Photosynthesis	البناء الضوئي	Process	عملية
Similar	متشابه	Need	يحتاج	Air	هواء
Human	إنسان	Produce	ينتج	Liquid	سائل
Sugar	سكر	Growth	نمو	Leaves	أوراق أشجار
Absorb	تمتص	Kind	نوع		

## Activity (7)

Experiment	تجربة	Test	اختبار	Germinate	تنبت
Seeds	بذور	Compare	قارن	Planted	مزروعة
Slower than	أبطأ من	Observation	الملاحظة	Essential	ضروري
Elements	عناصر	Light	ضوء	Dark	مظلم
Amount	كمية	Determine	يحدد	Important	مهم

## Activity (8)

Basic	أساسي	Structure	بنية	Deliver	يوصل
Collect	يجمع	Through	خلال	Tiny	صغير الحجم
Stomata	الثغور	Allow	يسمح	Vessels	أوعية
Xylem	أوعية الخشب	Tubes	أنابيب		

Activity (9)			
Specific	محدد	Function	وظيفة
Increase	يزيد	Decrease	يقل
Impossible	غير ممكن	Vessels	أوعية
Wood trunk	ساق خشبية	Upright stem	ساق مستقيمة
Trunk	جذع	Shrubs	الشجيرات
Narrow	ضيق	Needle	إبرة
Flat and wide	مسطحة وعريضة	Necessary	ضروري
Product	ناتج	Mineral salts	أملاح معدنية
Chlorophyll	كلوروفيل	Capture	يمتص
Manufacture	صناعة	Starch	نشاء
Proteins	البروتينات	Live	يعيش
Downward	لأسفل	Upward	لأعلى
Fix	يثبت	Transport	ينقل
Support	يدعم	Climb stem	ساق متسلقة
Vines	العنب	Spine	شجرة الصنوبر
Factors	عوامل	Occur	يحدث
Combine	اتحاد	Fats	الدهون
Phloem	أوعية اللحاء	Produce	ينتج

Activity (10)			
Stay alive	يبقى على قيد الحياة	Celery stalk	ساق الكرفس
Texture	نسيج		

Activity (11)			
Compare	قارن	Digestive system	الجهاز الهضمي
Circulating blood	الدورة الدموية	Circulatory system	الجهاز الدوري
Blood vessels	الأوعية الدموية	Cell	خلية
Muscles	عضلات	Bones	عظام
Arteries	الشرايين	Direction	اتجاه
Heal	الشفاء	Production	إنتاج
Environment	بيئة	Combine	يتحد
Lung	الرئة	Heart	قلب
Organ	عضو	Veins	الأوردة
Skin	جلد	Considered	يعتبر
Transformation	تحويل		

Activity (15)			
Specific	محدد	Structure	تركيب
Receive	يستقبل	Colorful	ملون

Activity (16)			
Seed dispersal	نثر البذور	Coconut	جوز الهند
Burdock seeds	بذور الأرقطيون	Apple seeds	بذور التفاح
Tomato seeds	بذور الطماطم	Dandelion seeds	بذور الهندباء

Activity (17)			
Vital process	عملية حيوية	Depend on	يعتمد على
Die	يموت	Function	وظيفة