Lesson Four:
Comparing Forest Ecosystems

Royal Geographical Society
with IBG
Advancing geography
and geographical learning

Objectives

- To undertake a statistical analysis related to species abundance

- To understand what the results of a statistical analysis mean for biodiversity

- To be able to plan a method for measuring species abundance in the field

Context and Rationale

This lesson gives students the opportunity to draw comparisons between the two biomes under consideration: the tropical rainforest and the temperate woodland through a statistical analysis test called Simpson's Diversity Index. This test looks at how species diverse a given area is within each of the biomes. Students who are less confident in their maths skills should be reassured from the start that the mathematics involved is relatively straight forward – this will avoid student disengagement with the geography.

Students will also practice using data description terminology in relation to climate graphs as well as design a methodology for sampling species abundance in the field.

This lesson is also presented as a walk-through PowerPoint presentation **'Lesson Four Walkthrough'**.

Starter

Based on revision of the learning in the previous lesson, students can formulate a written comparative description of the climate graphs presented in **'Temperate and Tropical Climate Graphs'**. It may be helpful for students with weaker language skills to have a comparative language word bank ready to use and to help them make a true comparison between the graphs. Students are given some moments to revise the definition of mean, mode and median and then these measures can be calculated for each of the climate graphs. Students can then see what differences there are between each of the three figures and this can also lead to a discussion about which method they favour, which is most accurate and why.

With this new data, students can compare the two climates in more detail and edit their previous written description accordingly to include the use of statistics.

Body

Before the task begins, students can be asked to make a prediction or hypothesis regarding the relative biodiversity of the two biomes. Students can then be given **'Simpson's Diversity Index'** which gives the species details for temperate woodland and step by step instructions for calculating the Simpson's Diversity Index for this habitat. Students can then compare the Simpson's Diversity Index value for temperate woodland with that of a tropical rainforest which has already been calculated. Step by step instructions can also be followed through **'Simpson's Diversity Index Presentation'**.

Plenary

If available, students can be shown a selection of fieldwork equipment, (or shown **'Sampling Equipment Presentation'**) and as a Think, Pair, Share exercise, asked to come up with a method for measuring the abundance of species in a given area. This can then be demonstrated in the classroom. Stronger students can be challenged to think about sampling strategy as well as key ways in which a fair and accurate set of data can be achieved.

Homework or Extension / Enrichment Tasks

Students can predict the levels of faunal diversity given the Simpson's Diversity Index results for each biome. This prediction can be subdivided into insect, bird and mammal species to allow students to think about the different trophic levels of each ecosystem. It can also lead into a separate discussion about ecological niches that different species occupy.

Differentiation Possibilities

Alternative resources are available for students with SEND, EAL, and those with less confidence in the subject matter:

'Alternative Lesson Four Walkthrough'

'Alternative Temperate and Tropical Climate Graphs'

'Alternative Simpson's Diversity Index'

'Alternative Simpson's Diversity Index Presentation'