# M1.5 – Understand the principles of sampling as applied to scientific data

## Teacher answers

### Quiz

1. I want to measure the change in distribution of green alga from the low tide mark to the high tide mark. Should I use a random or non-random sampling method for choosing where to place my quadrats?

Non-random

1. You want to measure the distribution of flowers in a woodland. The woodland has been divided up into 100 areas of 10 m2. You cannot measure them all and so have to choose 10 sampling points. Should you use random or non-random sampling?

Random

3. If in the previous example 19 of the areas were identified as heavily waterlogged how might stratified sampling be employed to improve our sampling technique?

Water-logged areas should be sampled in a proportionate manner i.e. 1.9 out of 10 – this is obviously not a whole number – so a sensible compromise would be 2 out of the 10 samples. Within these layers – samples should be chosen at random.

1. A rock pool was sampled for species richness.
Calculate Simpsons Index of Diversity for this habitat using the formula:

$$D= 1-∑(\frac{n}{N})^{2}$$

|  |  |  |
| --- | --- | --- |
| **Species** | **Numbers****(n)** | **squares** |
| Common periwinkle | 35 | 1225 |
| Dog whelk | 41 | 1681 |
| Common limpet | 8 | 64 |
| Sea urchin | 4 | 16 |
| Top shells | 24 | 576 |
| Total (N) | 112 |  |

D = 1 – (Sum of n2 / N2)

Sum of n2 = 1225 + 1681 + 64 + 16 + 576 = 3562

N2 = 12544

Sum of n2 / N2 = 3562 / 12544 = 0.284

D = 1 – (Sum of n2 / N2) = 1 – 0.284 = 0.716 = 0.72 (to 2 significant figures)

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