

### Activity 3: Comparing the percentage cover of a plant species in grasslands under different management strategies

AQA GCE Biology : Unit 4; BIOL4; 3.4.1 The dynamic equilibrium of a population is affected by a number of factors

APPROX. TIME 1.5 Hours

Lesson	Spec. Ref	Objectives	Teaching activities	Resources
3	3.4.1	<p>1. Describe how to carry out random sampling with quadrats</p> <p>2. Collect valid data on plant abundance</p> <p>3. Calculate the standard error of the mean and use this to assess the strength of a conclusion</p>	<p><b>Intro:</b> Discuss why you would want to compare plant abundance at 2 sites (link to ecology jobs /conservation – management strategies to conserve endangered species/choosing building sites)</p> <p>Students get into groups of 2/3 and choose which species to compare (here you will need a pre-visit to find out what's out and easily identifiable, depending on season!) (e.g. daisy, dandelion, grass, plantain, speedwell)</p> <p>Show objectives and describe 2 management strategies for the meadowland to be used</p> <p><b>Starter:</b> <b>In classroom use powerpoint to guide discussion:</b> Use powerpoint and students' past experiences to decide a method to collect valid data</p> <ul style="list-style-type: none"> <li>i) Null hypothesis</li> <li>ii) Random siting (use tape measure to create large grid and use random no. table to decide coordinates vs spin pencil and random no. of steps)</li> <li>iii) Number of quadrats (~10 , discuss need to do more if variable results or less if very similar, can be determined by running means)</li> <li>iv) Which measure of abundance to use – pros and cons (<b>use % cover or density if individuals can be</b></li> </ul>	<p>Quadrats (1 per 3)</p> <p>FSC playing field or other meadowland plant identification guide</p> <p>Random number tables</p> <p>2 Long tape measures 10m</p> <p>Calculators</p> <p>Students need pencil and paper to record data</p> <p>Clipboards</p> <p>Graph paper and rulers</p>

			<p><b>identified, to get experience)</b></p> <p><b>Go outside for practical:</b></p> <ul style="list-style-type: none"> <li>v) Set up large grid to allow random siting of quadrats</li> <li>vi) Each group collect data from 2 sites on the abundance of a different species – aim for 10 quadrats per site</li> </ul> <p><b>In classroom do analysis:</b></p> <ul style="list-style-type: none"> <li>vii) Calculate means and plot on bar chart – discuss what the preliminary conclusions are, but are they due to chance?</li> <li>viii) Go through powerpoint about calculating standard error of the mean (may be quickest to use internet prog. to work out SD and SE)</li> <li>ix) Students apply to their results, plot error bars and then write out 95% confidence intervals</li> </ul> <p><b>Plenary:</b> Students present their data</p>	
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