

## Notes for teachers

### Getting started

Go to the main website and download the following pdfs and photocopy them as needed:

- 'How to Hunt' which has instructions on how to identify banded snails
- The Record Sheet
- A more detailed identification guide called 'Want to know more'

Then:

- Decide on a short username for your class
- Register using this name by following the instructions on the site.
- Familiarize yourself with the site.

During data input you are asked to give the Hunt (i.e. a set of data collected at a particular place and time) a name. You can produce as many hunts as you like, so each student, or each group of students in the class can have their own. When you download the data, sort it by username and all the class results will be grouped together.

### What can you do?

The Hunt can be used in many different ways. The choice is yours and will depend on the age of students, among other things. Here are some suggestions.

#### Demonstrate biological variation

Variation is the raw material on which natural selection acts. The most fundamental thing anyone hunting for *Cepaea* can discover is just how much variation there actually is. This point alone would be a valuable take-home message for younger students. For older ones you might introduce the idea of the inheritance of variation.

#### Discuss the genetics

Three Mendelian loci control the characters that we are interested in:

Shell colour is determined at one locus:

Brown ( $C^b$ ) is dominant to Pink ( $C^p$ ) which is dominant to Yellow ( $C^y$ )

Banding is controlled by two loci:

One locus controls band presence/ absence:

Absence (U) is dominant to presence (u)

The above 2 loci (colour and band presence/absence) are linked (i.e. occur on the same chromosome).

Another locus controls the suppression of bands 1, 2, 4 & 5, producing a single band in the mid position (M). One band is dominant to 5 bands (m).

Using the information given, and knowing that *Cepaea* is diploid; you can get students to write down the possible genetic make-up (genotypes) of their samples. Because of dominance, the

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2 genotype frequencies cannot be calculated directly. For example, a snail with a UU genotype will have the same 1-banded phenotype as one that is Uu.

The codes we have used for the different alleles mentioned above are simplified ones and are different from those given in the document on genetics, which are those used in research.

#### Investigate adaptation

The variation in shell patterns in *Cepaea* was once regarded as of no adaptive significance to the animals, but we now know that shell colour and banding influence the visibility of snails to thrushes that prey upon them and also the body temperature of the snail.

Discuss how you would expect these two forces of natural selection to influence the distribution of different morphs.

Ask students to formulate hypotheses that might be tested with data collected in the Hunt.

How might the frequency of morphs change over time if thrushes decline in numbers or the climate warms up?

What effect would other birds or hedgehogs that also prey upon *Cepaea* have upon your expectations?

Data on changing song thrush numbers can be found on the BTO website at:  
<http://www.bto.org>

#### Investigate the ecology of *Cepaea*

What kinds of habitats does *Cepaea* like? Why? What do they eat? What other species are found in the same habitats and what are the possible relationships among them? (e.g. competition, predation).

#### Download and analyse data

From the download page on the main website you can download selected data.

The download file is in CSV (Comma Separated Value) format which can be opened with any spreadsheet program.

Students can use a spreadsheet to sort that data by any of the fields. Which fields you choose will depend upon what questions you are trying to answer. The fields are:

Username	Common Name	Yellow Unbanded
Record Name	Binomial Name	Yellow 1 Band
Comment	Total	Yellow 5 Bands
Habitat	Pink Unbanded	Brown Unbanded
Latitude	Pink 1 Band	Brown 1 Band
Longitude	Pink 5 Bands	Brown 5 Bands
Date of Hunt		

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