You have already made and compared your flower models, but are they real flowers? Let's learn more about flowers.

1 **Look at the flower and draw a picture of it.**

Name of the flower: _____

2 **Take off the small outer green leaves and the petals. Draw what you see now.**

3 **In pairs, compare the flower model you made on page 4 with the picture of the flower above. Then answer the questions.**

1 Does your model have the same parts as the flower above? _____

2 If necessary, circle the parts that your model hasn't got:

- Small green leaves on the outside of the flower
- Petals
- Filaments with a tiny sac at the top
- A small bottle-shaped container in the middle of the flower

4 **Do you think that the four parts listed in Activity 3 have the same importance in a flower?**

Let's find an answer to this question. Look up the definition of the word 'flower' in the dictionary. Then, in pairs, write your own definition.

A flower is _____

_____

_____

5 **Think and answer.**

1 What are the essential parts that all flowers must have? _____

_____

2 Tick the parts that you think are the reproductive organs of a flower (male and female).

- Small green leaves on the outside of the flower ☐
- Petals ☐
- Filaments with a tiny sac at the top ☐
- A small bottle-shaped container in the middle of the flower ☐

3 Does your model look like a real flower? _____ Why/Why not? _____

_____

4 What is the specific function of flowers? _____

_____

WE HAVE LEARNED THAT...

Flowers are the _____ _____ of flowering plants.

A flower has got _____ reproductive organs and/or _____ reproductive organs.

Think about the initial questions. Any ideas so far?

We know that flowers are the reproductive structure of flowering plants, but what organs are there in a flower? Emma and Joe want to know, do you?

1 Look carefully at these photos of flowers.

White Lily

Tulip

Bindweed

Kiwi flower

Rose

Almond tree flower

2 Draw three more parts of the flowers in Activity 1. Write the name of the flowers that have these parts.

White Lily, Tulip, Bindweed, Rose, Almond tree flower, Kiwi flower

3 **Share and compare your answers with the rest of the class. Do all the flowers have the four main parts?**

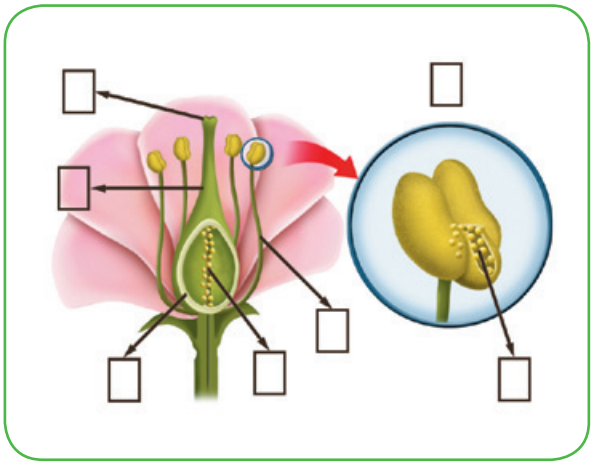
_____

4 **Look for the definitions of 'carpel', 'stamen', 'calyx' and 'corolla' and complete the sentences.**

- The corolla is formed by a group of _____ .
- The calyx is formed by a group of _____ .
- The carpel is _____ by a _____ , a _____ and an _____ .
- The stamen _____ .

5 **Label the four main parts of the flower in both pictures. Then colour them using a different colour for each part.**

6 **Identify the carpel and the stamens in this picture. Read the definitions below and label the parts of the carpel and the stamen.**



1 **Anther:** The part of the stamen that contains pollen.

2 **Filament:** The stalk* that supports the anther in a stamen.

3 **Ovary:** The part of the carpel where seeds* are produced. It will later develop into a fruit.

4 **Ovule:** The female reproductive structure in the ovary of flowering plants that develops into a seed.

5 **Pollen:** The male reproductive grains* inside the anther.

6 **Stigma:** The top part of the carpel. It receives pollen.

7 **Style:** The part of the carpel that connects the stigma and the ovary.

7 **Look, think and answer the questions.**

1 Identify the organs in these three flowers. They are **complete flowers**. Do you know why?

Because _____

_____

_____

2 Which flowers have got carpel?

_____

3 Which flowers have got stamens?

_____

4 Only one of the three flowers is a **perfect flower**. Which one is it? _____

Explain your answer: _____

_____

8 **Read and answer the following questions.**

1 Why do flowers look different from one another? Circle the correct answers.

a Because it depends on how flowers reproduce.

b Because some flowers don't need water to live.

c Because some flowers are complete or perfect flowers and some aren't.

d To make the world a beautiful place to live in.

2 Are all complete flowers perfect? _____ .

3 Are all perfect flowers complete? _____ .

9 **In groups of five, play the 'flowering game'.**

WE HAVE LEARNED THAT...

Flowers have essential organs: _____ .

The reproductive _____ of a flower are the _____ _____ _____ called _____ and/or the _____ _____ called _____ or _____ .

- The stamen is formed by the _____ and the _____ that contains the _____ .
- The carpel or _____ is formed by the _____ , the _____ and the _____ that contains _____ . _____ flowers have both sexes, _____ and _____ .

Other organs that may or may not be present in flowers are:

- The _____ , formed by sepals that _____ and _____ the flower together.
- The _____ , formed by _____ which attract _____ or _____ .

A _____ _____ is formed by the calyx (sepals), the corolla (petals), the stamens and the carpel.

We know about the reproductive organs in flowers and that some flowers are perfect while others aren't. But how do flowers work?

1 **In groups of three, each person chooses one of the three types of flowers below. Write your names.**

A Roses: _____ **B** Oak tree flowers: _____ **C** Holly bush flowers: _____

2 **Read your text (A, B or C) to become an expert on that type of flower. Find out the most important characteristics of this type of flower.**

A

HOLLY BUSH FLOWERS

Holly bushes are evergreen, which means that they never lose their leaves. Their leaves are long, between 5 to 12 cm, and they are dark green, with saw teeth around the edge.

Holly bush flowers are not perfect, they are unisexual. Male and female flowers are located in different plants. It is difficult to distinguish a male holly bush from a female one until they bloom*. The best way to know the sexuality of holly bushes is to look at the flowers. Male holly flowers appear in groups; they are yellowish and have big stamens. Female holly flowers grow more isolated or in groups of three, they are smaller and they are either white or pink.

Male and female plants are needed for pollination to take place (the transfer of pollen to stigmas). Male plants have to be near female plants.

Holly bush fruits are berries. Only female plants produce berries. They are bright red and they ripen* in autumn. They remain* on the holly bushes for a long time (often all winter) and they are good food for animals in the forest. They are toxic to humans.

In some areas, holly bushes are in danger of extinction and they are protected species to stop people taking them home to use them as Christmas decorations.

B

OAK TREE FLOWERS

Oak trees are strong trees but they are not usually very tall. The top of the oak trees is wide and dense with leaves. The bark is dark and rough*.

Some oak trees are evergreen, which means that they usually keep their leaves all year round.

Oak tree flowers are not perfect flowers, they are unisexual. They have separate male and female flowers in the same tree. Male flowers have the male sexual organs and female flowers have the female sexual organs in order to reproduce.

The flowers are small and do not have large scented* petals because they do not need to attract insects. They are pollinated by wind (the wind helps to transfer pollen to stigmas). Anthers with light pollen grains hang outside the flower. The wind transports the pollen grains and carries* them to the stigmas.

The oak tree fruit is a nut, called an acorn, which takes the form of a cup-like* structure. Each acorn contains one seed and takes six to eighteen months to mature. Acorns are a good food source for some animals.

Oak trees can be found either on their own or collectively to form oak forests. Their wood is very good for making furniture and in the past, oak trees were a good source of charcoal*.

C

ROSES

Roses are beautiful flowers. There are lots of species and different types of roses. Most species are natives of Asia, but there are also roses in Europe, America or Africa.

Rose plants differ in size. Some can be miniature rose plants and others can be very tall. Most roses are large and smell nice. They come in different colours, varying from white to yellow or red. They usually have five rounded petals, and under the petals there are five green sepals.

In relation to their reproductive organs, roses are perfect flowers, because they contain both male and female organs in the same flower.

Roses are colourful and smell nice in order to attract insects. Insects help roses to pollinate (transfer pollen to stigmas) so that they can reproduce. Sometimes pollen is carried to a stigma in the same flower or to a stigma in another flower.

Finally, in lots of places, there are rose exhibitions and contests because garden roses are one of the most popular cultivated groups of flowering plants. There are some beauty products based on rose scent*, such as perfumes, soaps, gels and moisturisers, and you can eat the petals in salads and ice creams too.

3 **In your original group, share the key information and complete the table.**

Type of flower	Is it perfect?	Where are the male and female reproductive organs?	Description of the flower	Pollination
Holly bush flowers				
Oak tree flowers				
Roses				

WE HAVE LEARNED THAT...

There are different types of _____ _____ depending on the location of the _____ _____ in each flower.

Most flowers are _____ . They are usually pollinated by _____ .

That is why they are _____ , have _____ _____ and _____ pleasant, in order to _____ _____ .

Sometimes _____ is carried to a _____ in the same _____ .

On other occasions _____ is carried to a _____ in another _____ .

Some flowers are not _____ , they are _____ . They are either male or female.

Some _____ male and female flowers can be found on the same _____ and some _____ flowers can be found in _____ _____ .

Flowers that are pollinated by the _____ are _____ and do not have _____ _____ _____ .

4 SO BEAUTIFUL, SO DIFFERENT!

The world of flowers is fantastic. In the story Joe asks about the differences between different flowers. Do you think you can identify them? Let's play a game!

1 **Which is which? Listen and write the numbers.**

a 

b 

c 

d 

e 

f 

1 Tomato flower (*Solanum lycopersicum*)

2 Poppy (*Papaver rhoeas*)

3 Carnation (*Dianthus caryophyllus*)

4 Sunflower (*Helianthus annuus*)

5 Daisy (*Bellis perennis*)

6 Lavender (*Lavandula angustifolia*)

2 **Play a guessing game. Which flower am I thinking of?**

It's a red flower with radial symmetry*.

No, it isn't.

Yes, it is. Your turn!

Is it a carnation?

Is it a poppy?

3 **In pairs, read the text and answer the questions.**

Imagine you are a producer of roses, the queen of flowers. Your rose nursery is full with all kinds of roses with all different colours and fragrances. You want to produce a new kind of rose, for example, a rose with a new mixture of colours.

1 Which of the rose's organs should participate in the production of a new kind of rose?

_____ . Why? _____

_____ .

2 Where do you think the genetic code* with the rose characteristics is stored*?

_____ .

3 In different steps, illustrate how you would create a new type of rose.

4 **Watch the video about an expert producer of roses.**

5 **Order the following sentences from the video. Write a number in each box.**

- ☐ Finally, he needs to be patient and wait for new seeds to develop so he can plant them.
- ☐ First, the producer of roses takes off the sepals and corolla of the first rose.
- ☐ Then he takes off the sepals, stamens and corolla of a second rose.
- ☐ He uses a brush to pollinate the carpel of the second rose with the pollen from the first rose.
- ☐ He puts a top over the pollinated carpel.
- ☐ After that, he dries the grains of pollen in the shade.

6 **Read and answer the questions below.**

1 Did you do the same as the producer of roses? _____

2 Who is the pollinator in the video? _____

3 Why does the producer of roses put a top on the pollinated carpel? _____

_____

4 Why does the producer of roses need to be patient? _____

_____

WE HAVE LEARNED THAT...

There is a great _____ of flowers.

The diversity depends on the _____ :

- The _____ and stamen positioning, free or _____ .
- The _____ and _____ can look the same. They also can be _____ or _____ .
- The symmetry of the flower: _____ or _____ .
- Flowers organisation: a _____ _____ or _____ .
- The reproductive organs: _____ or _____ (only stamens or carpels). _____ and _____ store the _____ _____ of flowers. Humans can control the _____ of flowers.

We know a lot about flowers now. Let's enjoy having a closer look at them. Let's dissect a flower.

STEP 1: ORGANISE YOUR WORK

1 **In groups of three, choose a flower. Decide on a role for each person.**

ROLES	NAMES and TASKS
The stereo microscope responsible	_____ will be in charge of supervising the use of the microscope.
The photographer	_____ will be in charge of taking photos to illustrate the investigation.
The editor	_____ will write down the results, with help from all members of the group.
All members in the group will observe and do the scientific drawings.	

2 **Think of the materials you need and write them down.**

WE NEED
_____
_____

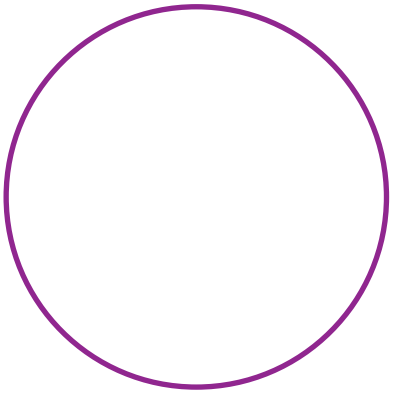
STEP 2: GENERAL OBSERVATION

3 **Look very carefully at the flower. Do a detailed drawing of it and label its parts.**

STEP 3: DETAILED OBSERVATION

4 **Take off the sepals and petals. Use the hand lens to observe them. Then draw and describe them below.**

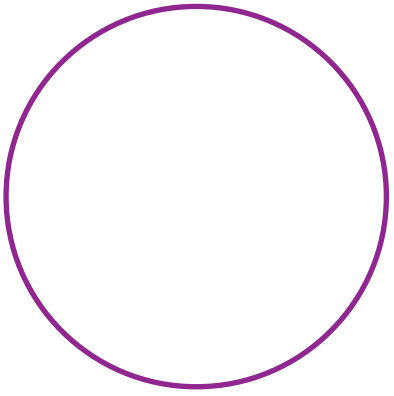
sepals and petals



How many petals are there? How many sepals are there? Are they fused*? Are they single?

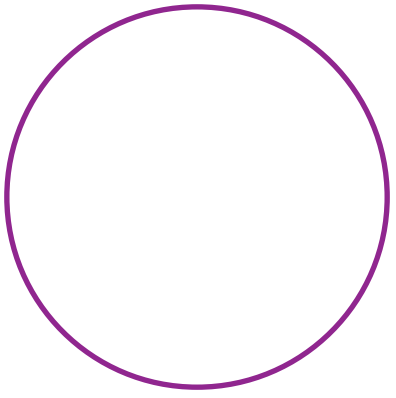
5 **Use your tweezers* to separate the reproductive organs of the flower. Use the hand lens to observe them. Then draw and describe them below.**

carpel



What is it like? Is it single? Is it fused? How many carpels has it got?

stamens

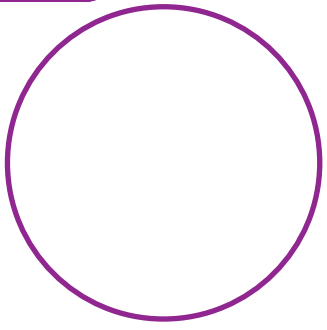


What are they like? Are they single? Are they fused? What is the position of the stamens around the carpel?

6 **Use the stereo microscope, the tweezers and a dish. Look closely at the stamen. Then draw and describe it below.**

Total magnification _____ = _____ eyepiece x _____ objective

stamen

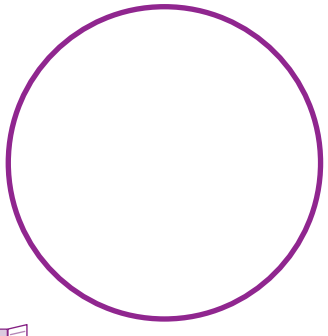


What are the anthers like? What about the filaments?

In a dish and using a scalpel*, very carefully separate the anther from the filament and cut the anther. Scatter* some of the grains from the anther in the dish. Look closely at the pollen grains, then draw and describe them.

Total magnification _____ = _____ eyepiece x _____ objective

pollen grains

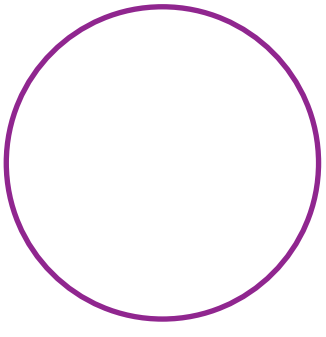


What do the grains look like? Describe their colour and appearance.

7 **Use the stereo microscope, the tweezers and a dish. Look at the carpel. Then draw and describe it.**

Total magnification _____ = _____ eyepiece x _____ objective

carpel



What does it look like? Describe its shape and colour.

Using a scalpel, very carefully make a transversal* cut of the carpel in the dish. Draw your observations and describe them.

Total magnification _____ = _____ eyepiece x _____ objective

transversal section of the carpel

How many carpels are there? Are they fused? What's inside them? Describe their colour and appearance.

STEP 4: CONCLUSIONS AFTER THE OBSERVATION

8 **Present your observations on a poster.**

Prepare an oral presentation about the results of your observation. Use the following information:

- Roles of the group members
- Common and scientific name of the flower you have observed
- Photograph of the flower or/and drawings
- Scientific description of the flower
- Conclusions: Is it perfect / imperfect / male flower / female flower / complete / inflorescence?

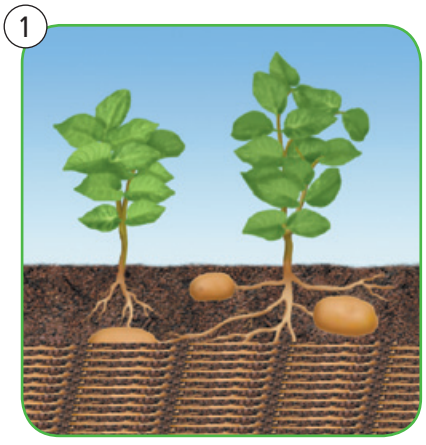
Characteristics of a scientific description		Example
Specific vocabulary	Vocabulary related to flowers and their functions	pollen, style, symmetric, inflorescence, pollinate, etc.
Sentences that give information on the topic using specific vocabulary	What does it do? What does it look like? What are the parts like? Why?	The flowers are clustered* together forming inflorescences.
The objective is to describe something real	It gives specific information. It doesn't use imagination or describe emotions	The petals are bright red. They are 2cm long.

6 ARE THERE OTHER WAYS FOR PLANTS TO REPRODUCE?

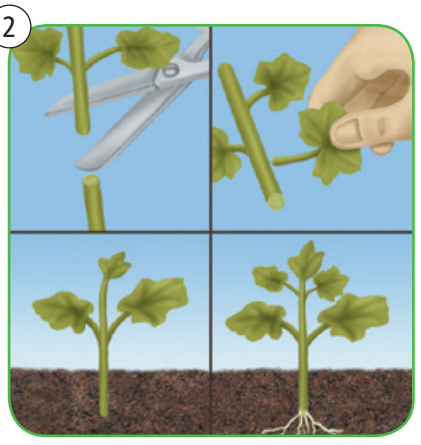
We now know that flowers are the main reproductive structure of flowering plants. But is there any other way for flowering plants to reproduce? What about non-flowering plants?

1 **Look and think about what is happening in each drawing.**

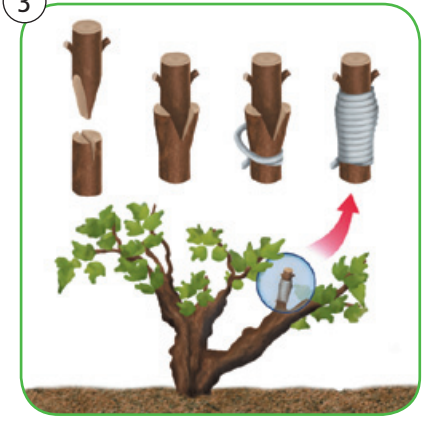
1



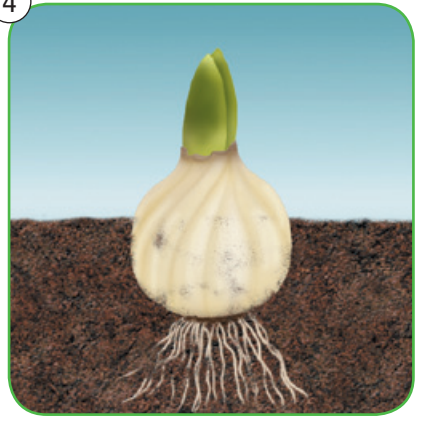
2



3



4



2 **Match each type of asexual reproduction with the above pictures. Write the number of the corresponding picture.**

a Cutting: when you cut a piece of a plant and you put the cutting into water or compost until roots grow. ☐

b Daffodil or tulip bulbs can develop into a new plant every year. ☐

c Potato tubers in the soil can develop into new potato plants. ☐

d Grafting: when the cutting is inserted into a branch or stem of another plant. ☐

3 **Classify the following pictures into two groups, A or B. Give each group a title and describe the common characteristics for each group.**

1 

2 

3 

4 

5 

Group A: _____

Common characteristic(s): _____

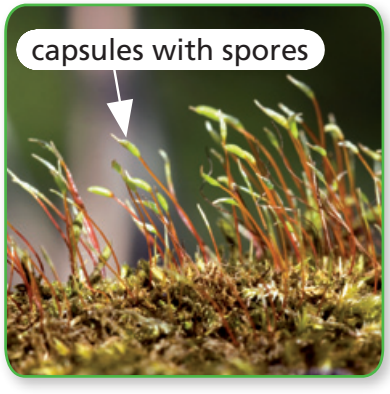
_____

Group B: _____

Common characteristic(s): _____

_____

4 **How do non-flowering plants reproduce? Look at the pictures and answer the question.**



What do you think is the function of these tiny capsules?

They contain _____ that help mosses and ferns _____ .

5 **Read and write T (True) or F (False).**

1 Cutting is a method of sexual reproduction. ☐

2 Asexual reproduction uses the reproductive organs. ☐

3 Asexual reproduction means there's only one parent. ☐

4 Asexual reproduction is good for commercial purposes (agriculture, gardening, etc.). ☐

5 Sexual reproduction is related to flowers. ☐

6 Flowering plants can reproduce by spores. ☐

WE HAVE LEARNED THAT...

Some _____ plants can reproduce _____ through _____ and _____ .

Other methods of _____ reproduction are _____ and _____ . These artificial methods are used by _____ , _____ or _____ .

Plants can be classified into _____ and _____ plants. _____ plants like mosses or _____ reproduce by using _____ that are carried by the _____ .

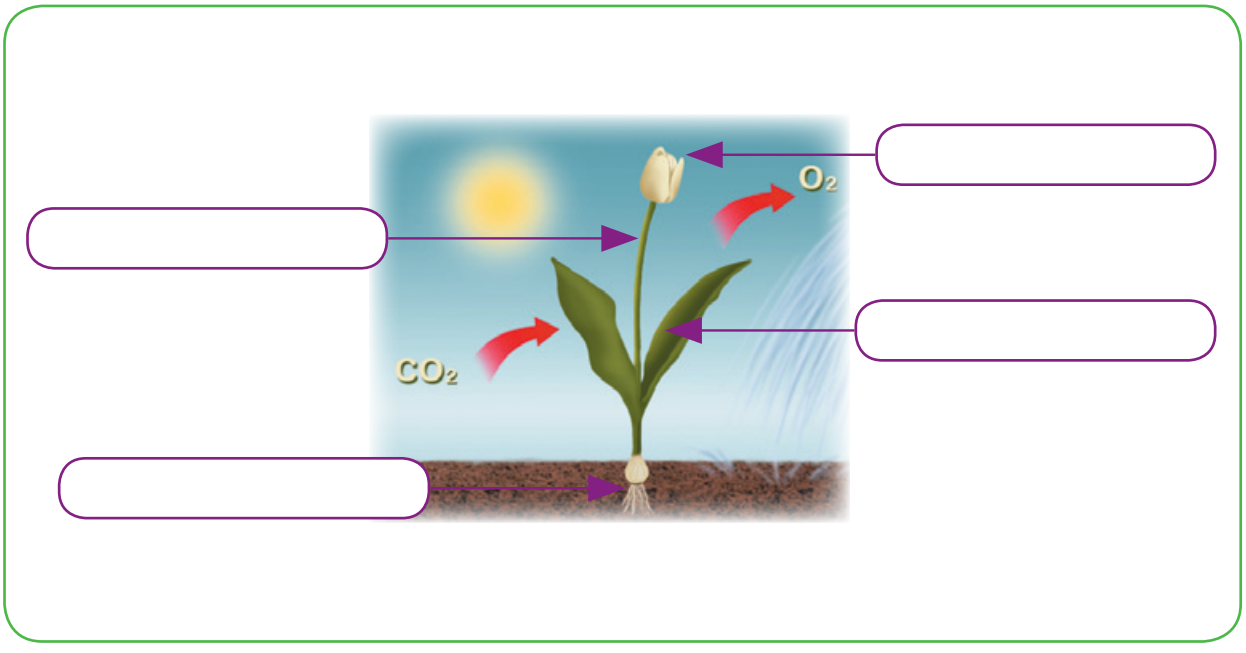
WWW HOW INTERESTING!

National flowers as symbols to represent countries.

Think about the initial questions. Any ideas so far?

We now know that plants reproduce. What else can we find out about plants?

1 Look at the following picture of a plant and its main parts. Label them.



2 Now read and match.

1	Flowers	a	They anchor the plant into the ground. And they collect water and minerals from the soil.
2	Stem	b	They collect the sunlight and carbon dioxide and they make food for the plant and release oxygen.
3	Roots	c	It holds the plant towards the sun. It transports substances around the plant.
4	Leaves	d	They contain the male and female reproductive organs.

3 **Reproduction is one of the three basic functions that living things perform. Which are the other two basic functions?**

They are _____ and _____ .

4 **In pairs, answer the following questions.**

1 Do plants incorporate the function of interaction? Give examples to justify your answer.

_____

_____

2 Do plants incorporate the function of nutrition? How?

_____

_____

3 Are plants living things?

Yes / No, because _____

WE HAVE LEARNED THAT...

Plants have four main parts: _____ , _____ , _____ and _____ .

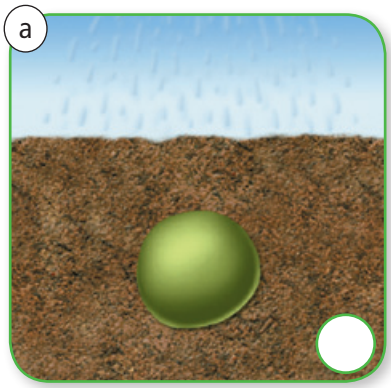
- Flowers contain _____ in order to _____ .
- _____ collect the _____ and carbon dioxide and they make _____ for the plant and release _____ .
- The _____ holds the plant towards the _____ and _____ substances around the plant.
- The _____ anchor the plant into the _____ and they collect _____ and _____ from the soil.

Plants are _____ _____ because they perform the _____ basic functions of _____ , _____ and _____ .

Now we know that flowering plants are living things, because they perform the three basic functions (reproduction, interaction and nutrition). But how do plants evolve in order to perform these functions?

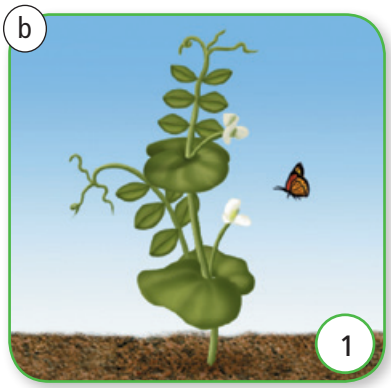
1 **In pairs, order the pictures of the life of a pea. Write the numbers.**

a



The pea seed takes in water from the soil. The water makes the seed swell*.

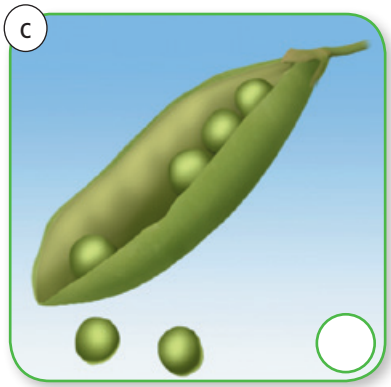
b



Flowers open on the plant.

Insects visit the flowers and pollinate the plant.

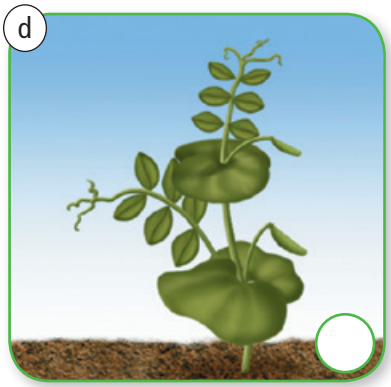
c



The pods* dry up.

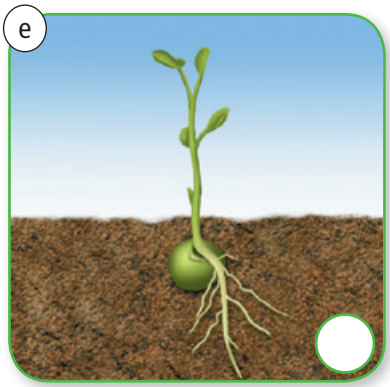
They open and new peas drop out.

d



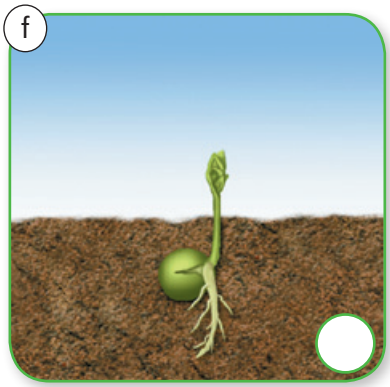
The flowers die and pods begin to form in their place.

e



The plant grows. It makes its own food using sunlight.

f



The seed germinates. First a new root appears, then a shoot*.

2 **Watch the video that shows the life cycle of a flowering plant. Then write T (True) or F (False).**

1 Some plants need flowers to reproduce. ☐

2 Pollen is created in the female reproductive organs. ☐

3 Pollen has to get to the ovules for the plant to produce seeds. ☐

4 Pollen and ovules contain the genetic code* for the new plant. ☐

3 **Now answer the questions on the video.**

1 The transfer of the pollen to the ovule is called pollination. How many methods of pollination can you name? _____

_____

2 What are the flowers like in each case? _____

_____

3 How is a seed produced?

A seed is produced by _____ , which means that the _____ and _____ fuse together.

4 What is formed after fertilisation?_____

What does it contain?_____

5 What does the fruit do? _____

6 Why are the seeds dispersed? _____

7 How can the seeds be dispersed? Write at least three examples:

_____

_____

_____

8 When a new plant starts to grow from a seed, the process is called _____ .

9 What do plants need to grow? _____

10 This process of the life of a flowering plant is called a **cycle**. Why?

It is called a cycle because _____

WE HAVE LEARNED THAT...

The life cycle of _____ _____ has different steps:

- _____ plants have flowers in order to _____ . They contain the _____ code for the _____ _____ .
- _____ is the transfer of _____ to the _____ .
- _____ is the production of _____ that are inside the _____ .
- The _____ carry the seeds far from their _____ plant. Seeds can be _____ in the following ways: by _____ and _____ , by the wind, by _____ or by _____ .
- Seeds _____ : a new plant starts to grow from a _____ .
- Plants _____ if they have got _____ , _____ , _____ and _____ .

Then the _____ begins again when _____ bloom in _____ _____ and are ready to _____ .