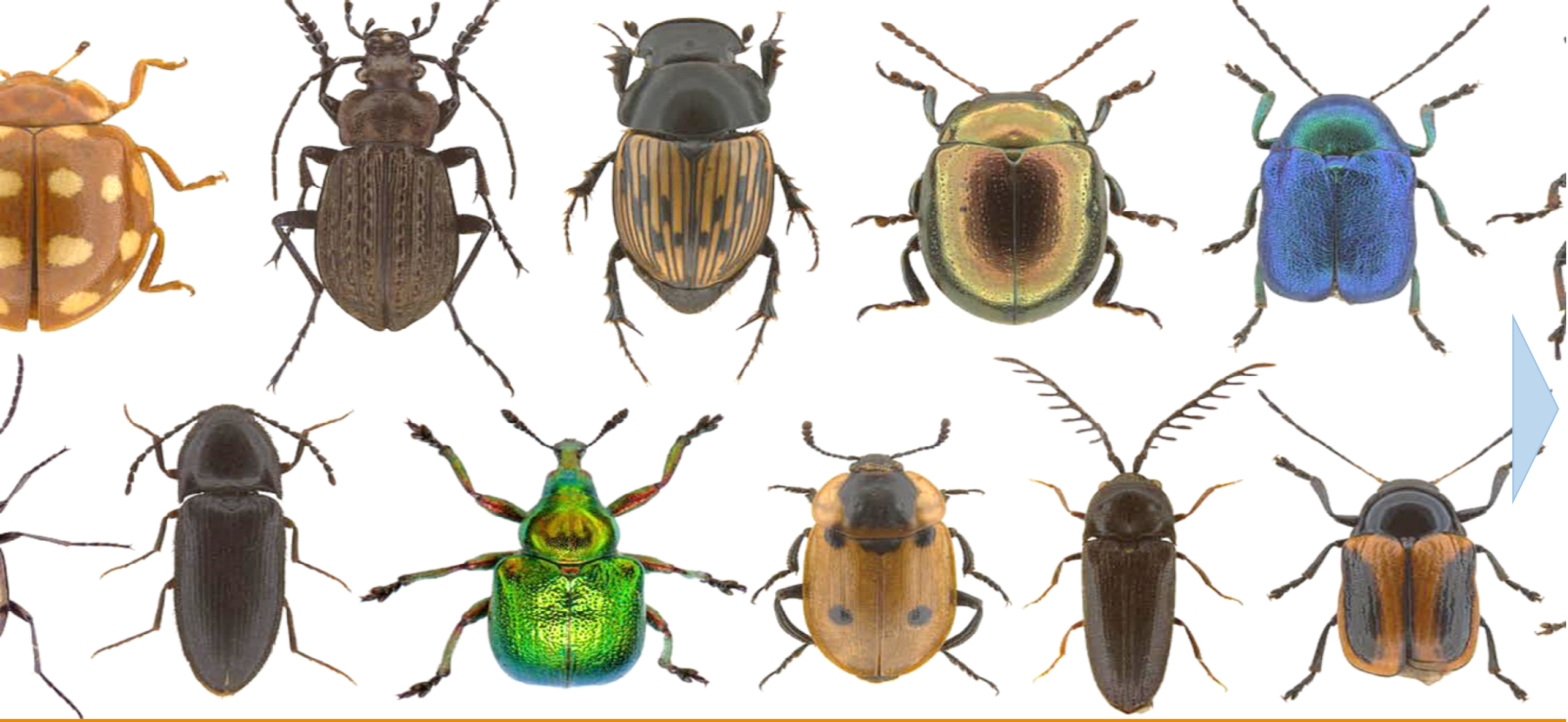


HOPE
FOR THE FUTURE

Bee experiment: time of day

Bee experiments to do at home…

Q. You might describe yourself as a night owl or morning person. Are bees busier at certain times of day? Try this experiment to find out?

First, get to know your bees…
There are lots of websites that help you identify common garden bees. Here area two:
https://friendsoftheearth.uk/bees/bee-identification-guide https://www.bbowt.org.uk/different-kinds-bees

Choose a plant in your garden
that the bees like to visit.
This is a rosemary plant.

Have a plan before you start. Here is a suggestion….

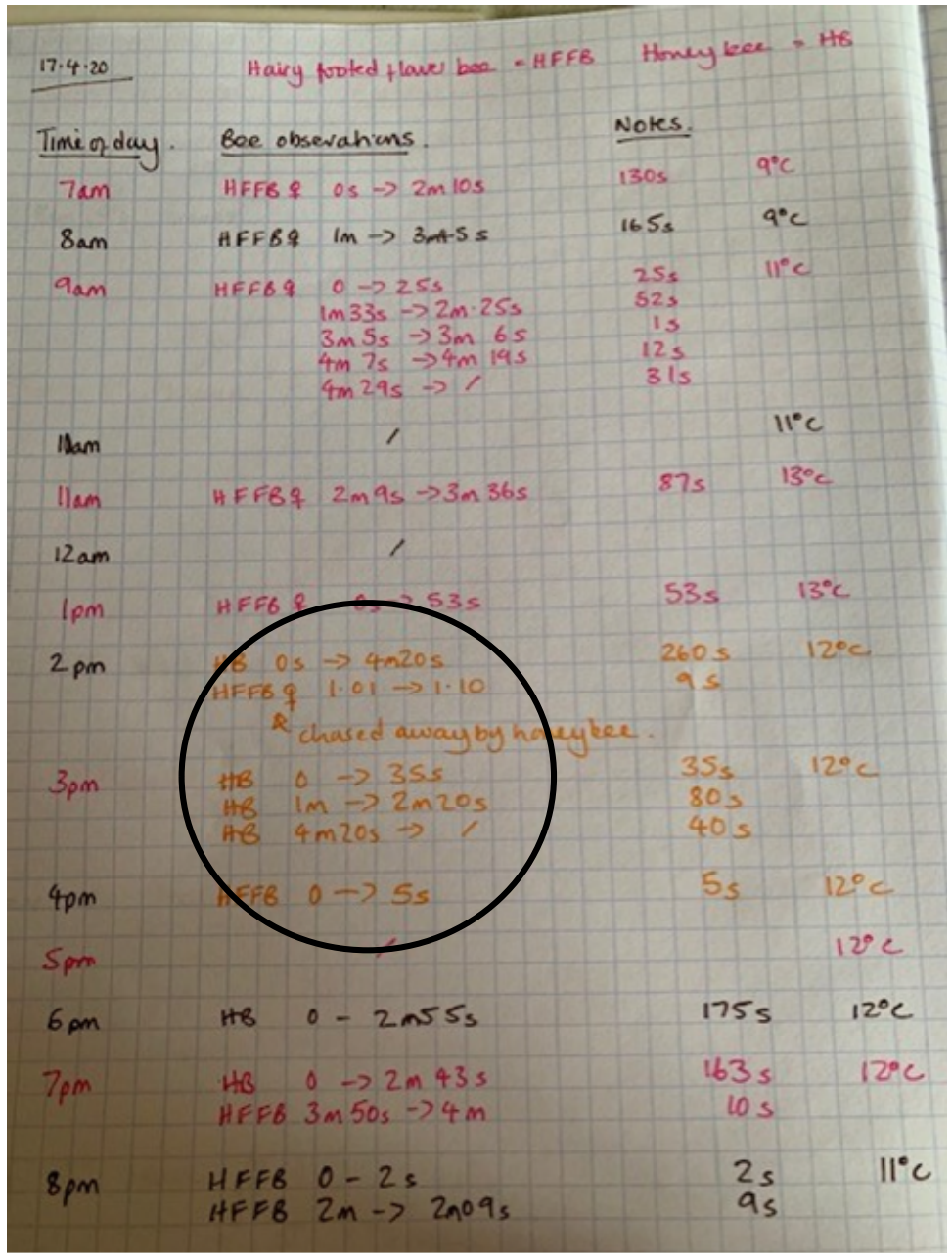
- **Set aside 5 minutes at the same time each hour throughout a particular day.**
- **Sit beside your chosen plant with a stop watch for 5 minutes and watch for bees.**
- **When a bee visits, record what species it is or features that will help you identify the species later.**
- **Note the time when it arrives to feed on the plant and the time when it leaves.**

Make a note of other things you notice, for example other bee species seen in the garden during the five minute recording time. Also make a note of the temperature and simple weather conditions. Is it still, breezy or windy?

This table might help.

Time / Date	Conditions	Bee species	Time foraging Start / End	Notes

Here are some results I recorded on the rosemary plant on 17th April 2020



17·4·20 Hairy footed flower bee = HFFB Honey bee = HB

Time of day	Bee observations	Notes	
7am	HFFB ♀ 0s → 2m 10s	130s	9°C
8am	HFFB ♀ 1m → 3m 5s	165s	9°C
9am	HFFB ♀ 0 → 25s	25s	11°C
	1m 33s → 2m 25s	52s	
	3m 5s → 3m 6s	1s	
	4m 7s → 4m 19s	12s	
	4m 29s → /	81s	
10am	/		11°C
11am	HFFB ♀ 2m 9s → 3m 36s	87s	13°C
12am	/		
1pm	HFFB ♀ [illegible] 53s	53s	13°C
2pm	HB 0s → 4m 20s	260s	12°C
	HFFB ♀ 1·01 → 1·10	9s	
	& chased away by honeybee.		
3pm	HB 0 → 35s	35s	12°C
	HB 1m → 2m 20s	80s	
	HB 4m 20s → /	40s	
4pm	HFFB 0 → 5s	5s	12°C
5pm	/		12°C
6pm	HB 0 - 2m 55s	175s	12°C
7pm	HB 0 → 2m 43s	163s	12°C
	HFFB 3m 50s → 4m	10s	
8pm	HFFB 0 - 2s	2s	11°C
	HFFB 2m → 2m 09s	9s	

That day two species visited. They were the hairy-footed flower bee (*Anthophora plumipes)* and the honey bee (*Apis mellifera)*.

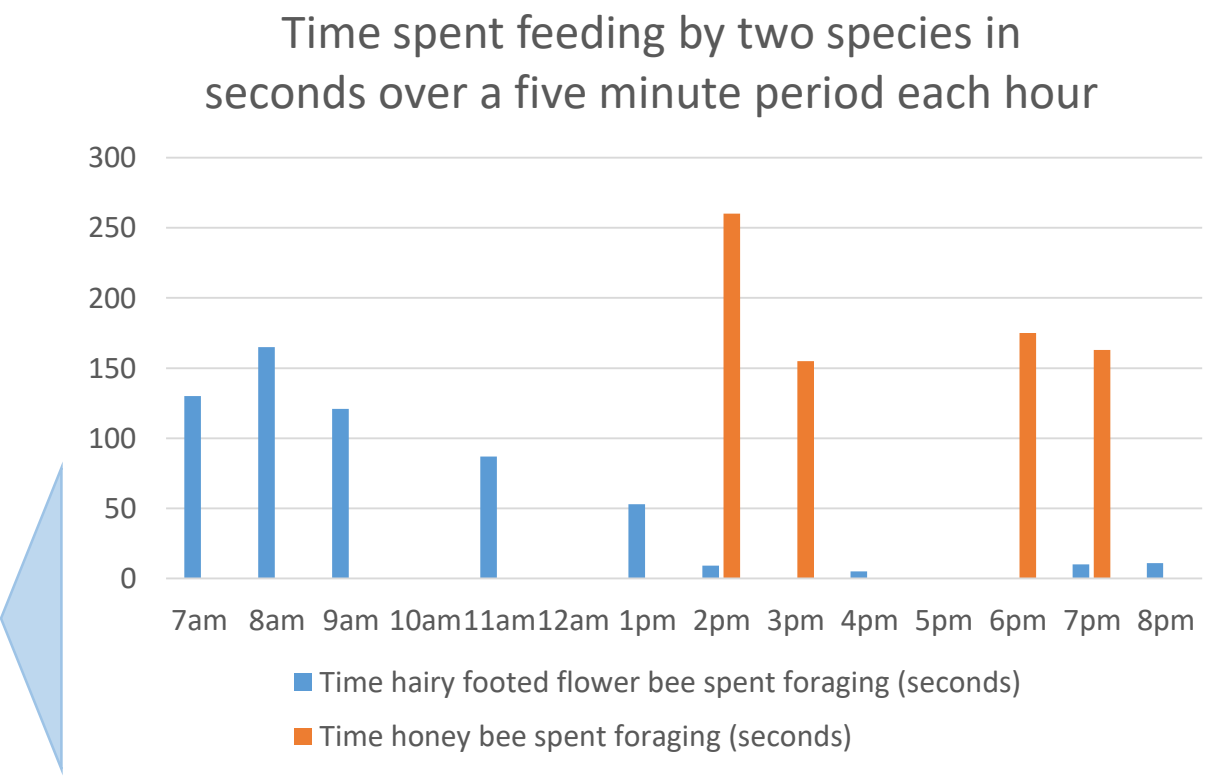
The hairy-footed flower bee is a solitary bee and lives on its own.

The honey bee is a social bee and lives with other bees

The two species were only seen on the rosemary plant at the same time once. When both species where foraging at the same time the honey bee chased the hairy footed flower bee away. There were never two bees of the same species on the plant at the same time. (I suspect the same individual bee was coming back to the plant over and over again.)

I don't think the times they were foraging were synchronised to avoid competition. I think the flower bee was driven away by the honey bee. The day before I'd noticed the flower bee was feeding in the afternoon. The honey bee wasn't around that day.

Here are the results



The total number of visits during the survey period:

flower bee **14** honey bee **6**

The average time for each visit is:

flower bee **42 seconds** honey bee **126 seconds**

The total amount of time feeding on the plant:

flower bee **591 seconds** honey bee **753 seconds**

So the flower bee visited more frequently but visits were shorter. The flower bee spends less time on the plant and has more time to discover new food sources. Could this be important for all solitary bees? Because they can't share information about rich food sources, they might need to spend more time exploring and less time feeding.

This made curious. What would happen if I moved the plant to the other side of the house? If the flower bee really explores more and feeds less, then the flower bee might find the rosemary plant first. I moved the plant once it went dark and then checked the plant each hour the next day. Its was pretty quiet until 2pm, when the first bee was spotted. It was a…honey bee. The honey bee was joined by 2 more honey bees and they stayed around until it went dark. The flower bee wasn't seen that day (I'd better move the plant back!)

Feeding behaviour in bees may be affected by some pesticides called neonicotinoids. Honeybees exposed to low levels of these pesticides spend less time feeding. Over a long period a lack of food causes a hive of bees to decline and become more susceptible to other pressures. Rather than relying on a handful of chemicals like neonicotinoids, farmers are now encouraged to use a range of methods to control pests. This includes using natural predators (biological control) and organic methods. By using chemicals in a very precise and targeted way when absolutely necessary, it is hoped that their impact on bees and the environment can be minimised. See here for more information.

Things to do next

Make changes and improvements to this investigation and try it again.

Plan and conduct your own investigation.

Take part in a citizen science project, contributing to real life research. The BBC website has some good information on what is out there.

Acknowledgements

We hope you enjoyed learning about insects. This is one of a series of resources from the HOPE collection of British insects at the University of Oxford Museum of Natural History.

You can find more about the Hope for the Future Project on our website: oumnh.ox.ac.uk/hope-future

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Museum of Natural History

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