

Investigating biodiversity

Overview:

Discover how insects are helping increase the Earth's biodiversity.

Biodiversity is important for healthy environments, as well as a healthy human population. In this activity volunteers take on the role of pollinating insects. They must collect as much pollen from their designated flower as possible in a set time. The pollen is then added to the biodiversity indicator demonstrating to the audience that we need a wide variety of pollinators to ensure a rich and diverse ecosystem.

Programme use:

Family Show.

Equipment:

- Biodiversity tube x 1.
- Biodiversity level marker x 1.
- Insect costumes antennae and wings (Bee x 1, Wasp x 1, Fly x 1, Butterfly /Moth x1).
- Bees - antennae, 1 pair of wings, Fly - antennae, 1 pair of wings, Butterfly/Moth - antennae, 1 pair of wings. Wasp - antennae, 1 pair of wings.
- Gloves x 4.
- Pollen balls x 100.
- Flower buckets x 4 - 2 of each colour.
- 4 Large flowers and flower stands.

Main stories

An environment with a natural diversity of different species and habitats provides ecosystem services that humans all benefit from such as fresh water, clean air and the



natural pollination of crops.

There are many threats to biodiversity on Earth, most of which are the result of human activity and population growth. This includes habitat loss and fragmentation, climate change, overexploitation of particular species, the introduction of invasive species, pollution and the use of agricultural pesticides.

Scientists across the globe are studying and monitoring biodiversity, finding ways to encourage biodiversity and minimise loss. A key part of understanding biodiversity on land is to monitor the insects in an environment. The abundance and diversity of insects in an area, the critical roles they play in the ecosystem and their sensitivity to environmental change, make them useful indicators.

Insects play an important role as pollinators. Around 80% of UK plants are pollinated by insects, including a large number of our crops. Pollinators help increase plant diversity, and help plants produce food for other animals, including humans.

Bees are well known pollinators, but other insects like flies, beetles, butterflies and moths are just as important. Most insect pollinators visit flowers in order to feed on the nectar the plant produces. Some

pollinators visit particular plants, whilst others visit multiple species of flowers and pollinate a wide variety of different plants in an area. Humans can encourage pollinators to visit and thrive in an area by growing the right type of flowers. You can do this in your garden or local park by growing insect friendly plants, leaving wild spaces and if possible, adding a water feature like a pond.

One of the ways in which people can make a difference is to help scientists monitor biodiversity by recording the insects they see, such as pollinators. There are many apps that can help identify species and offer a platform for recording what you see.

How does it work?

This activity investigates how more insects pollinating an area will increase biodiversity. The biodiversity level in this activity is represented by how full the 'biodiversity tube' is.

The area in question is represented by satellite images showing very little vegetation and therefore, low biodiversity.

Before the show:

1. Prepare the separate insect costumes (wings, antennae and gloves).
2. Attach the biodiversity marker to the pollen tube (low down).
3. Place one bucket at the base of each the large flowers of the corresponding colour and place 20 pollen balls into each of the buckets.
4. Set up the remaining buckets approximately 3 metres away from the flowers and near the biodiversity tube, ready to bring out when needed.



During the Show:

1. Show the audience the satellite images taken of Earth. One shows a high biodiversity area and the other, an area of low biodiversity.
2. Explain that we need an expert opinion from an environmental scientist to work out why they are different.
3. Play the NERC scientist video on the powerpoint slides. The environmental scientist explains that there is low biodiversity. They explain that a good way to counter this is to attract more insects to an area, especially pollinators.
4. Invite four volunteers on stage to help show the how insects can increase biodiversity.
5. Hand out insect outfits to the volunteers, explaining what insects they are representing and why we need many different species in an area.
6. Place the biodiversity tube in the centre of the stage and explain that the tube represents the current level of biodiversity as shown on the satellite images. Make sure that the biodiversity marker is low down on the tube.
7. Set up the four flowers and buckets at one end of the stage at an equal distance from the central biodiversity tube. Place the four other buckets next to the central biodiversity tube.



8. Explain that we are going to raise the level of biodiversity by increasing the pollination taking place. Each of the volunteer insects need to collect pollen from the bucket next to particular coloured flower, using only the fuzzy gloves and any dropped pollen has to be left.

9. Start the timer and give the volunteers 30 seconds to collect as much pollen as they can without running.

10. Stop the pollination after 30 seconds and count how many pollen balls have been collected by each pollinator, then deposit them into the central biodiversity tube.

11. Highlight how much the biodiversity level has gone up as a result of the pollination that has taken place and adjust the biodiversity marker on the tube accordingly. Briefly highlight some of the foods that grow as a result of the pollination.

12. Thank the volunteers and send them back to their seats.

Key take home messages:

- Biodiverse ecosystems are healthy ecosystems.
- Insects play many important roles, including pollination.
- More pollination can lead to greater biodiversity in an area.
- A lot of the food and crops we eat are pollinated by insects.
- Humans can all play a part in encouraging pollinators to our parks and gardens.

