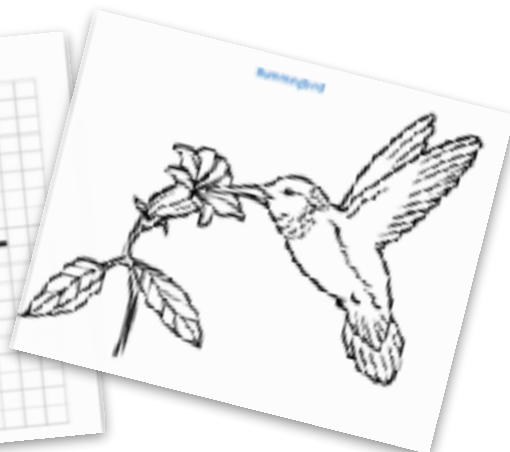
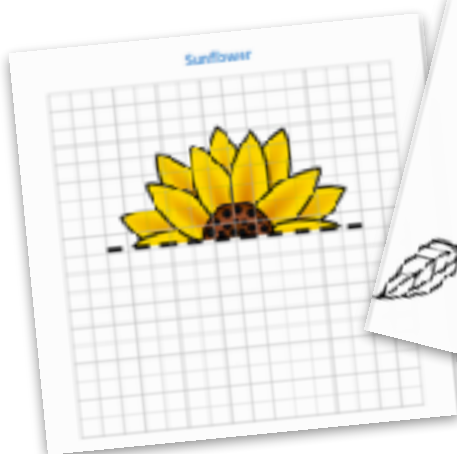


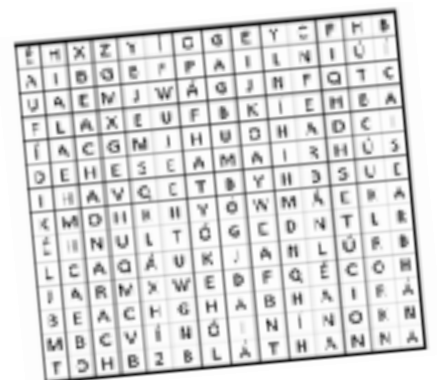
Protecting Farmland Pollinators



Newsletter
for Farming
Kids
April 2020



Games,
puzzles
and more



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About the Protecting Farmland Pollinators Project

This project is about small actions that will allow biodiversity to co-exist within a productive farming system. It aims to help farmers to provide small habitats that will offer food, safety and shelter on their farms for pollinators (wild bees, hoverflies) and other biodiversity.

The Protecting Farmland Pollinators project aims to develop and test a whole-farm pollinator scoring system and identify what management practices on Irish Farmland benefit pollinators.

This score will help farmers to understand how pollinator friendly their farm is and what simple low-cost actions they can take to work towards improving their score in a way that does not negatively impact on productivity.

In taking action to protect pollinators we start a chain reaction that has positive benefits for the

general health of our environment, and the wellbeing of future generations.

There are 40 participant farmers involved in the Protecting Farmland Pollinators Project from the Kildare area and bordering counties. To find out more please visit the website at www.biodiversityireland/farmland.

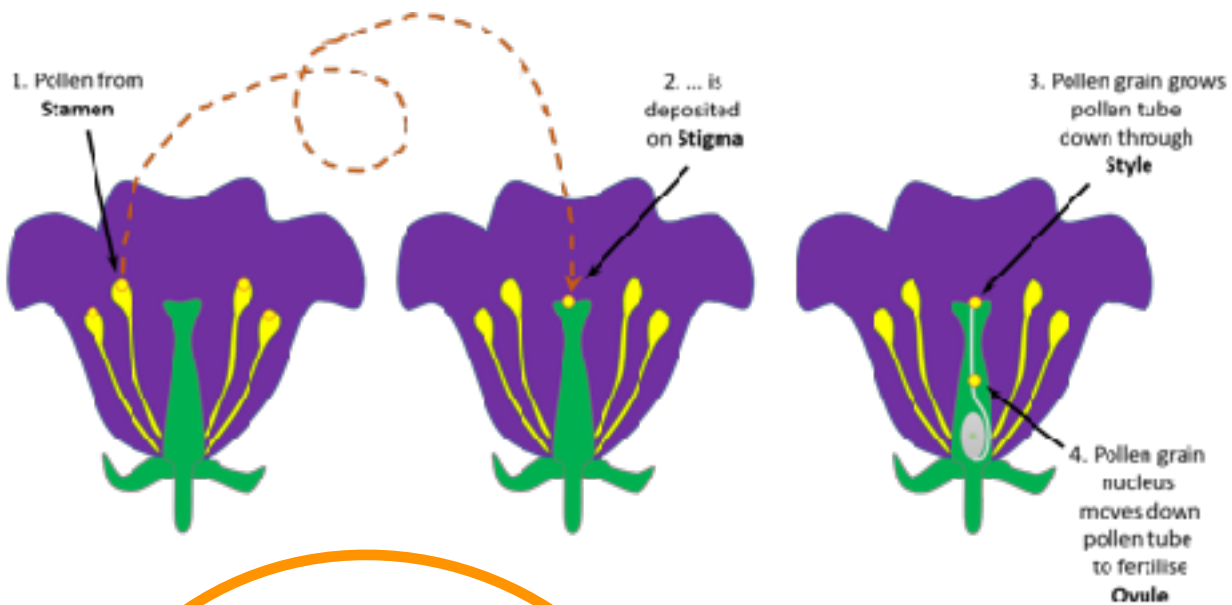
The project is coordinated by the National Biodiversity Data Centre, and the operational group includes, Trinity College Dublin, Bord Bia, Glanbia, Teagasc, Macra na Feirme, HEINEKEN Ireland and four representative farmers across farm types.

Protecting Farmland Pollinators is a European Innovation Partnership (EIP) funded by the Department of Agriculture, Food, and the Marine (DAFM) under the Rural Development Programme 2014-2020.



What is pollination?

Pollination is the movement of pollen from the **stamen** to the **stigma**. This can be done by wind, water or by our pollinators!



Hi, I'm the **Bee of Knowledge**. You'll see me here on some pages for extra fun facts. I'm also here as the judge for competitions which you'll see at the end of newsletters!

Our first fun fact is about pollen. Pollen is a powder that is usually yellow that flowers use it to make seeds that will make new flowers and plants.



Pollination can be **abiotic** or **biotic**

- a. **Abiotic** pollination relies on wind and water to move pollen. Crops like wheat and barley use abiotic pollination and don't need pollinators.
- b. **Biotic** pollination relies on pollinators to move pollen. 87.5%

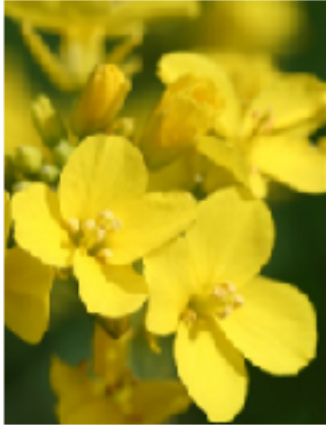
of flowering plants use biotic pollination. Strawberries and apples are important fruit crops in Ireland, and they need animal pollination.

- c. Some plants use both **biotic** and **abiotic** pollination. Examples are oilseed rape and plantain.

Activity 1:

Can you find a plant in your garden or park that uses both abiotic and biotic pollination?

Here are some pictures to help with your plant hunting!



Oilseed Rape (aka *Brassica rapa*)

Plantain (aka *Plantago lanceolata*)

Question time

What plant species did you find?

Where was it growing?

Did you know that some farmers use Plantain to feed cows and sheep? The seeds are sown on fields mixed with grasses and other plants to give livestock extra nutrients. This mix of plants is used by many farmers in Ireland and is called a mixed species sward.





Activity 2: Game – Let's pollinate!

For this game you are going to pretend you are a bee – don't forget to buzz!

What you need to play:

- 20 Pollen grains per player (yellow balls made from different materials e.g. pompons, play dough, yellow paper scrunched up very small).
- 4 Flowers per player (draw, paint, colour 4 flowers).
- Kitchen tongs or tweezers or fingers for younger children.

The aim of the game is to deliver 5 pollen grains to each flower.

How to play:

1. Place the 4 flowers in a row on the floor separated by 40cm (use a ruler or two hands side by side).
2. Number the flowers 1-4 (1 is the closest flower and 4 is the flower furthest away).
3. Place all the pollen grains next to flower 1.
4. Using the tweezers, move the pollen to flower 1. Once this flower has 5 grains move on to the next flower.
5. Only one pollen grain can be moved at a time.
6. If the pollen grain drops outside of a flower it must be brought back to the start.

Additional step to see the difference between abiotic and biotic pollination:

Now it is time to pretend you are the wind!

1. Complete steps 1 to 3 above.
2. You now need to generate a force (for example, wind) to move the pollen grains. You can blow or push or use a stick to move the pollen grains.

Question time – What have you observed?

1. What happened to the pollen grains when they were blown by the wind?
2. What happened when they were moved by the bee?
3. What do you think the benefits are of abiotic pollination (for example by the wind) are?
4. What are the benefits of biotic pollination (for example by the bee)?
5. What are the disadvantages of biotic pollination?

What animals pollinate?

Quick! Name a pollinator! Did you say bee? Would it surprise you if we told you that bees aren't the only pollinators?

Insects

Bees, beetles, butterflies, flies, moths and **wasps** are all important insect pollinators. Bees have tiny hairs on their bodies that pollen sticks to, this is one of the reasons why they are so good at transferring pollen. Other non-bee insects can't pick up as much pollen because their bodies are not as hairy. Insects can be found all over the world except on Antarctica.

Nectar is sugary liquid made by flowers and plants and is used by plants to attract pollinators.



Birds

Birds are pollinators too! Only some countries have pollinating birds. Hummingbirds are great pollinators and live in the tropical and sub-tropical regions of Central and South America. Being a hummingbird is hard work. They need to drink a lot of nectar to get enough energy to keep those tiny wings flapping. When they put their long beaks into flowers to drink the nectar their faces and beaks are dusted with pollen.

Black-and-white ruffed lemurs

The black-and-white ruffed lemur is the largest pollinator in the world! They are the primary pollinator of the Traveller's Tree in Madagascar and it isn't easy getting to its flowers. These lemurs must open up the flower and reach the nectar with their long snout and tongue. While they are drinking the nectar, the pollen they brush up against gets stuck on their fur.



Honey possum

A honey possum is from Australia and is about the size of a mouse. Even though they have honey in their name, they don't actually eat it! They live off nectar. Their nose gets dusted with pollen when they drink the nectar from one flower and the pollen gets passed on when they visit another flower.



Blue-tailed day gecko

This small lizard is found on the island Mauritius (located off the coast of Africa). It is also a key helper in spreading around plant seeds. When they go into eat nectar inside a flower, pollen gets stuck to the scales on their body.

Bats

Fruit Bats are important pollinators in tropical places and deserts. They are responsible for pollinating over 300 fruits, including mangoes, bananas and guavas. They pick up pollen on their face as they drink nectar from a plant.



Which of these pollinators is your favourite?

You might have notice that not all the mentioned pollinators are present in Ireland. The most important pollinators in our country are **insects** helping farmers grow **crops** like apples, strawberries, raspberries, blackcurrants, peppers, courgettes and pumpkins as well as **wildflowers**.

In Ireland we have 21 **bumblebee** species, 77 **solitary** bees and roughly 180 **hoverfly** species!



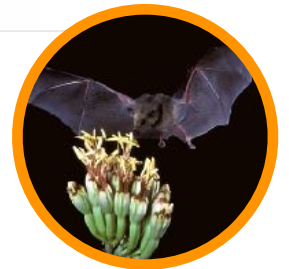
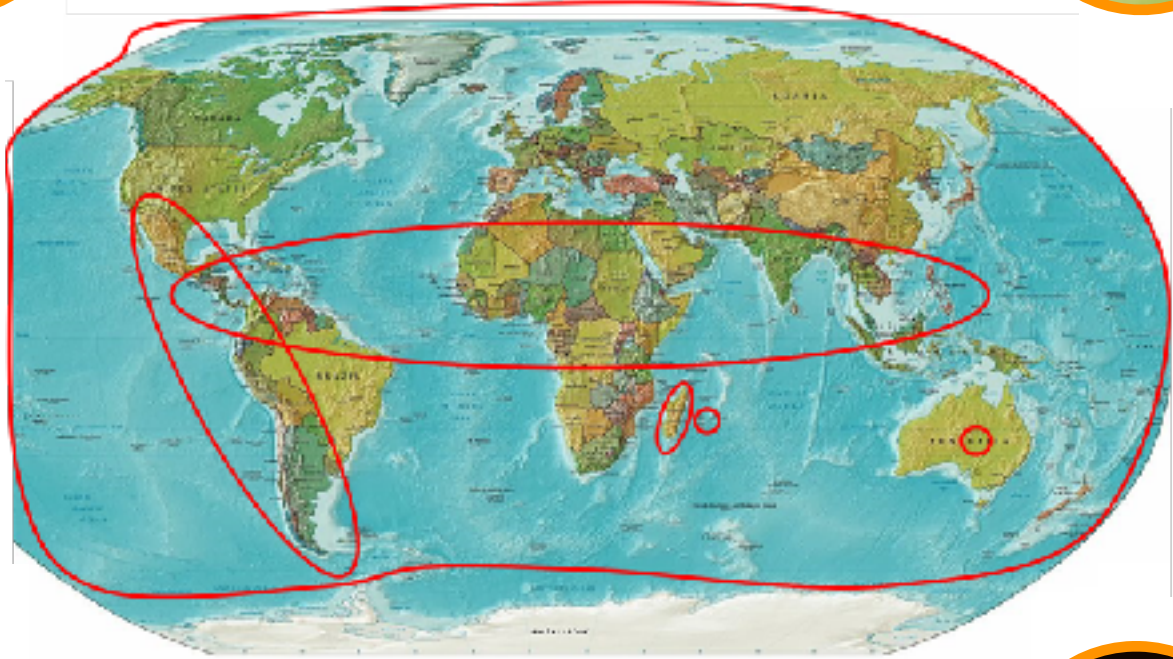
Bumblebee



Solitary Bee



Hoverfly



Did you know that some animals can be nectar robbers. Bees, ants, hummingbirds, birds, bats and even squirrels can be nectar robbers. These animals use their mouthparts to cut a slit at the base of flower and steal nectar without pollinating the flower!



Activity 4: Colour the pollinators in the following pages

Hummingbird



Blue-tailed day gecko



Where does chocolate come from?

Did you know chocolate is made from beans? They are called **Cocoa Beans** and they come from the **Cacao Tree!**



Cocoa beans



Cacao tree

Flowers grow straight out of the trunk!

But the Cacao Tree needs help from some very special insects to make these beans. One of these insects is called the Chocolate Midge!

This little fly is the size of a pinhead is perfect for crawling inside the tiny flowers of the Cacao Tree and pollinating them so the Cocoa Beans can grow. If we didn't have tiny pollinators like our wonderful Chocolate Midge, we wouldn't have our tasty chocolate!



Cacao Trees grow best in hot and humid countries, like those near the Equator (Nigeria, Ghana, Cameroon and the Ivory Coast). Most of our Cocoa Beans come from small family farms, like the ones we have in Ireland. Growing these trees is really hard work as they need a lot of care and they usually don't produce fruit until they are five years old. If you wanted to make 500g of cocoa, you would need around 400 Cocoa Beans!

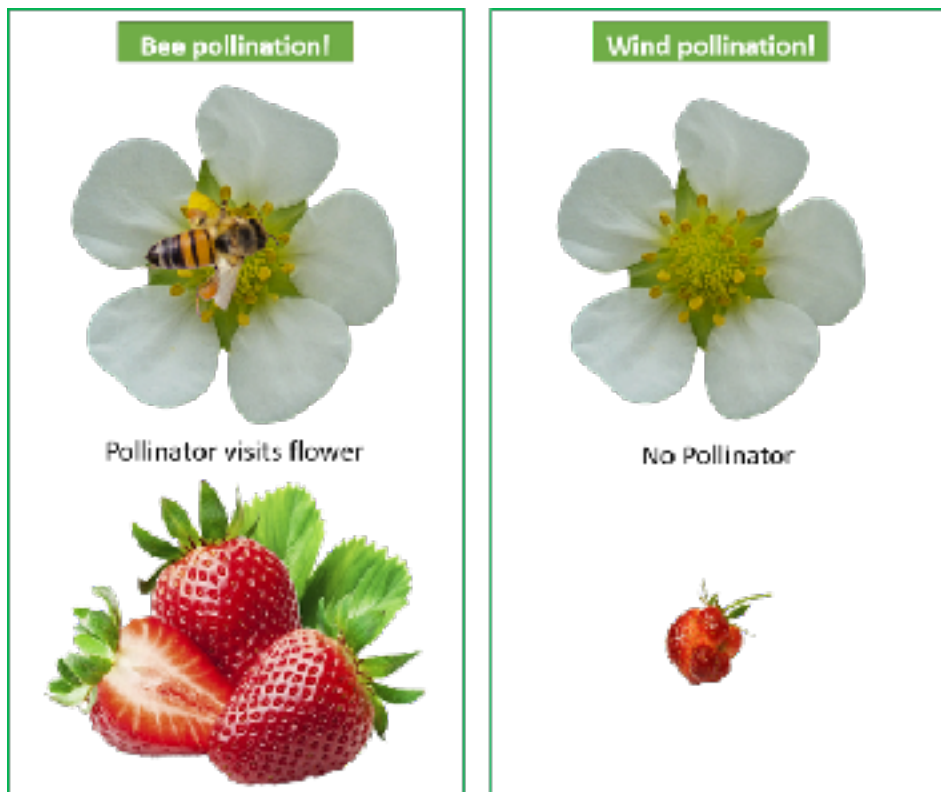
Chocolate didn't make its way to Europe until the 1500s, after America was discovered.



Why is pollination important?

Pollination is important because it allows lots of different fruits and vegetables to grow, and helps plants make lots of seeds so more plants can grow. When bees pollinate strawberry flowers, the strawberries grow better than if only the wind pollinated the plant!

Which strawberry would you rather eat?



In Ireland, insects help us grow:

- Blackcurrants
- Raspberries
- Cucumbers
- Pumpkins
- Blackberries

Did you know that there is a native Irish strawberry? It is the sweetest strawberry you will ever taste and can be found growing beside hedgerows!



Did you know that the honeybee is the only bee that makes honey in Ireland?



Activity 5: Linking Food and Pollination

Count all the different foods in your house that were animal pollinated.
 Count all the different food that was not animal pollinated. One example is milk!
 Which are your favourite foods?
 What food gives you important nutrients and vitamins?
 How important do you think pollinators are?

Irish Corner

Activity 6: Toraíocht focal

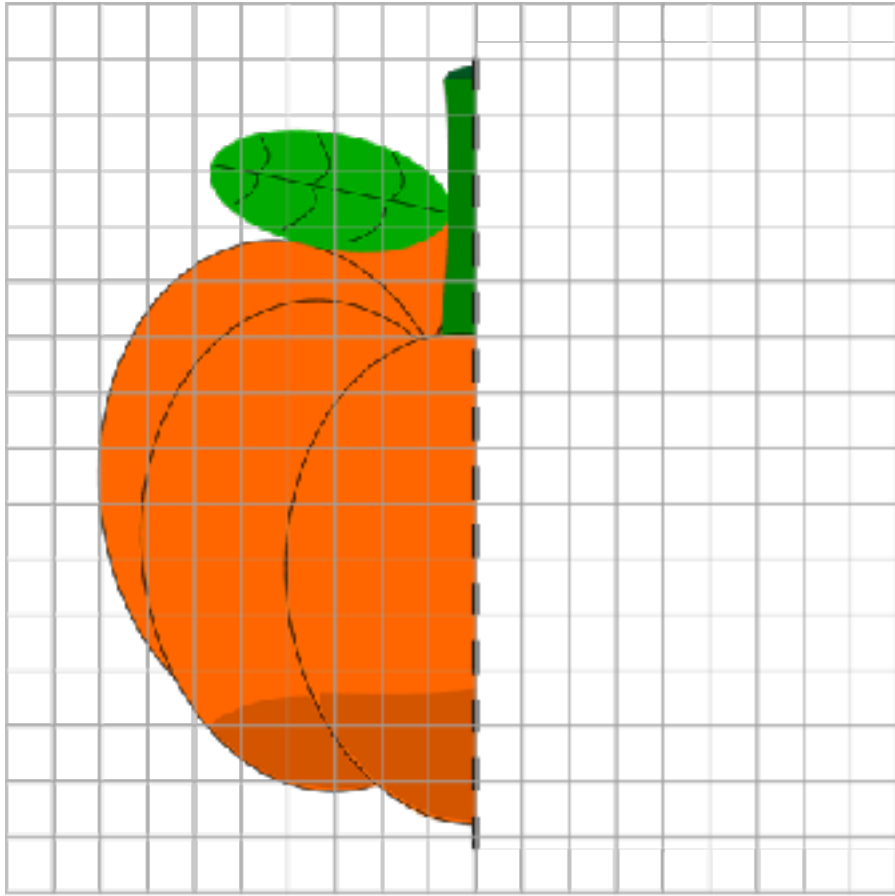
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Bumbóg	Bumblebee	Bláthanna	Flowers
Beach mheala	Honeybee	Seamair	Clover
Beach aonarach	Solitary Bee	Nóinín	Daisy
Beach ghabhair	Hoverfly	Fearbán léana	Buttercup
Pailniú	Pollination	Caisearbhán	Dandelion

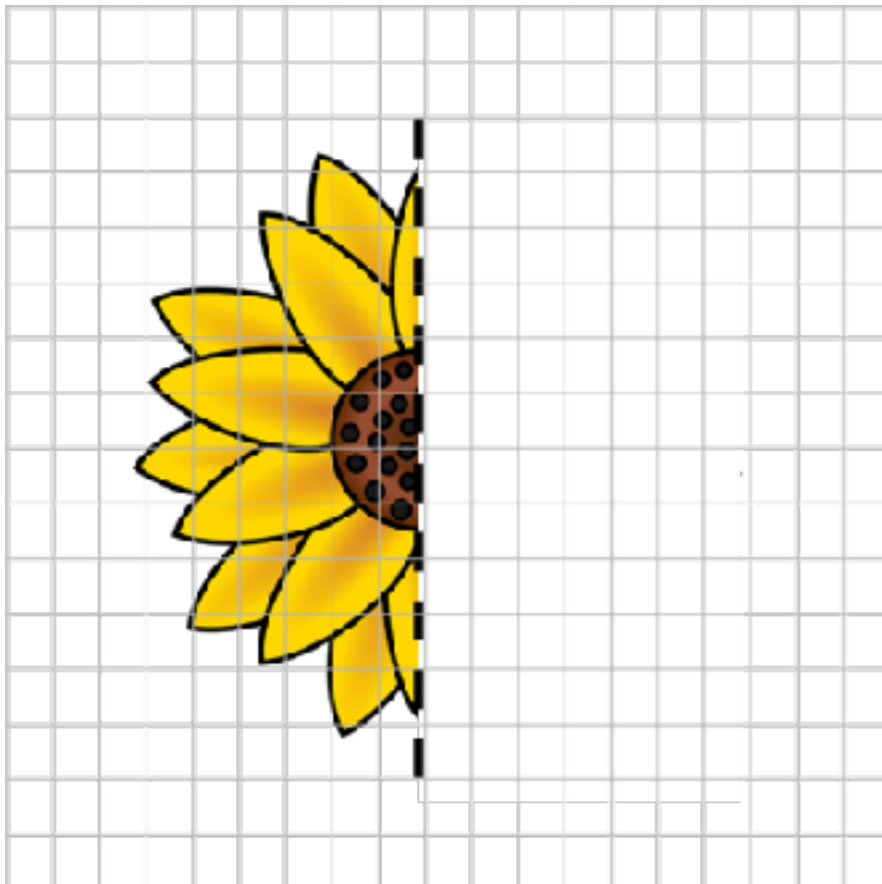
Bee creative!

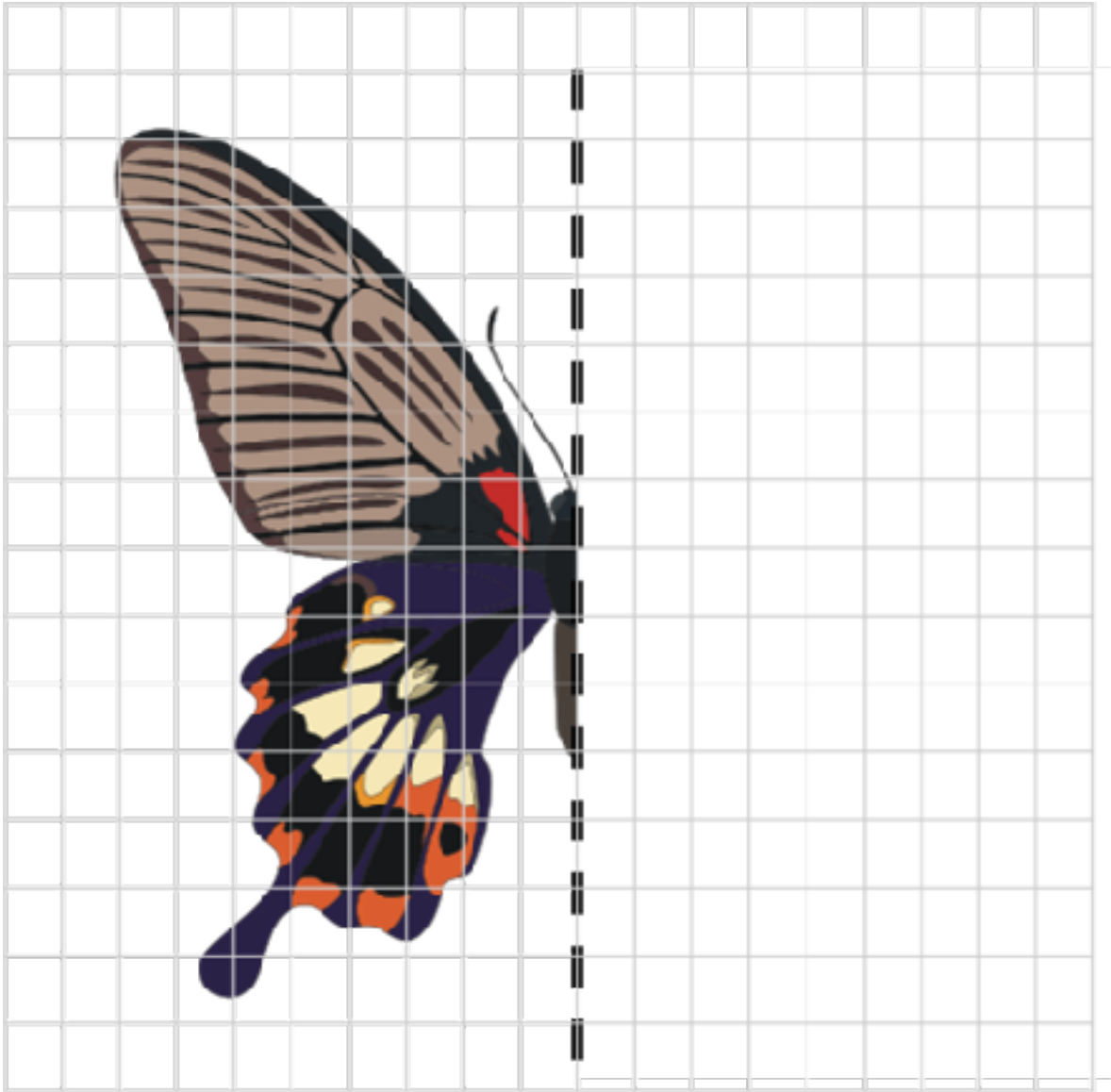
Activity 10: Can you draw the other half?

Pumpkin



Sunflower





It's competition time! We have learned lots of fun facts about pollination in Ireland and now it's time for you to draw a picture. The theme is 'Food, Farming and Nature'.

Take a picture and send it to us at eip@biodiversityireland.ie

We'll announce the winner in the next issue.



Get buzzy!

Equipment

- Paper or card
- Scissors
- Pencil
- 2 Small containers (Tupperware, bowl, box)
- 4 people minimum (2 pollinators and 2 plants (food source for pollinators))
- A timer

Setting up the game

1. Print supplied page with different crop names or prepare your own. Cut or tear the paper on the dashed line. Each torn piece of paper represents pollen that comes from a different fruit, vegetable or grain (crop). Animal pollinated crops have a '✓' placed on them and non-animal pollinated crops have an 'x'.

Animal pollinated crop examples (✓)	Non-animal pollinated crop examples (x)
Strawberry	Cabbage
Apple	Onion
Beans	Broccoli
Pears	Wheat
Blackberry	Barley

2. Decide if you are a pollinator or a plant.
3. There is no limit to the number of players but a minimum of four players is required.
4. Each round lasts 2 minutes - get your stopwatch ready.

Aim of the game

Each pollinator should try to collect as many animal pollinated crops (pieces of paper) as possible.

Cut out these slips of paper with Crop labels.

Strawberry ✓	Strawberry ✓
Apple ✓	Apple ✓
Beans ✓	Beans ✓
Pears ✓	Pears ✓
Blackberry ✓	Blackberry ✓
Cabbage X	Cabbage X
Onion X	Onion X
Broccoli X	Broccoli X
Plum ✓	Plum ✓
Raspberry ✓	Raspberry ✓
Blueberry ✓	Blueberry ✓
Courgette ✓	Courgette ✓
Wheat X	Wheat X
Oats X	Cabbage X
Barley X	Barley X

How to play

Players swap between playing as plants or pollinators.

- a) Plants: Place the crop labelled pieces of paper in pockets (or socks).
 - b) Pollinators: Compete against each other to collect as many animal-pollinated crops as possible.
1. Each pollinator places their empty container on the ground.
 2. Each plant has one crop in their hand at a time while keeping the rest hidden in their pocket (or socks).
 3. Set the timer for 2 minutes.
 4. Pollinators run from their container to a plant and ask them what type of crop they are.
 5. The flower checks the crop name on the paper in their hand and responds honestly.
 6. The pollinator must answer if the plant is animal pollinated or not.
 - a. If the pollinator answers correctly that it is an animal pollinated crop, they can take the crops pollen (piece of paper) back to their container.
 - b. If the pollinator answers correctly that it is not an animal pollinated crop, the plant takes out a new piece of paper from their pocket and again the pollinator must answer if the food is animal pollinated.
 - c. If the pollinator answers incorrectly, the pollinator must fly/buzz to another food source and ask them what plant they are.
 7. Before a plant can take out a new crop for a pollinator to visit, the plant must do 10 jumping jacks (optional).
 8. Pollinators run as fast as they can back and forth between the plants and containers until there are no pieces of paper left or until the time is up.
 9. Record how many pollen grains (pieces of paper) each player collects, the pollinator with the most grains wins!

Protecting Farmland Pollinators



Protecting Farmland Pollinators is a European Innovation Partnership (EIP) funded by the Department of Agriculture, Food, and the Marine (DAFM) under the Rural Development Programme 2014-2020. The project is coordinated by the National Biodiversity Data Centre. The National Biodiversity Data Centre is an Initiative of the Heritage Council and is operated under a service level agreement by Compass Informatics. The data centre is funded by the Department of Culture, Heritage and the Gaeltacht, and the Heritage Council.



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