Project Plan:
Tree diversity & woodland structure

In this Project Plan, we outline a field study that can be carried out over 1-2 hours, followed by a simple analysis and graphical presentation of the data collected.

This project is suitable for Key Stage 3, but individual parts of the exercise (e.g. identifying leaves) can readily be adapted to younger learners.

Learning Outcomes:

- Identification of trees from their leaves
- Analysis of community structure
    - Species richness (no. of species)
    - Abundance of each species (no. of individuals)
    - Size distribution of each species
- Plotting pie-charts, bar charts and histograms
- Calculation of simple descriptive statistics
- Interpretation of graphs and statistics

Equipment needed

- Flexible tape-measure
- Tree-leaf identification sheet
- Data collection sheet
- Blank A4 paper for sketch map
- Clip-board
- Pencil

Method

Select an area of woodland containing approx. 100 trees (of any species).
For each tree in your designated location:

- Use the tree-leaf identification chart to identify the species of tree
- Use the tape measure to measure the girth (circumference) of the tree trunk at a height of 1m above ground level
- Some trees have more than one trunk! If so, measure the largest trunk
- Enter the species and trunk measurement onto your data sheet

A blank data sheet and an example dataset are on the following pages

Analysing your data

1. Describing species richness

Species richness is the total number of species in an area.
- Simply add up the total number of different tree species on your data sheet.

2. Describing abundance

Abundance is the total number of individual trees of each species
- Add up the total number of trees of each species
- Plot a bar chart showing the number of trees of each species
- Plot a pie chart showing the number of trees of each species

Figure 1:
Pie chart showing abundance of different tree species
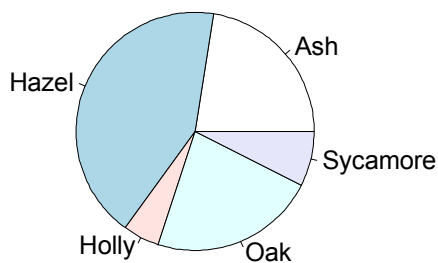
Figure 2:
Bar chart showing abundance of different tree species
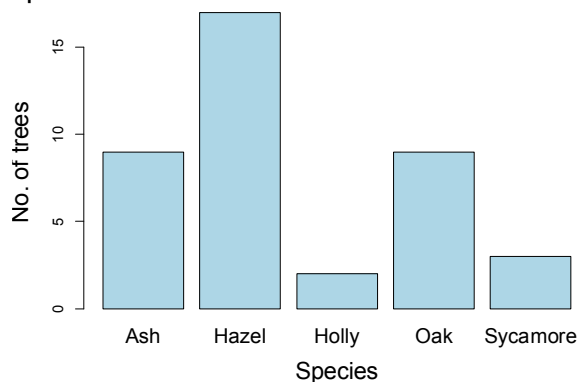
3. Describing woodland structure

For each species of tree:
- Calculate the average (mean) trunk girth
- Calculate the smallest (minimum) and largest (maximum) trunk girth measurements
- Calculate the difference between the minimum and maximum trunk girth measurements (the range)

Tree Species	Number of trees	Mean	Minimum	Maximum	Range
Ash	9	34.3	25	48	23
Hazel	17	21.8	10	32	22
Sycamore	3	57.7	46	72	31
Holly	2	27.0	25	29	4
Oak	9	83.2	25	128	103

- Make a box-plot showing the number of trees in different trunk girth size categories
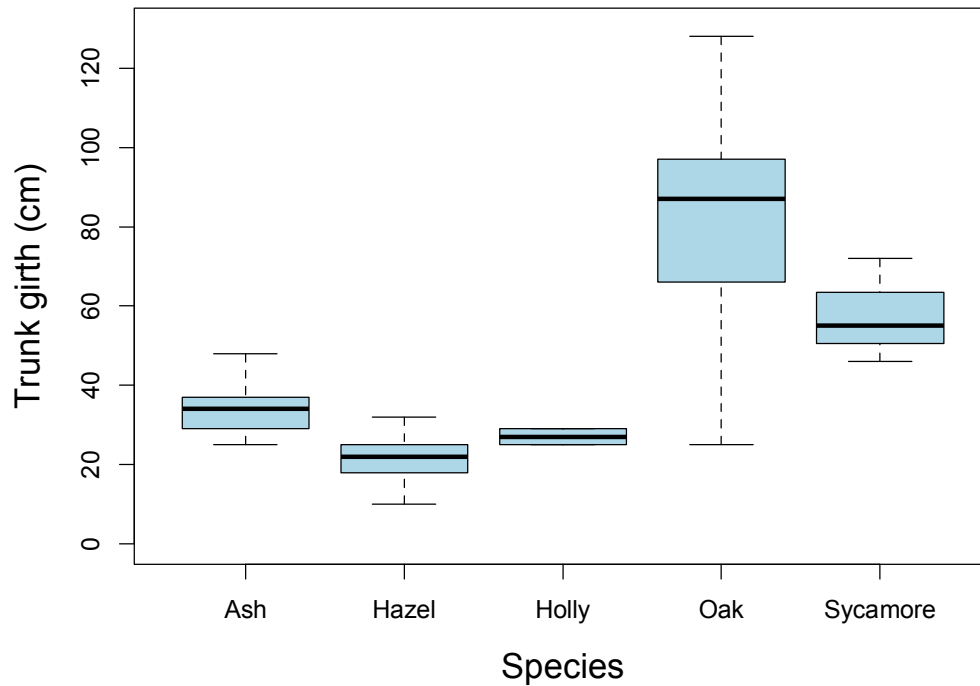
Points for discussion

- Why are some species of trees common and some trees rare?

- Are there any other tree species in the wood? If so, how large an area would you have to investigate to find all of the tree species present?

- Why are some species of trees bigger than others?

- Why are bigger trees less common than smaller trees?

- How old do you think these trees are? (You could try counting tree rings on any sawn logs you might find).

Data collection sheet

Group members:
Location:
Date:
Page number:

Tree number	Tree species	Trunk girth (cm)
1		
2		
3		
4		
5		
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Data collection sheet

Group members: Rob & Owen
Location: Frog Pond Wood
Date: 5th May 2013
Page number: 1

Tree number	Tree species	Trunk girth (cm)
1	Oak	48
2	Hazel	10
3	Hazel	13
4	Ash	25
5	Oak	66
6	Hazel	19
7	Hazel	22
8	Sycamore	46
9	Hazel	32
10	Ash	28
11	Holly	25
12	Hazel	20
13	Hazel	18
14	Hazel	27
15	Oak	87
16	Oak	25
17	Ash	36
18	Hazel	15
19	Oak	128
20	Sycamore	55
21	Sycamore	72
22	Ash	48
23	Oak	97
24	Hazel	24
25	Hazel	15
26	Hazel	32
27	Hazel	24
28	Oak	128
29	Ash	41
30	Ash	34
31	Holly	29
32	Oak	87
33	Hazel	22
34	Ash	31
35	Ash	29
36	Ash	37
37	Oak	83
38	Hazel	25
39	Hazel	22
40	Hazel	31