**STUDENT ACTIVITY: Establishing butterfly transects**

**Activity idea**

In this activity, students set up and walk a transect to observe and record butterfly sightings. They act as citizen scientists to monitor changes in the local environment.

By the end of this activity, students should be able to:

* know what a transect is and why they are used for monitoring
* appreciate the importance of systematic observation (the act of noting and recording something) rather than merely looking
* understand that collection of data over a number of years provides scientists with information about a species’ population size and provides information on population decline or increase
* appreciate that citizen scientists work in partnership with scientists to answer interesting and relevant questions.

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**Introduction/background**

A transect is a predetermined path that a person follows in order to obtain a sample or record observations.

In New Zealand, transects are used on land and in the water to monitor biodiversity and population size, record food sources and study pest eradication. How long the transect is and how often it is monitored depends upon the researcher, the research goals and established protocols. Some transects are regularly monitored for decades. For example, the Department of Conservation established a transect line in Takahē Valley, Fiordland, in 1972. It is monitored annually to measure tussock seed food sources for the endangered takahē.

For this activity, students are asked to identify an area within their school community that would be suitable for observing butterflies. They establish the starting point and the end point for a transect and determine how often to monitor it. The Moths and Butterflies New Zealand Trust recommends a weekly walk on warm, dry, sunny days during March–October.

Butterflies prefer weeds and gardens to neat and tidy lawns so a transect along a fence line is likely to produce more sightings than a transect through a playing field.

Two students stand next to each other about 5 metres apart. They imagine they are at the back edge of an invisible 5-metre square ‘box’ with the front edge 5 metres ahead. They walk the transect from the starting point to the end point at a steady pace, recording every butterfly that enters their ‘box’.

Students record butterfly sightings on the [Butterfly sighting data record sheet](#data) and take photos (optional).

Log butterfly sightings over the course of a season and/or seasons to note species’ population size and abundance. Butterflies react very quickly to changes in their environment which makes them excellent biodiversity indicators.

Consider how you might use the data yourself as part of your class’s numeracy programme.

**What you need**

* Copies of the [Butterfly sighting data record sheet](#data)
* Access to the [New Zealand native butterflies](https://www.sciencelearn.org.nz/embeds/56-new-zealand-native-butterflies) slideshow
* Map of your school community (optional)
* Photos of monarch, white or other butterflies common to your area for the model transect walk – use the [New Zealand butterfly families](https://www.sciencelearn.org.nz/embeds/94-new-zealand-butterfly-families-slideshow) – slideshow for images (optional)
* Digital camera (optional)

**What to do**

1. Discuss what a transect is. Ask students if they have seen transect markers while on bushwalks. (Transects are often marked by fluorescent pink or green ribbons leading away from Department of Conservation tracks. These transects are used to monitor traps, tracking tunnels, species counts and so on.)
2. Ask students to think about suitable locations for a butterfly transect within the school community. Factors to consider include food sources/vegetation and butterfly habitats. Consider whether a transect through the immediate neighbourhood may be more appropriate.
3. Determine the transect line or route. Classes may construct several transects. The length can be between 100–1,000 metres.
4. Ask students to consider what conditions are best for walking the transect. Remember that seasonality, weather conditions and temperature make a difference to butterfly presence and activity.
5. Discuss the difference between looking and systematically observing. Is the butterfly resting on a plant, feeding on a flower or flying? Is it a male or female? You can practise observations by walking a model transect. Place photos of monarch and white butterflies along the transect, challenging the students to look carefully to find them and to record their sightings on the [Butterfly sighting data record sheet](#data).
6. Working in pairs, get 2 students to stand next to each other about 5 metres apart. They imagine they are at the back edge of an invisible 5-metre square ‘box’ with the front edge 5 metres ahead. They walk the transect from the starting point to the end point at a steady pace, recording every butterfly that enters their ‘box’. Measure out the imaginary ‘box’ so students have an idea of what it looks and feels like. Remind them to only include data from within this ‘box’. Butterflies they see outside of the box (i.e. across the street) are not to be recorded, nor are butterflies that are behind the student.
7. Have students walk the transect, recording butterfly sightings and behaviours. Use the camera to photograph native butterflies for identification back in the classroom.

**Discussion questions**

* Did you record any butterflies along your transect? What can this information tell you (even if you didn’t see any butterflies)?
* Why do you think you might record this data during a defined time period (each day, week or month)? Do you think you will record identical data each time you walk your transect?
* How might data collected over several seasons provide information about your local area? For example: changes to food sources, host plants (i.e. swan plants or brassicas) and pests?

**Butterfly sighting data record sheet**

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| --- | --- |
| **Your name:** | **Transect address:** |
| **Species** (e.g. monarch, white) MBNZT tag number if present. | **Type of tree/foliage the butterfly is on/near**) | **Date and time** | **Weather** (e.g. warm, cloudy, still) | **Temperature** (if known) | **Description of behaviour** (e.g. resting, flying) |
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