



Edina Trust Bulb Project Extension Report for Teachers and Project Leaders

The National Museum of Wales (NMW) produced a paper on the results of the bulbs planted in pots for all schools. This was distributed to the schools involved and can be accessed via the NMW website - <http://www.museumwales.ac.uk/en/blog/2012-05-16/Spring-Bulb-for-Schools-Results-2005-2012>

This paper is about the 14 schools which took part in the pilot year of the Edina Trust Bulb Project. Of these 14 schools, five provided flowering data on their daffodils planted in the ground, and of these five, four provided flowering data on their daffodils planted in the ground and their bulbs planted in pots. It is this comparison of flowering dates which we are most interested in.

Of the five schools which provided flowering data, two are in the Scottish Borders, two in Conwy and one in Oxfordshire. They comprise of four non-coastal schools and one coastal school. (We will call this group “our five special schools” in this paper). However, these schools provided data on a total of 72 bulbs!

Of those five schools, the four which provided data on their daffodils planted in the ground and their bulbs planted in pots comprise of four non-coastal schools. (We will call this group “our four very special schools” in this paper).

The main reason for the small sample of data with which to analyse is that as many as six of the 14 schools didn’t plant any daffodils in the ground at the beginning of the project (or didn’t send us their results).

Except where we have compared the difference in flowering dates of those daffodils planted in the ground with those in pots (*Chart 1.*), all other figures in this report concerns only those daffodils planted in the ground.

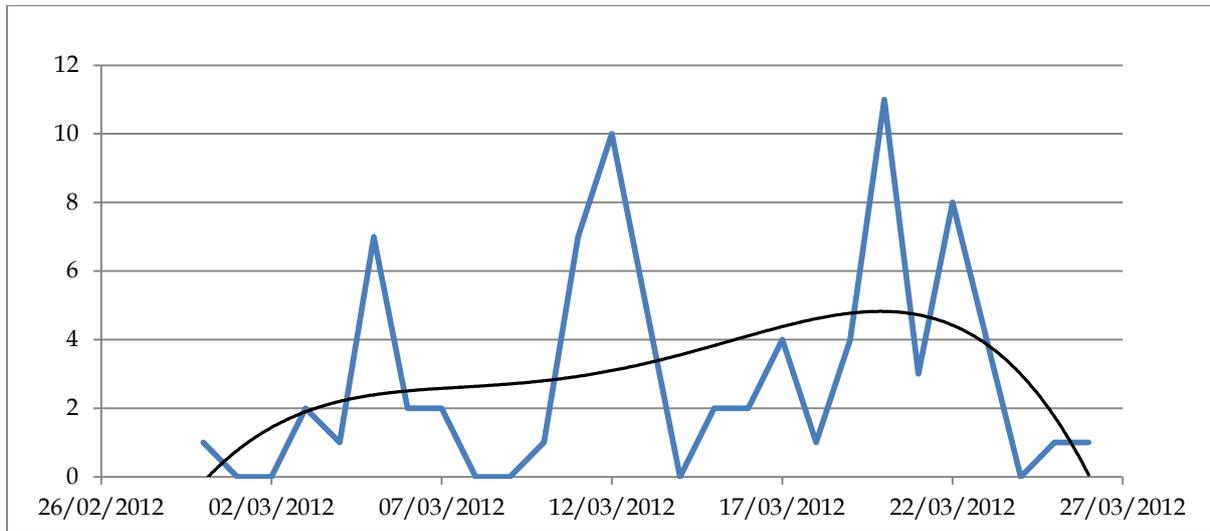
So this is a very small data set! However, we will use results from this year to put together hypotheses to test in the next year of the project.

I have looked at the impact of temperature and rainfall on the:

- i) difference between flowering dates, and
- ii) the heights of plants at the time of flowering

i) Difference between flowering dates

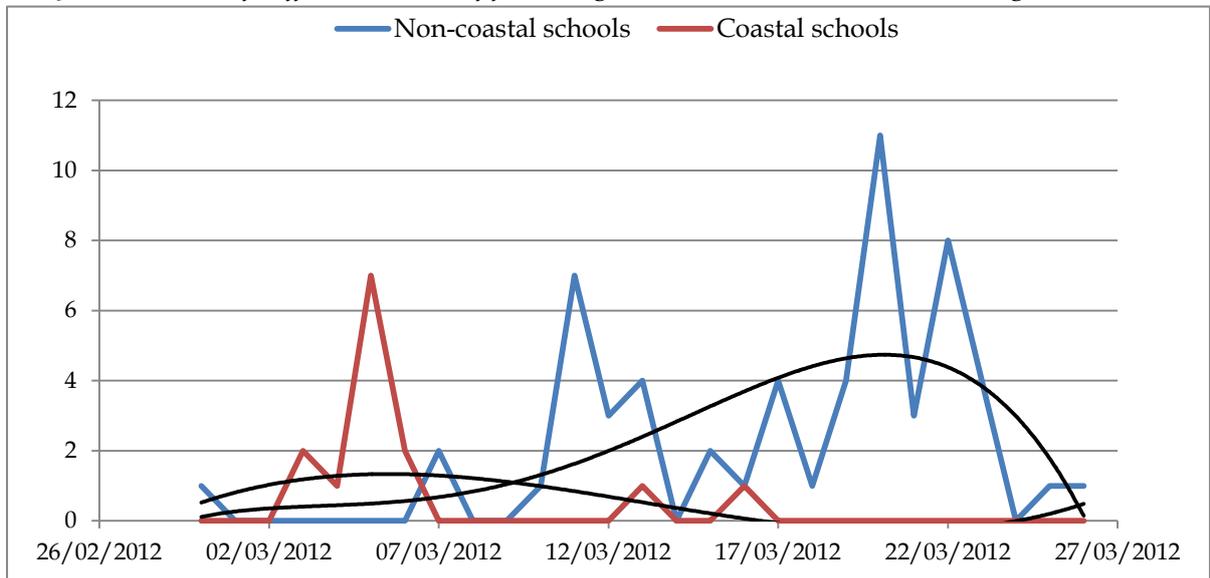
Graph 1. Number of daffodils vs. date of flowering – all schools (including trend-line)



Source information: Graph showing the frequency of daffodils (planted in the ground) flowering on a given date. Includes data from the five special schools, 72 daffodils in total.

This can be split into coastal and non-coastal schools:

Graph 2. Number of daffodils vs. date of flowering – coastal & non-coastal (including trend-lines)

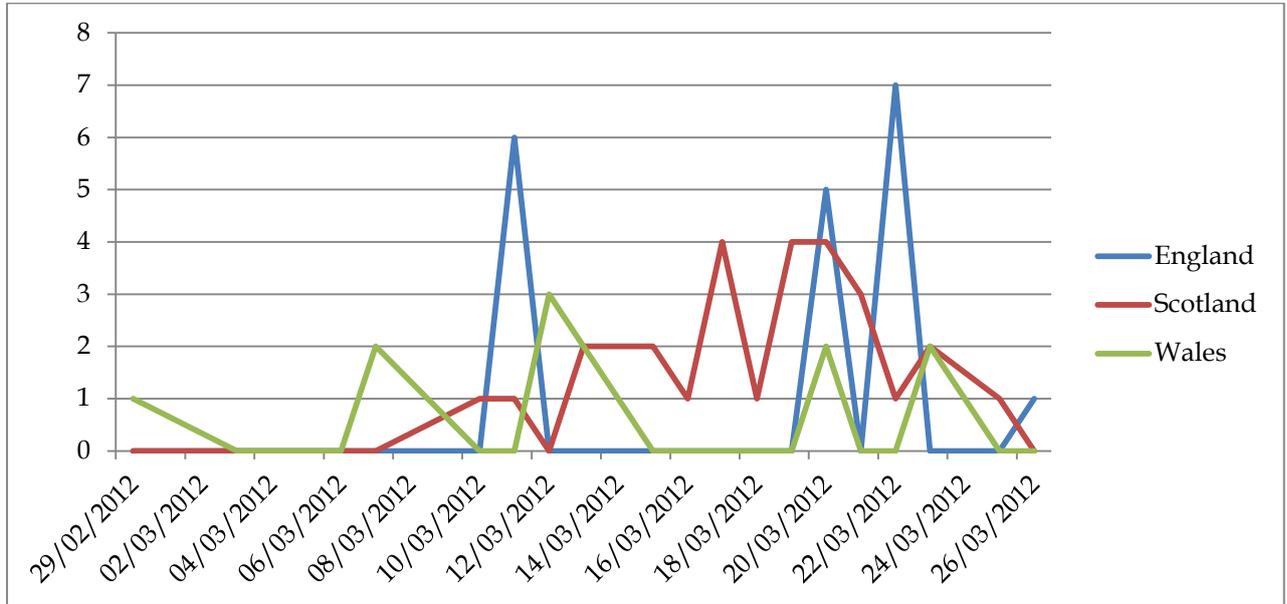


Source information: Graph showing the frequency of daffodils (planted in the ground) flowering on a given date. Split into non-coastal, four schools, and coastal, one school. 72 daffodils in total.

This shows that almost all of the daffodils that flowered before the 7th March were in coastal regions. Daffodil flowers in coastal schools opened, on average, **12 days** before those in non-coastal schools.

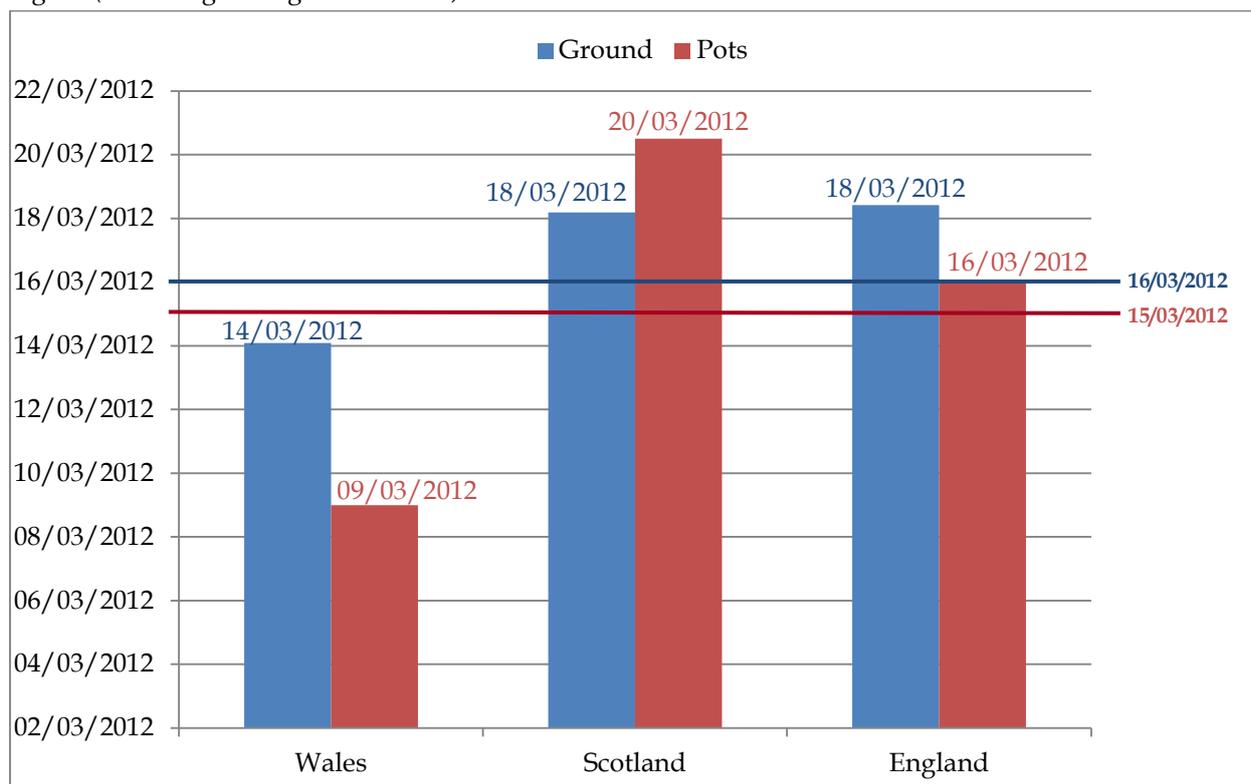
HYPOTHESIS 1: Daffodils in coastal schools will flower before those in non-coastal schools. This is because coastal areas do not experience such cold nights during the winter because the sea acts like a blanket warming up the coast. Coastal schools were defined as those less than two miles from the coast.

Graph 3. Number of daffodils vs. date of flowering – by region, non-coastal



Source information: Graph showing the frequency of daffodils (planted in the ground) flowering on a given date, organised by region. Includes data from the four non-coastal schools.

Chart 1. Average flowering dates of daffodils planted in the ground compared with those in pots - by region (including average trend-lines)



Source information: Chart showing the average flowering date of daffodils planted in the ground and in pots, organised by region. Includes data from our four very special schools. Horizontal lines are the overall average dates for daffodils in the ground and in pots – revealing an overall one day difference, against a background of a high level of variation.

The Welsh school’s daffodils flowered the earliest of our four very special schools, both in the ground and in pots. This could be due to the higher temperatures recorded in Wales than in England or Scotland during December and January. As shown in *Graph 4*.

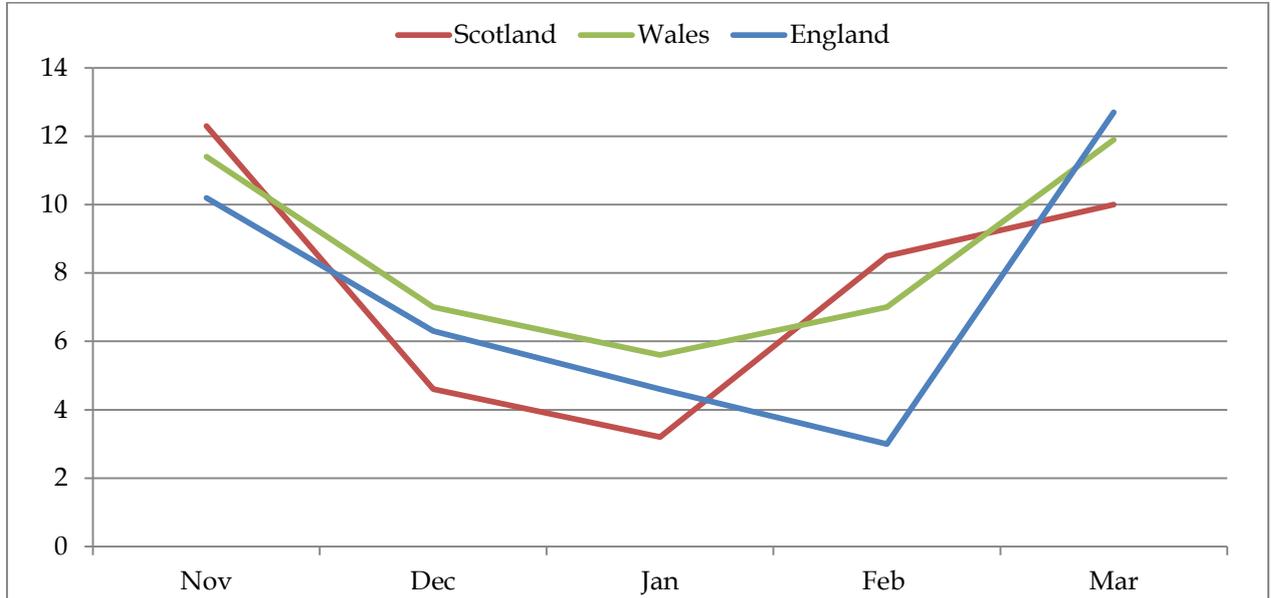
This also shows that those daffodils in pots were more sensitive to the temperature during these months. Where the temperatures were higher, the daffodils in pots flowered earlier, but where it was colder the daffodils in pots flowered later. Daffodils in the ground showed less variation in their flowering dates, perhaps because ground temperatures fluctuate less compared with air temperature and therefore the temperature of the bulbs also fluctuates less.

As shown by the average dates (horizontal lines) on *Chart 1.*, the daffodils planted in pots flowered on average one day before those planted in the ground.

HYPOTHESIS 2: Schools in regions that record higher temperatures during the months of December and January will have earlier flowering daffodils, both in pots and in the ground. The effect of the temperature fluctuation will be more pronounced with the daffodils in pots compared to those in the ground.

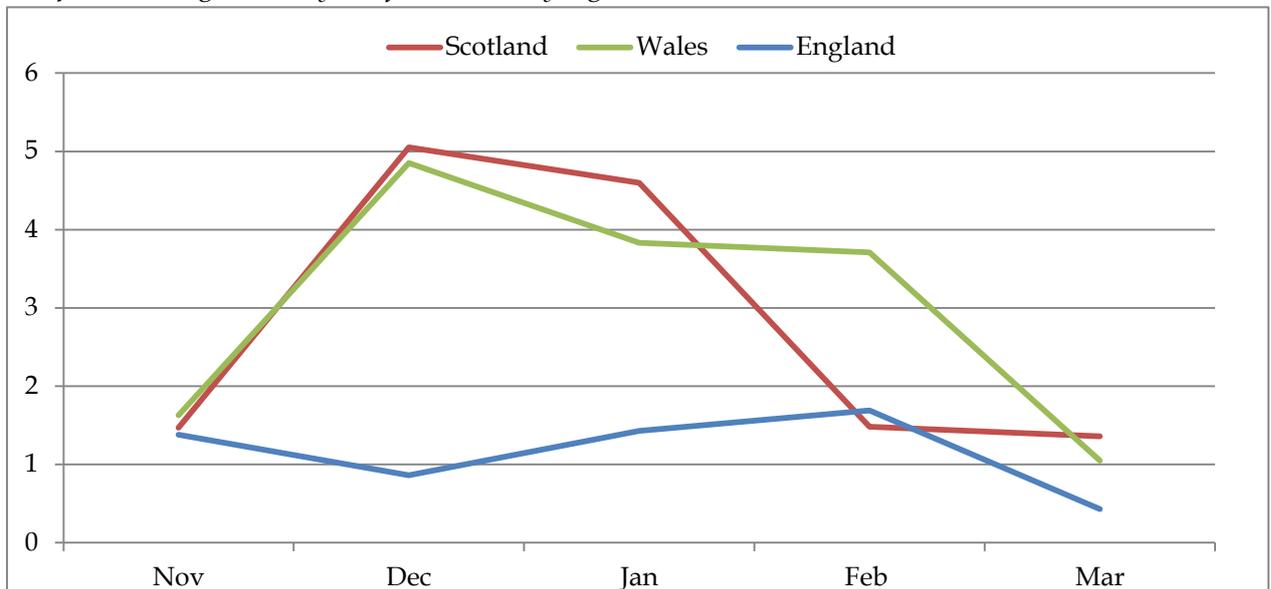
HYPOTHESIS 3: On average, daffodils in pots will flower before those planted in the ground.

Graph 4. Average monthly temperature (C°) – by region



Source information: Graph showing the average monthly temperature, organised by region. Includes data from our five special schools.

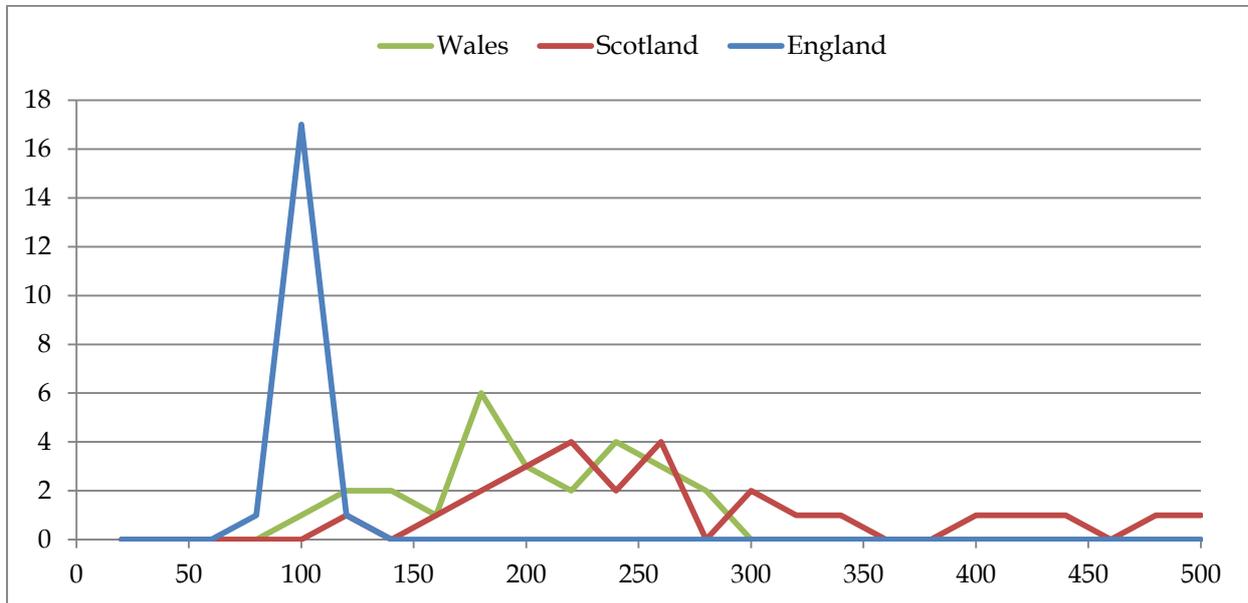
Graph 5. Average monthly rainfall (mm) – by region



Source information: Graph showing the average monthly rainfall, organised by region. Includes data from our five special schools.

i) Heights of plants at the time of flowering

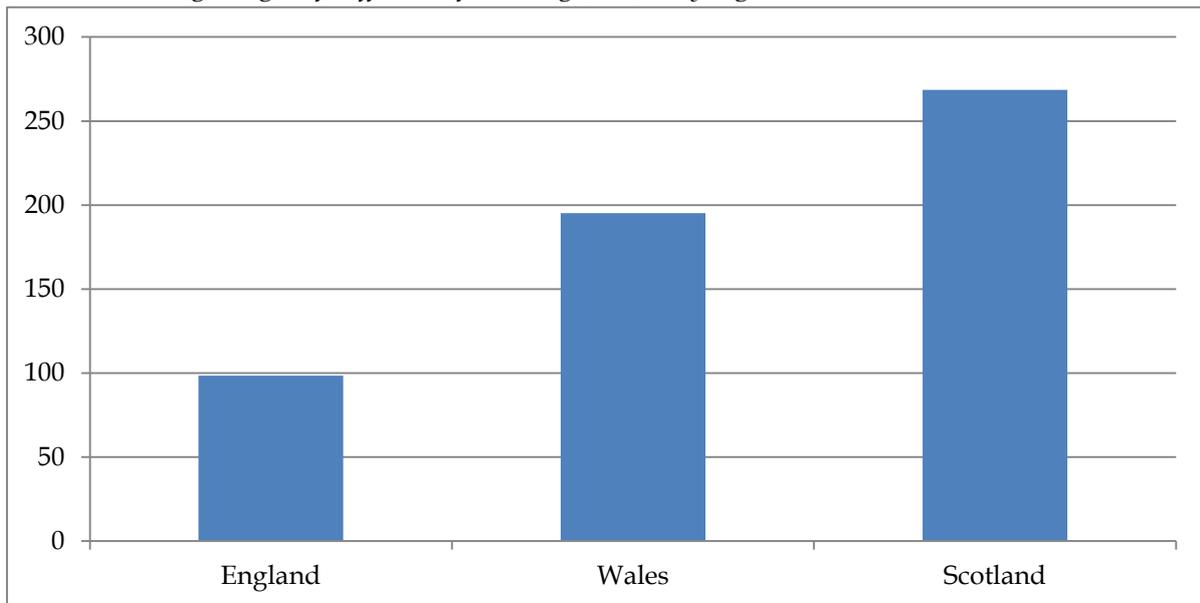
Graph 6. Number of daffodils vs. height of daffodil at flowering (mm) – by region



Source information: Graph showing the frequency of daffodils (planted in the ground) at a given flowering height, organised by region. Includes data from the five special schools. 72 daffodils in total.

It is clear to see from this graph that the data provided by the English school does not fit into the pattern of flowering heights recorded by other regions. For this reason I will instead use a chart of average heights to look at any patterns, see *Chart 1*.

Chart 2. Average height of daffodil at flowering (mm) – by region



Source information: Graph showing the average height of daffodils (planted in the ground), organised by region. Includes data from the five special schools. 72 daffodils in total.

The increased height of those plants in Wales, and particularly in Scotland, compared to those in England could be due to the higher temperatures in Scotland and Wales during February - the time that the daffodils would have been growing above ground. It could also have been affected by the higher rainfall in these areas. See *Graphs 4. & 5.*

HYPOTHESIS 4: Schools in regions with higher levels of rainfall will record taller daffodil flowering heights.

HYPOTHESIS 5: Schools in regions with higher temperatures during February will record taller daffodil flowering heights.

Summary

Well done to our five special schools. Your data has given us good ideas for next year when we will repeat the Extension project with more schools.

Now that I have looked at the effects the weather has on our bulbs, I know that I will be a lot more aware of the weather this coming Winter and Spring and the implications it will have for our results next year, and I'm sure you and your pupils will be too!

We hope that all of our 14 schools will be encouraged to participate again next year.

Rose Blake

1st June 2012