

Name:



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MEET THE SCIENTISTS



From left to right: graduate student Sarah Scott, Dr. Kayla Perry, Dr. Mary Gardiner, and graduate student Denisha Parker





Why be a DANDELION DETECTIVE?

Did you know that over 4,000 species of bees live in North America? Some of the best-known bees are honey bees and bumble bees that live in colonies. These species have a queen and many workers that take care of the colony by collecting pollen and nectar to feed developing bees, or larvae. There are also many species of solitary bees that do not live together in colonies, but instead build individual

nests in the soil, hollow twigs, or even in wooden decks or roofs! All bees rely on flowers that produce pollen and nectar as their food source and need to collect these resources to feed their developing larvae. Bees get the energy they need from the carbohydrates in nectar, and the protein they need to grow from pollen. As bees collect pollen and nectar from flowers, they provide humans with a critical ecosystem service by pollinating our crops and the trees and flowers we see outside. Without bees, our forests and gardens would lose many types of plants, and we would not be able to eat fruits, vegetables, or nuts like apples, squash, or almonds.

Unfortunately, many types of bees are declining in the United States and scientists want to know why! One possibility is that bees do not have enough food to eat. Weeds could be an important food source for bees and other insects like butterflies, beetles and ants. We need your help as part of our scientific team to see if bees and other insects will feed from common weeds in a yard. If so, these weeds might not be all bad after all! Will you join our team and become a **Dandelion Detective**?





REGISTER AS A DANDELION DETECTIVE

Register as a Dandelion Detective to recieve your badge number. This number will allow us to anonymously track all the data you collect as part of our citizen science program.



Go to **http://u.osu.edu/dandeliondetectives/** to get your detective badge number.



From the homepage, click on the 'Headquarters' tab and then click on the 'Become a Dandelion Detective' button.



Complete our pre-experiment survey questions BEFORE you begin the experiment.



Write your badge number in the space below. You will need this number to submit your data.

DANDELION DETECTIVE BADGE NUMBER:

UNPACKING YOUR TOOLKIT



PICK A DAY TO CONDUCT YOUR EXPERIMENT

This project can be completed on any partly to mostly sunny day in June, July, or August. You will be collecting your data from **9am until 3pm.**

Fill out the table below before you start!



SET UP YOUR OBSERVATION DANDELION (9:00AM)

Prepare the nectar



In the morning on your experiment day, prepare the nectar by mixing 1 cup of sugar and 1 cup of water in a small sauce pan. With help from an adult, warm the nectar solution with low heat on the stove-top. Stir constantly until the sugar has dissolved. You have created food for insects! Make additional nectar as needed to keep your Observation Dandelion full throughout the experiment.

"Plant" your Observation Dandelion



Find an area of cut grass that is in full sun. To create your Observation Dandelion, place the yellow sponge in the clear plastic bottle on the grass and pour in the nectar. Fill the bottle with nectar until it reaches the top of the sponge. You want your sponge to be floating so that the insects can feed on the nectar and not drown! Next, place the yellow paper funnel in the jar so the bottom is a few inches away from the sponge, then tape the funnel to the jar. Plant your Observation Dandelion at 9:00 am and leave it in place until 3:00 pm to allow bees and other insects to discover this new nectar food source.

COLLECT YARD WEED DATA

(Collect after setting up observation dandelion)

How many flowering weeds are in your yard? Collect data from THREE areas of your yard by completing the steps below.

Many people do not have a front or backyard at their home. You can conduct this study anywhere you find mown grass, like a park, playground, or community center.



Stand in the middle of your front or backyard, whichever area is larger. Throw a pencil with a flagging ribbon tied to it behind your back to find your first Weed Survey Station.

Unfold your rope square so that the pencil is in the center. Use popsicle sticks to hold the 4 corners in place.

- Remove the pencil. Place the numbered square (1, 2, or 3) from your kit in the corner of the square to label each round of data collection.
- Take a photo where you can see all the weeds inside the square and the number label. You will send this photo to Dandelion Detectives Headquarters!
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Use your weed guide and identify any blooming weeds present. Record the type of weed and the number of flowers on your data sheet. No flowers? That's just fine! Record a zero on your data sheet.

To find the next Weed Survey location, stand next to your rope square and throw the pencil behind your back. Collect data from three Weed Survey Stations total.

Being a Good Scientist

Throwing the pencil like this to figure out where to collect your weed data is what scientists call "random sampling". This method prevents us from picking the best-looking or worstlooking area of the yard. If your pencil does not land in the grass, try again!

COLLECT INSECT DATA (3:00 рм)

Collect data from your Observation Dandelion by following the three steps below.



At 3:00 pm approach your Observation Dandelion. Carefully remove the funnel and screw on the jar lid. Carefully pick it up and place it on a table where you can observe any insects.



Examine the Observation Dandelion carefully, as many insects are very small. Use your Insect Guide to identify each insect to Order and Family. Add your identifications to your Insect Data Sheet.

Take one photo of each insect you find using a smart phone or digital camera. Try to get a focused, close-up photo.

No camera, no problem!

You can skip step three. If you want, you can send drawings of the insects you see! Just make a PDF of your drawings and upload them instead of photos!





Release your insects back into your lawn by removing the jar lid and placing the plastic container back into the grass. If needed, a small paintbrush works great to move insects from the sponge back onto the grass!

WEED DATA SHEET

Record the number of each weed species you see. If you are unsure of what species a weed is, that's okay! Just write "unknown".



SAMPLE ROUND 1	TIME:	
SPECIES OF WEED	# OF FLOWERS	
1. EX: Dandelion	3	
2.		
3.		
4.		
5.		
6.		
TOTAL:		

SAMPLE ROUND 2	TIME:
SPECIES OF WEED	# OF FLOWERS
1.	
2.	
3.	
4.	
5.	
6.	
TOTAL:	

SAMPLE ROUND 3	TIME:
SPECIES OF WEED	# OF FLOWERS
1.	
2.	
3.	
4.	
5.	
6.	
TOTAL:	

WEED SURVEY QUESTIONS

Answer the following questions for each sampling round

Weed Survey Round 1

HOW MANY DIFFERENT SPECIES OF WEEDS? ______

HOW MANY INDIVIDUAL FLOWERS? _____

NOTICE ANYTHING INTERESTING? _____

Find a new spot, toss your pencil to find the next area to collect data!

Weed Survey Round 2
HOW MANY DIFFERENT SPECIES OF WEEDS?
HOW MANY INDIVIDUAL FLOWERS?
NOTICE ANYTHING INTERESTING?

Find a new spot, toss your pencil to find the next area to collect data!

Weed Survey Round 3

HOW MANY DIFFERENT SPECIES OF WEEDS? ______

HOW MANY INDIVIDUAL FLOWERS?

NOTICE ANYTHING INTERESTING? _____

INSECT DATA SHEET

OBSERVATION	TIME:	
ORDER OF INSECT	# OF INSECTS	
1. EX: Hymenoptera: Formicidae (Ant)	4	
2.		
3.		
4.		
5.		
6.		
TOTAL:		

INSECT SURVEY QUESTIONS

Answer the following questions for the sampling round

OBSERVATION

HOW MANY DIFFERENT ORDERS OF INSECTS DID YOU FIND?

HOW MANY FAMILIES?

DID YOU FIND ANYTHING YOU COULD NOT IDENTIFY? DESCRIBE IT HERE:



SEND YOUR FINDINGS TO DANDELION DETECTIVE HEADQUARTERS

Interview your parents or guardians!

Ask your parents or guardians the questions below about how they take care of your yard! If it is a public park or community center, find an adult in charge to interview!

1. How many times a month do you mow the grass?

- 2. Do you apply fertilizer to the yard? _____
- 3. Do you use herbicides to control weeds?

How often? ______

- 4. Do you hire a company to provide weed control for your yard? _____
- 5. Because of this study, are you willing to leave a few dandelions in the yard for

bees and other insects? _____

Submit your data

After you finish the experiment, head to our website to enter your data.



From the homepage, click on the 'Headquarters' tab.

- Click on the 'Submit your Data' button to take the postexperiment survey and enter your data. You will need your Dandelion Detective badge number!
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Once you have completed the survey, another link will take you to the data entry website.

Enter your Dandelion Detective badge number and data from your laboratory notebook into the fillable form. Upload your weed and insect photos. We are excited to see what you observed!





THANK YOU!

Thank you for participating! Look over your data, is your yard a pollinator friendly habitat? What can you do to improve your yard for bees?









