

TEACHER NOTES

Investigating Nature's Calendar: Key Stage 3 S1 – S3 in Scotland

Objectives:

The objectives of this activity are:

- to introduce the idea that natural events are linked to climate
- to introduce Phenology as a scientific term
- to introduce the UK Phenology Network as one of the organisations that looks at these data to identify patterns
- to show that there is a change in the flowering times of snowdrops
- to link that to a change in the onset of spring
- to try and relate this to global climate change

Curriculum:

Curriculum/guidelines mapping is shown below by country. In all cases the activity is aimed at the investigation aspects of science, but it does crossover into some content relating to climate change and the factors that influence plant behaviour.

England

Scientific Enquiry: Considering Evidence and Evaluating strands [SCI] (2j-2m, 2o and 2p)

Northern Ireland

Experimental and Investigative Science: Presenting and Interpreting Results (b – f)

Scotland

Skills in Science – Investigating. Reviewing and reporting on tasks strand. (Levels B, C, D and E)

Wales

Scientific Enquiry: Investigative Skills (3). Analysing Information (15-17) and Evaluating Information (18, 20)

The Y axis on the graph (Days after 31st December) may need some stressing as students are unlikely to have come across something like this before. A possible extra activity that could be done as an introduction would be to give a few numbers and then ask students to work out what the date is.

“If the number is 26, what is the date?”

It may be helpful to students to have a diary or calendar to hand when answering question four. More able students may raise the question of leap years affecting dates after 28th February.

Solutions (Where appropriate)

- Q1.** In which year did the snowdrops flower the earliest? **1995**
- Q2.** In which year did the snowdrops flower the latest? **1960**
- Q3.** In which year did they flower 40 days after the 31st December **1985**
- Q4.** On what date did the snowdrops first flower in 1990? **31st January 1990**

(Actual value is 31 days, depending on class allow 30th Jan – 3rd Feb)



Q6. Try and describe the pattern that the graph is showing.

The key ideas here are a downward trend in the data. It is important that the students relate the graph to the actual change in the flowering of the snowdrops. "It goes down" does not really show any understanding of what the graph is showing. The students need to make some comment about the fact that the date of the first flowering of snowdrops has become earlier in the year.

Q7. Spring appears to be changing – seasonal events such as snowdrops flowering are getting earlier. The snowdrop data gives some evidence for this.

Q8. To identify UK-wide patterns, data sets for snowdrop flowering from different parts of the UK for the same period should be compared. Data for other natural events, such as those mentioned in the article should also be examined. Long-term data sets collected over several decades would provide more convincing evidence than those covering just a short time period.

Q9. The aim of this question is to draw links between natural events in the UK, the UK climate and changes in the global climate. Mention of global warming is good but, depending upon the class it may be worth stressing that this also creates 'colder' and 'wetter' effects at different times and in different places on the Earth.

Suggested Homework Tasks or further work:

Students can research on the Woodland Trust websites or from other sources any other data and natural events that are recorded and collected as well as any patterns that have emerged.

This activity opens up many issues relating to climate change and as such can lead into a research based task. The Woodland Trust family of websites contains a great deal of information about some of these issues.

www.woodland-trust.org.uk

The Nature Detectives site **www.naturedetectives.org.uk** encourages students to register and record data themselves that forms part of a national database. The Live Maps on this site show the data.

Investigating Nature's Calendar (KS3)

Data Set

Below is the dataset that is used in the activity. This could be used for students to draw their own graphs. Also included is a second set of data from a different phenologist in Norwich.

Although data is collected every year, to simplify the graph drawing process averages are calculated in five yearly blocks.

The second data set will allow comparison but also adds potential complications. The students need to understand what a negative number is and how to handle the lack of data for 1960 and 1965.

The trend lines are very similar with the lines running roughly parallel showing the Norwich snowdrops flowering earlier (lower line). This can be used to prompt a discussion about differences within the UK.

Year	Date of Flowering Days after 31st December (Newcastle data)	Date of Flowering Days after 31st December (Norwich data)
1960	56	
1965	53	
1970	37	22
1975	38	12
1980	47	21
1985	40	13
1990	31	-1
1995	19	10
2000	25	8