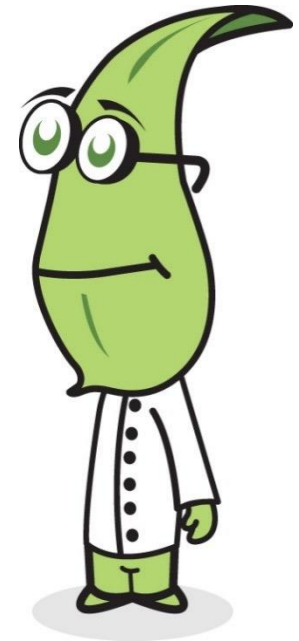


# UK Spring Bulbs for Schools Report 2012-2023



**AMGUEDDFA  
CYMRU**

Edina  
Trust  
Bulb Project



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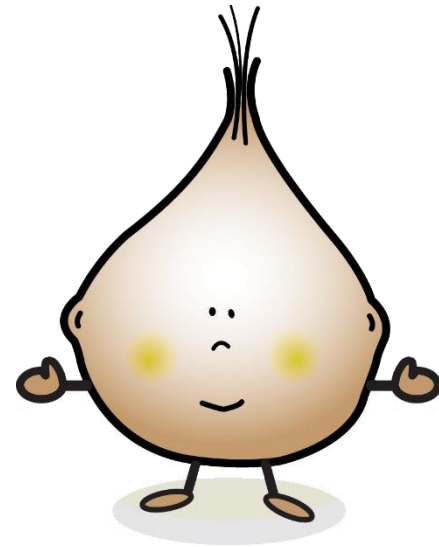
## UK Weather data 2012-2023

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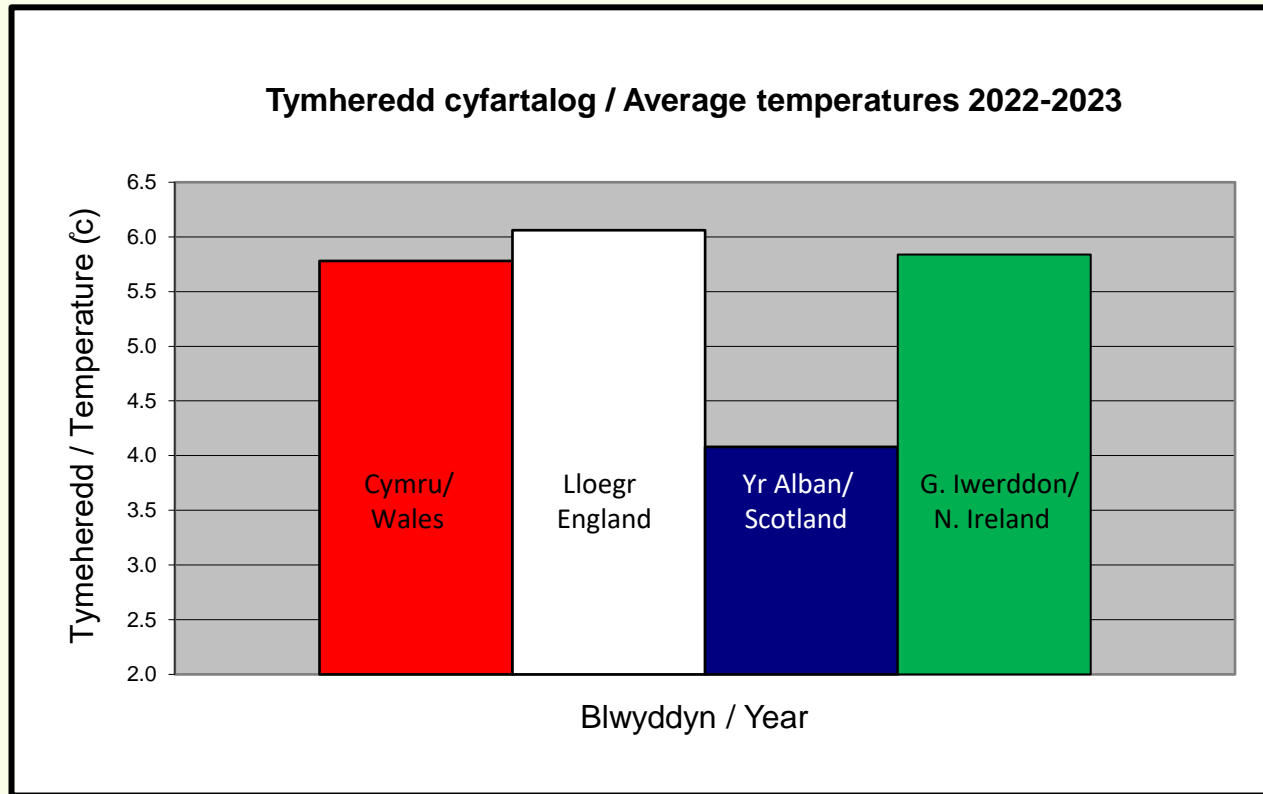


# Summary 2012-2023

- The following summary looks at key patterns and trends evident in the data recorded by schools over the last 11 years.
- Weather readings are taken between November and March, meaning that records for each year include readings from the November and December of the previous year. For example, when the report talks about results for 2012 it's referring to data taken from November 2011 to March 2012.
- You can download the data to study yourself at:  
<https://museum.wales/spring-bulbs/>

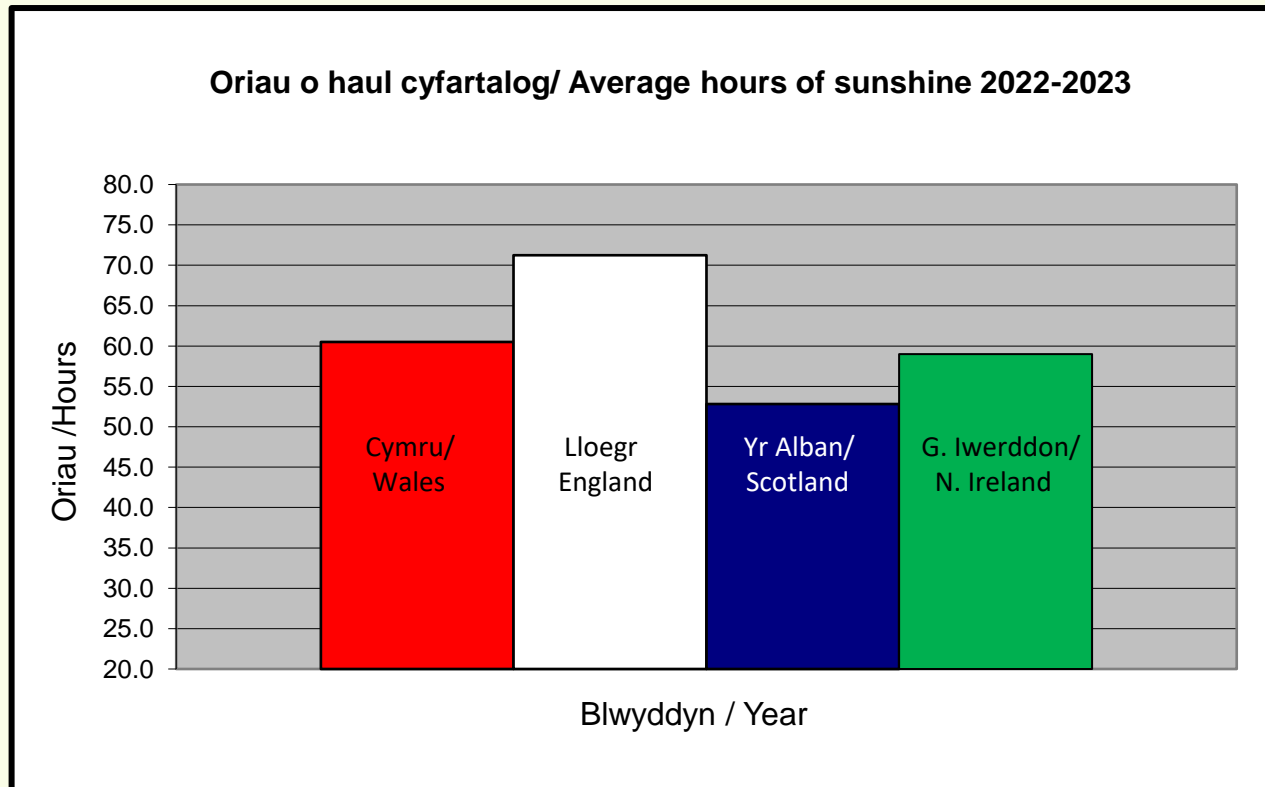


# Which country was the warmest / coldest?



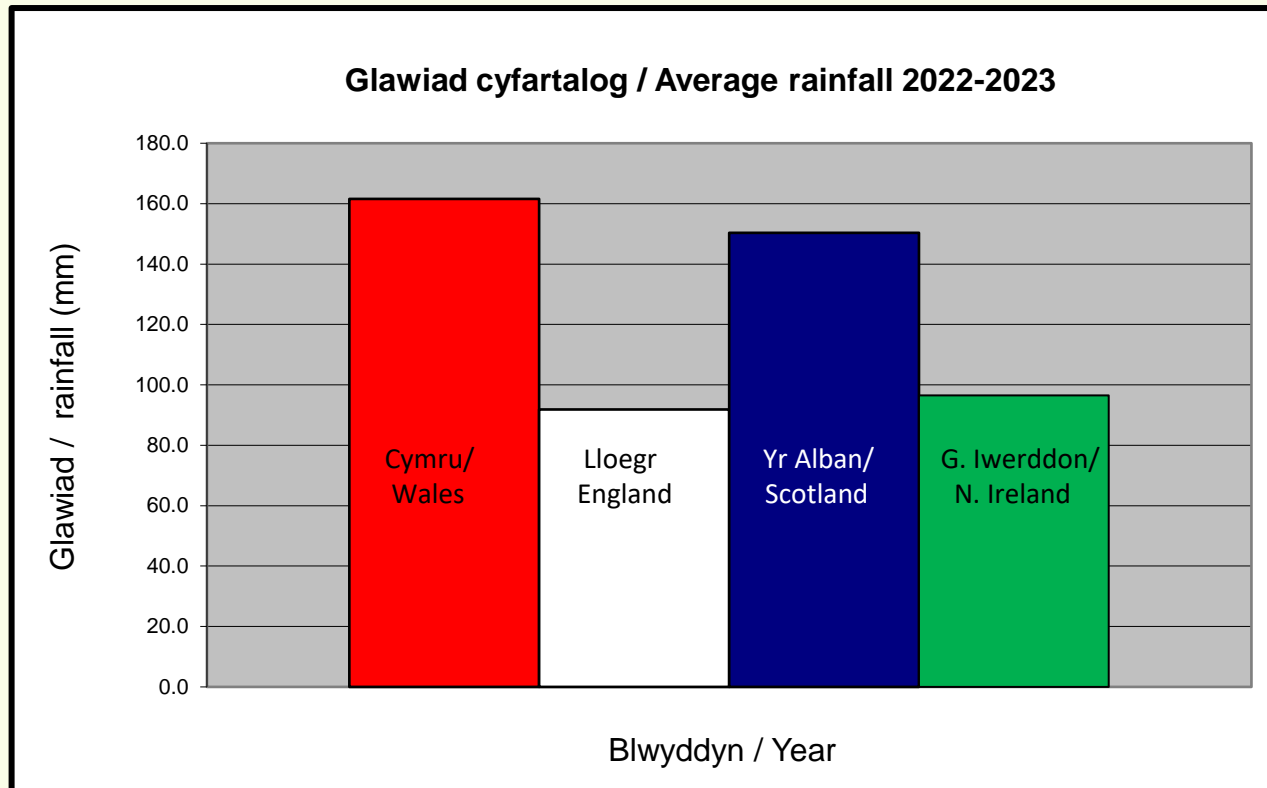
The bar chart shows the average overall temperatures for Wales, England, Scotland and Northern Ireland from November 2022 to March 2023. We can see that England had the highest average overall temperature at 6.1°C. Scotland was by far the coldest, with an average temperature of 4.1°C.

# Which country had the most / least sunshine?



The bar chart shows the average hours of sunshine for Wales, England, Scotland and Northern Ireland from November 2022 to March 2023. England had the most hours of sunshine for this period, with an average of 71.3 hours. Scotland had the least hours of sunshine with an average of 52.8 hours.

# Which country had the most / least rain?



The bar chart shows the average rainfall for Wales, England, Scotland and Northern Ireland from November 2022 to March 2023. We can see from this graph that Wales was the wettest country for this period, with an average rainfall of 161.6mm and England was the driest with an average rainfall of 91.9mm.

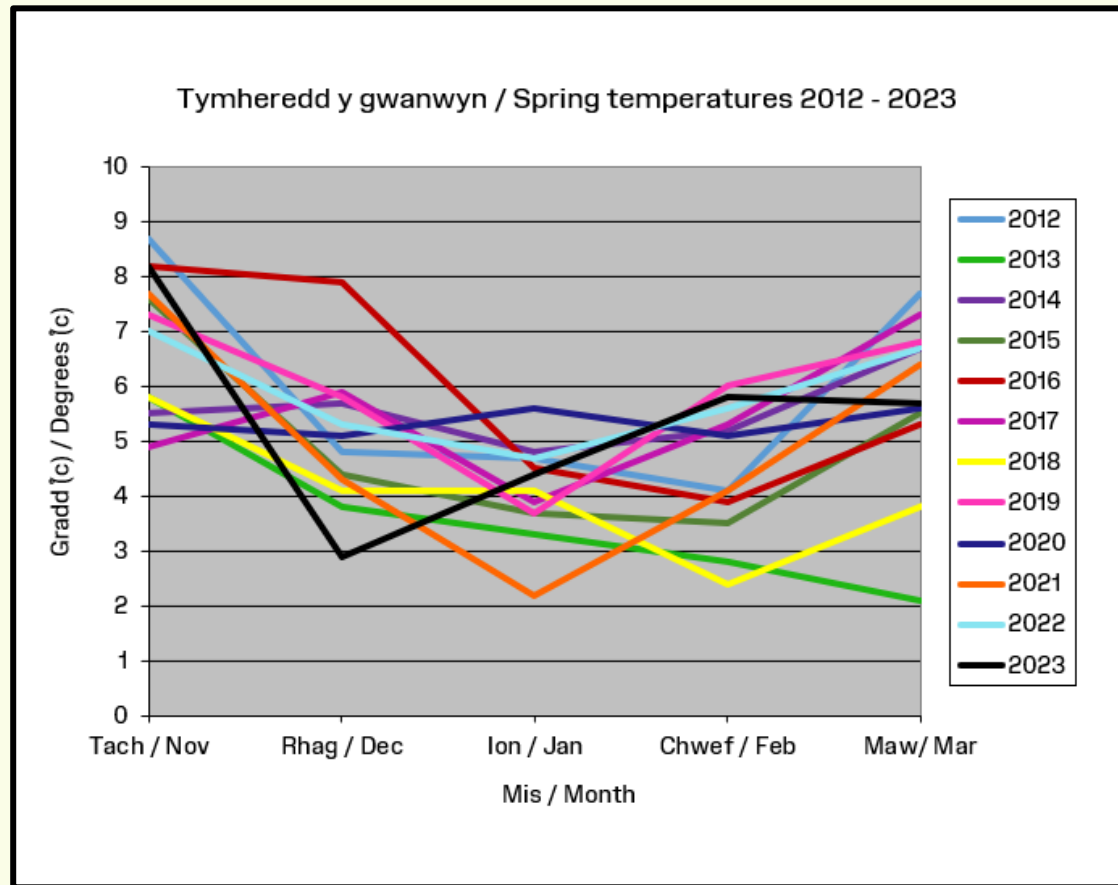
We've looked closely at the averages for temperature, hours of sunshine and rainfall and have compared results from Wales, England, Scotland and Northern Ireland.

Now, let's see how this year's findings compare to those of previous years! Do you think the weather has been warmer or colder than last year? Have we had more hours of sunshine or less? Has it been wetter or drier?

Let's find out...



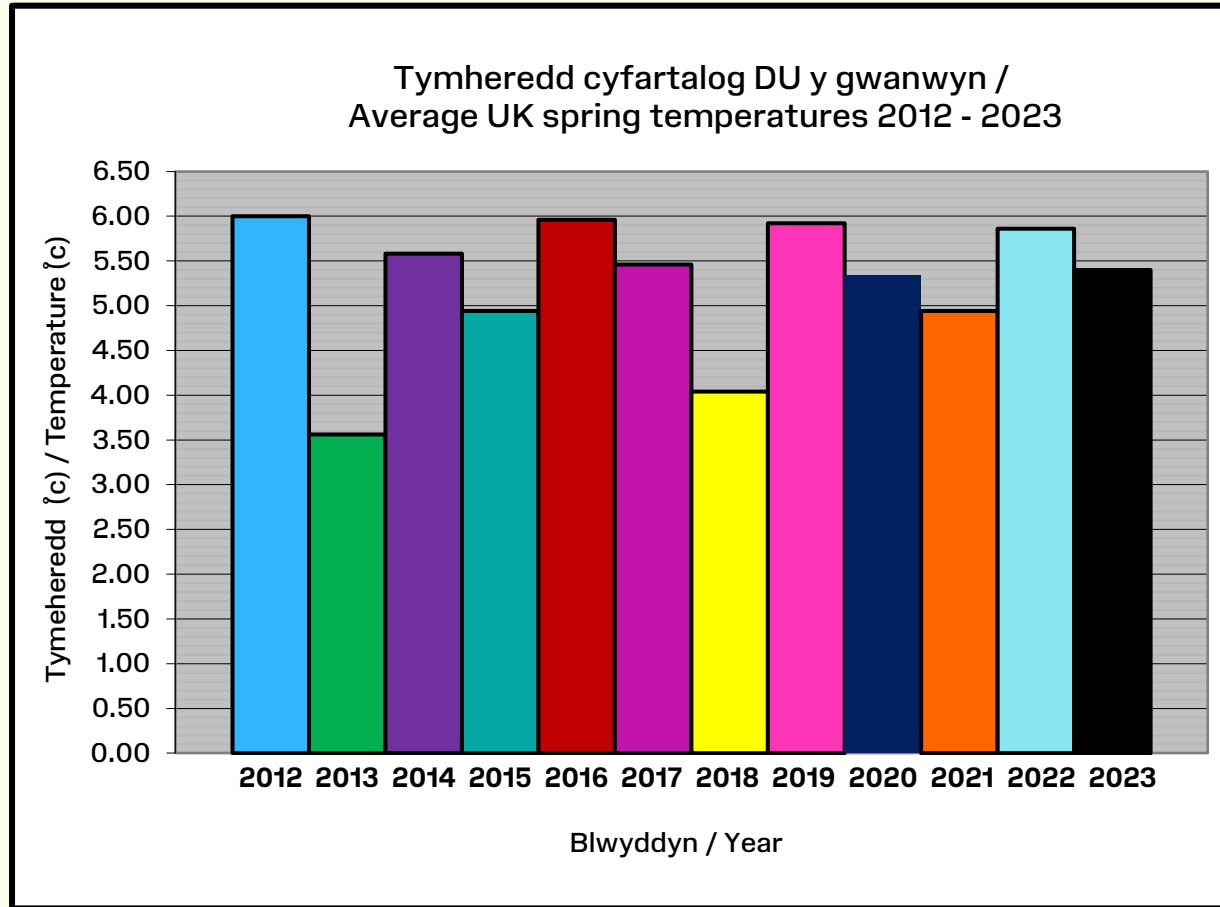
The line chart shows average monthly temperatures for the period November-March for the years 2012-2023.



We can see from the chart that 2022-23 saw the coldest December and the second warmest November and February of our investigation. December was the only colder than average month in 2022! The MET Office has stated that February 2023 was the joint fifth mildest February on record (in a series dating back to 1884).

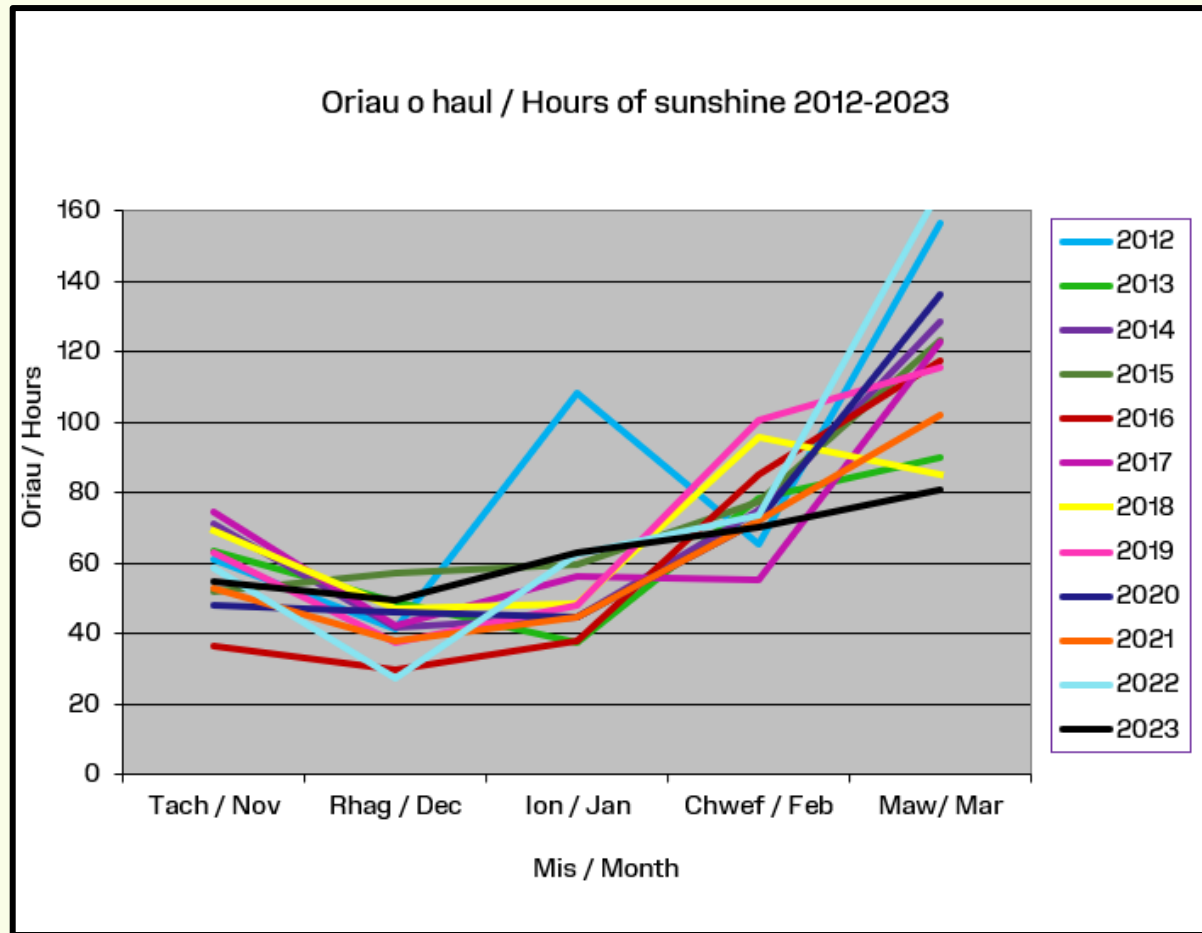


The bar chart shows the average temperatures for the period November-March for the years 2012 to 2023.



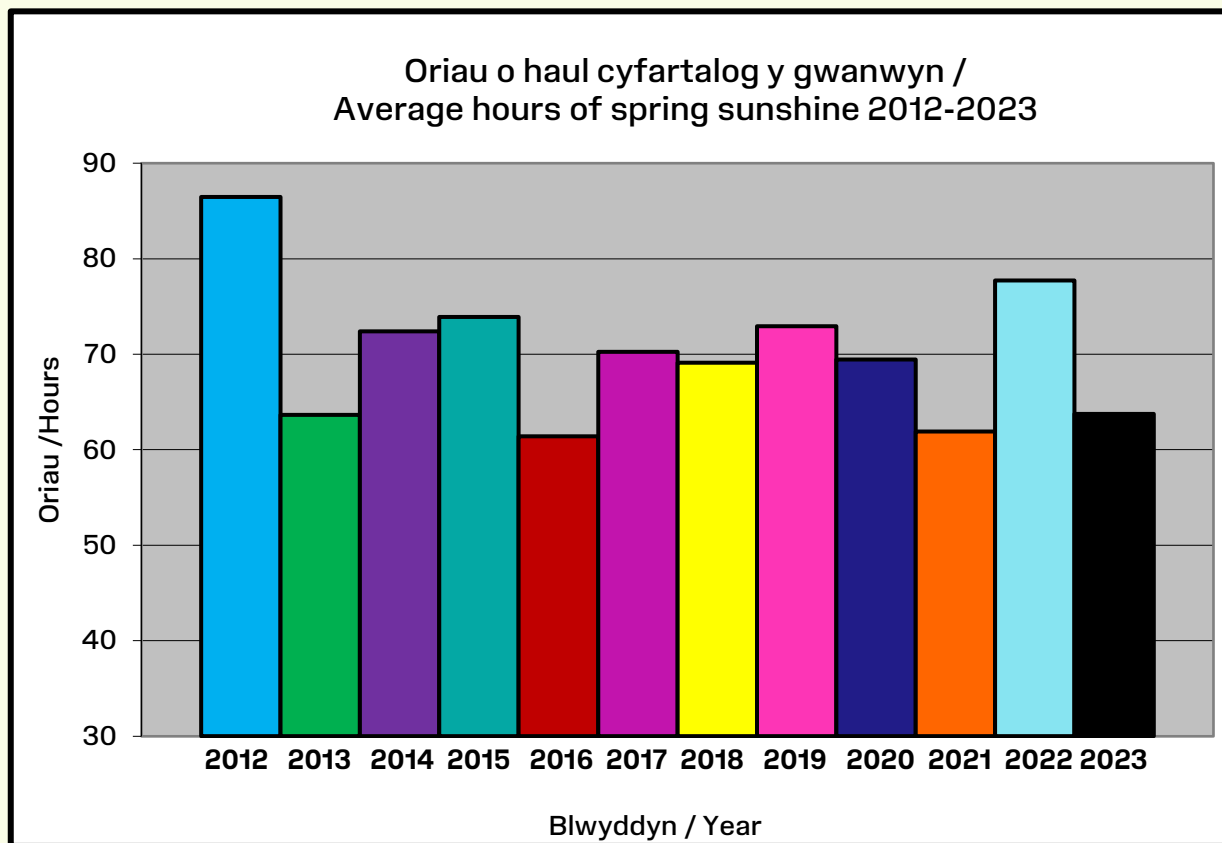
The average temperature for this period was 5.2°C. We can see from the chart that 2023 saw close to average temperatures for our period at 5.4°C. There are 2.44°C between the warmest (2012) and coldest (2013) years.

The line chart shows average hours of sunshine for the period November-March for the years 2012-2023.



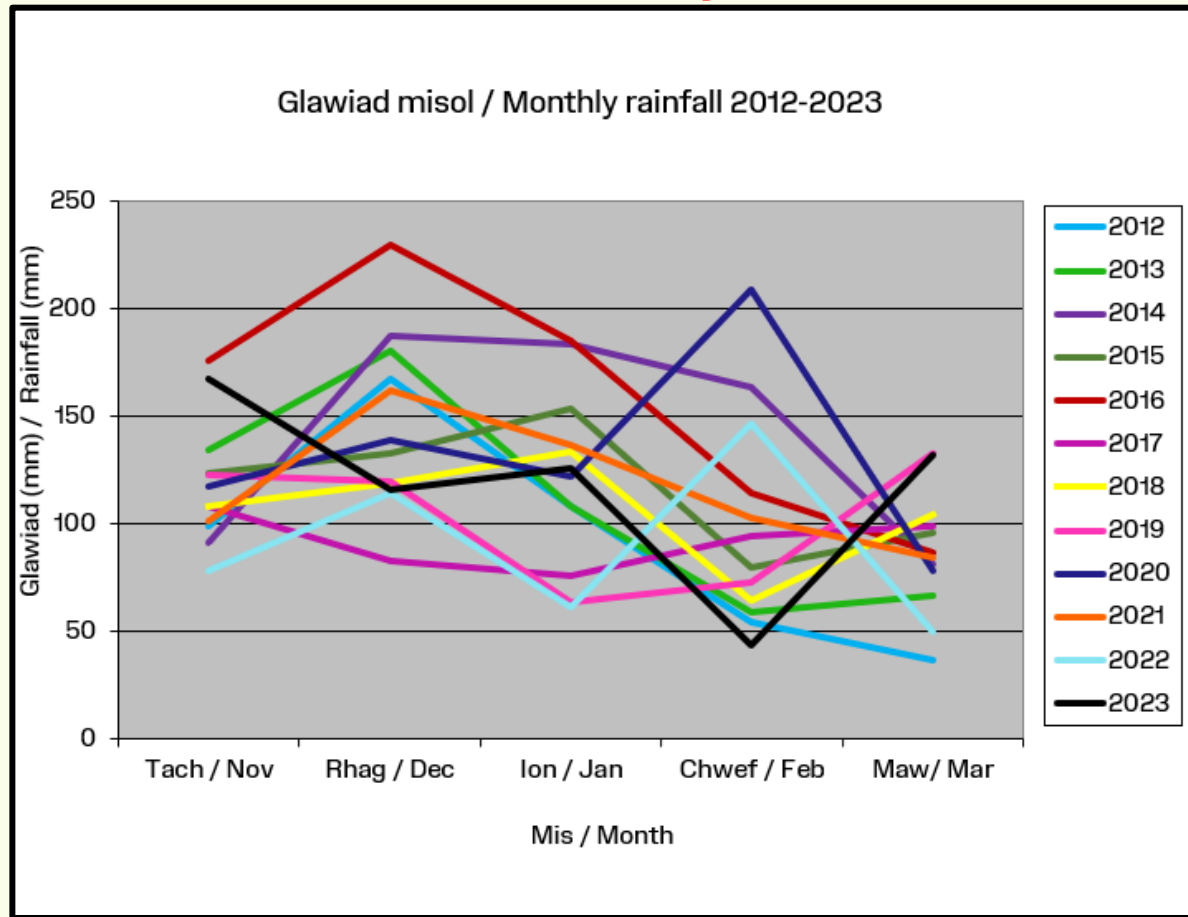
The chart shows that 2023 saw lower than average hours of sunshine in November, February and March and the second highest hours of sunshine of our period in December and January. The MET office have stated that January 2023 was the third sunniest on record (in a series dating back to 1919). I wonder what that will mean for our bulbs!

The bar chart shows average hours of sunshine for the period November-March for the years 2012-2023.



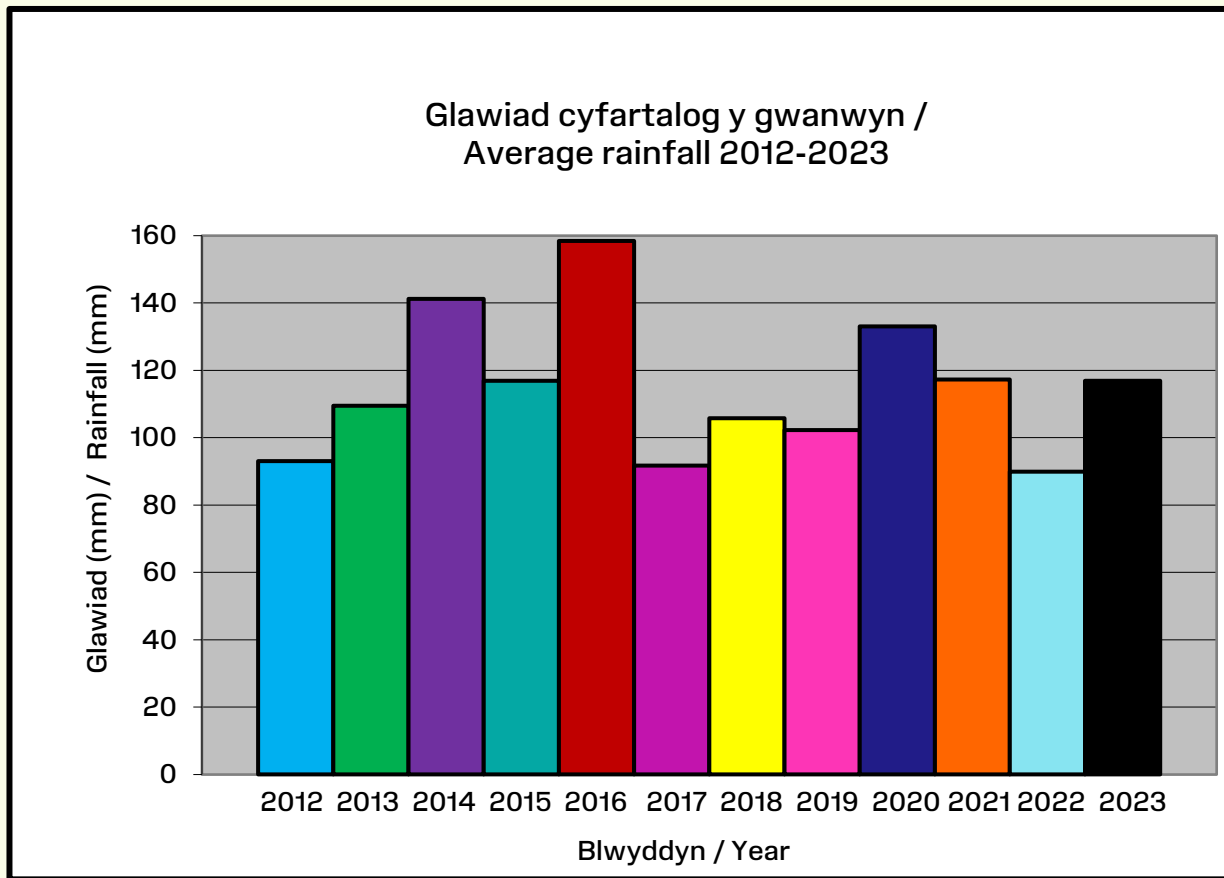
2023 saw the third lowest hours of sunshine for our period. 2022 saw the second highest hours of sunshine for our period. I wonder if our bulbs will flower earlier or later than last year? There are 25 hours difference between the year that saw the highest average hours of sunshine (2012) and the year that saw the lowest (2016).

The line chart shows the average rainfall for the period November-March in the years 2012-2023.



We can see from the chart that 2023 saw the lowest average rainfall of our investigation for February and the second highest for November and March. The MET Office has stated that 2023 saw the driest February since 1993! In contrast, 2020, 2017 and 2022 were three of the wettest February's on record.

The bar chart shows average rainfall for the period November-March for the years 2012 to 2023.



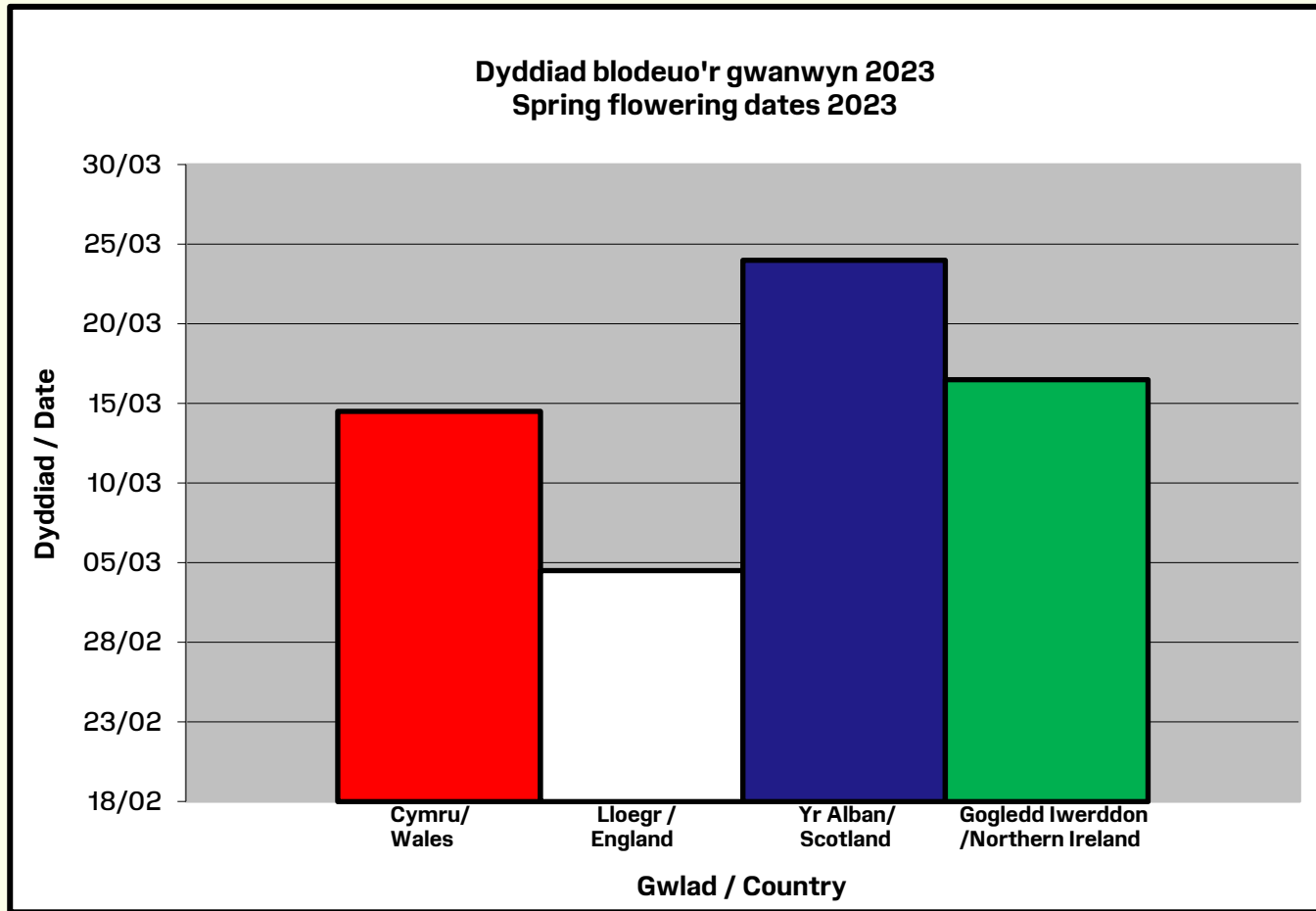
The bar chart shows that 2023 saw the joint fourth highest average rainfall of our investigation. 2016 was the wettest year of the project, with an average rainfall of 158mm. But remember, the last graph showed that there was lower than average rainfall in February which is an important time for our bulbs.

Plants need air,  
light, warmth,  
water and  
nutrients to  
grow.



England was the warmest country with the most hours of sunshine but the least rain. Scotland was the coldest country with the lowest hours of sunshine and Wales saw the highest rainfall. What does this mean for our results?

## Which country saw plants flower earliest?



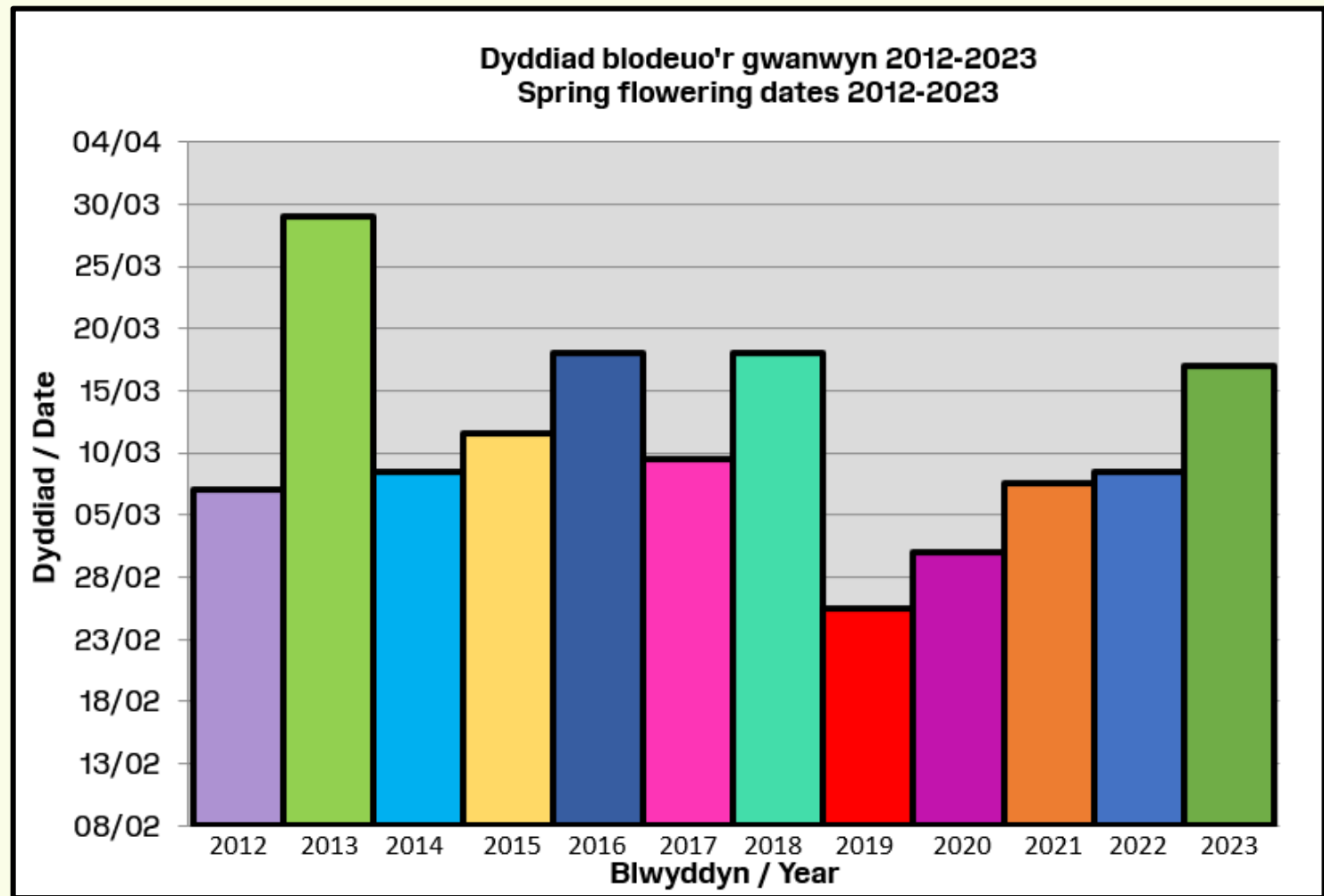
Our results show that plants flowered earliest in England and latest in Scotland. Scotland was the coldest country and saw the least sun. England had the highest temperatures and hours of sunshine and far less rain. Looking at the monthly averages for rainfall and hours of sunshine will help us to understand these results.



## Results table for the UK 2012-2023

Blwyddyn / Year	Dyddiad blodeuo'r crocws / Crocus flowering date	Dyddiad blodeuo'r cennin Pedr / Daffodil flowering date	Tymheredd / Temp (°C)	Glawiad cyfartalog / Average rainfall (mm)	Oriau o haul / Hours of sunshine
2023	11/03/2023	23/03/2023	5.4	117	63.8
2022	05/03/2022	12/03/2022	5.86	90	77.72
2021	07/03/2021	08/03/2021	4.9	117	61.9
2020	03/03/2020	01/03/2020	5.34	133	69.44
2019	22/02/2019	01/03/2019	5.92	102	72.94
2018	11/03/2018	25/03/2018	4.04	106	69.1
2017	08/03/2017	11/03/2017	5.46	92	70.24
2016	15/03/2016	21/03/2016	5.96	158	61.42
2015	07/03/2015	16/03/2015	4.94	116.9	73.9
2014	05/03/2014	12/03/2014	5.58	141	72.4
2013	25/03/2013	02/04/2013	3.56	109	63.66
2012	05/03/2012	09/03/2012	6	93	86.48
Cyfartalog / Average	8 Mawrth / March	13 Mawrth / March	5.25	114.58	70.25

2023 saw both plants flower later than the overall average. 2018 saw the same flowering date for the crocus, and only two years saw later flowering dates than this. Only two years saw later flowering dates for the daffodils. It's interesting to compare results from 2023 with the overall averages for the project. The table shows that 2023 saw slightly above average temperatures and rainfall and lower than average hours of sunshine.



The bar chart shows the average flowering dates since our UK wide investigation began in 2012. The average flowering date for 2022 for both the crocus and daffodil dates combined is 17 March. Which years saw later flowering dates?

[Click here to see if you are right!](#)

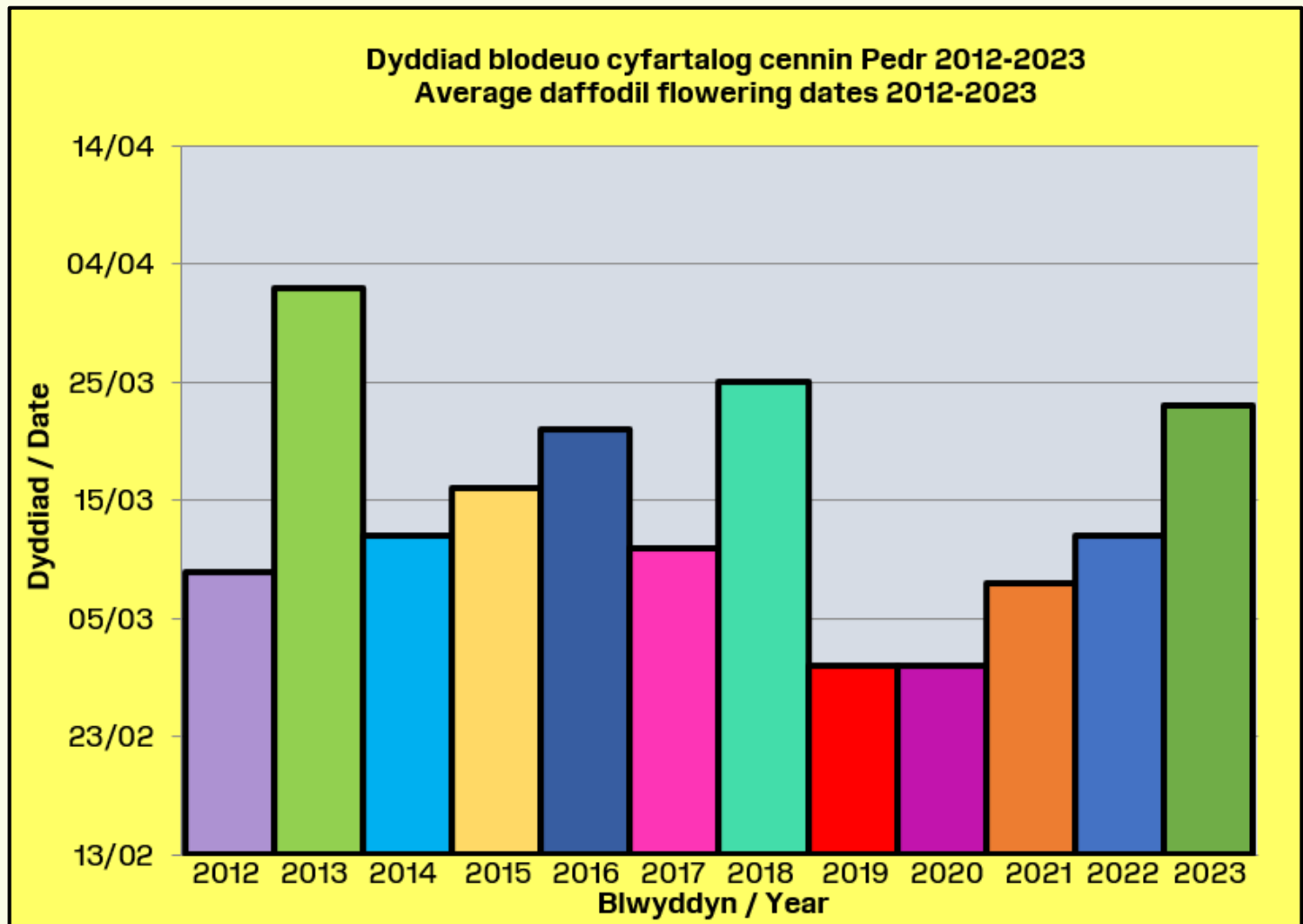
# Why did our plants flower later this year?

- We might have expected our plants to flower earlier because temperatures were slightly higher than average for the period November to March. However, 2023 saw lower than average hours of sunshine for this period.
- Our data shows a direct correlation between average temperatures, sunlight hours and the flowering dates of our bulbs.
- There are a lot of elements that can affect the flowering dates of our plants. It's important to not only look at the overall temperatures, rainfall and sunshine, but to explore how these altered over the period in which our plants were growing.

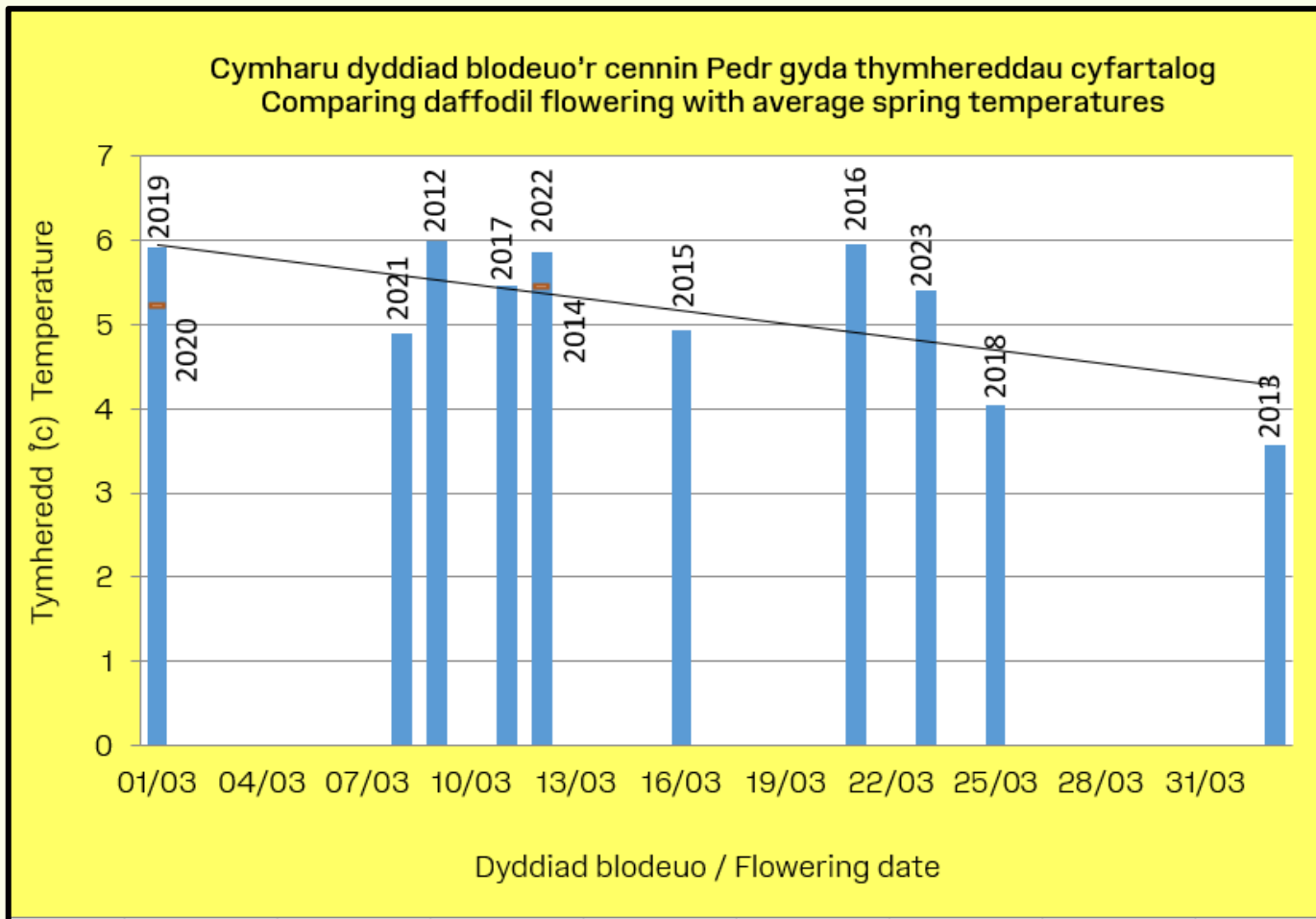




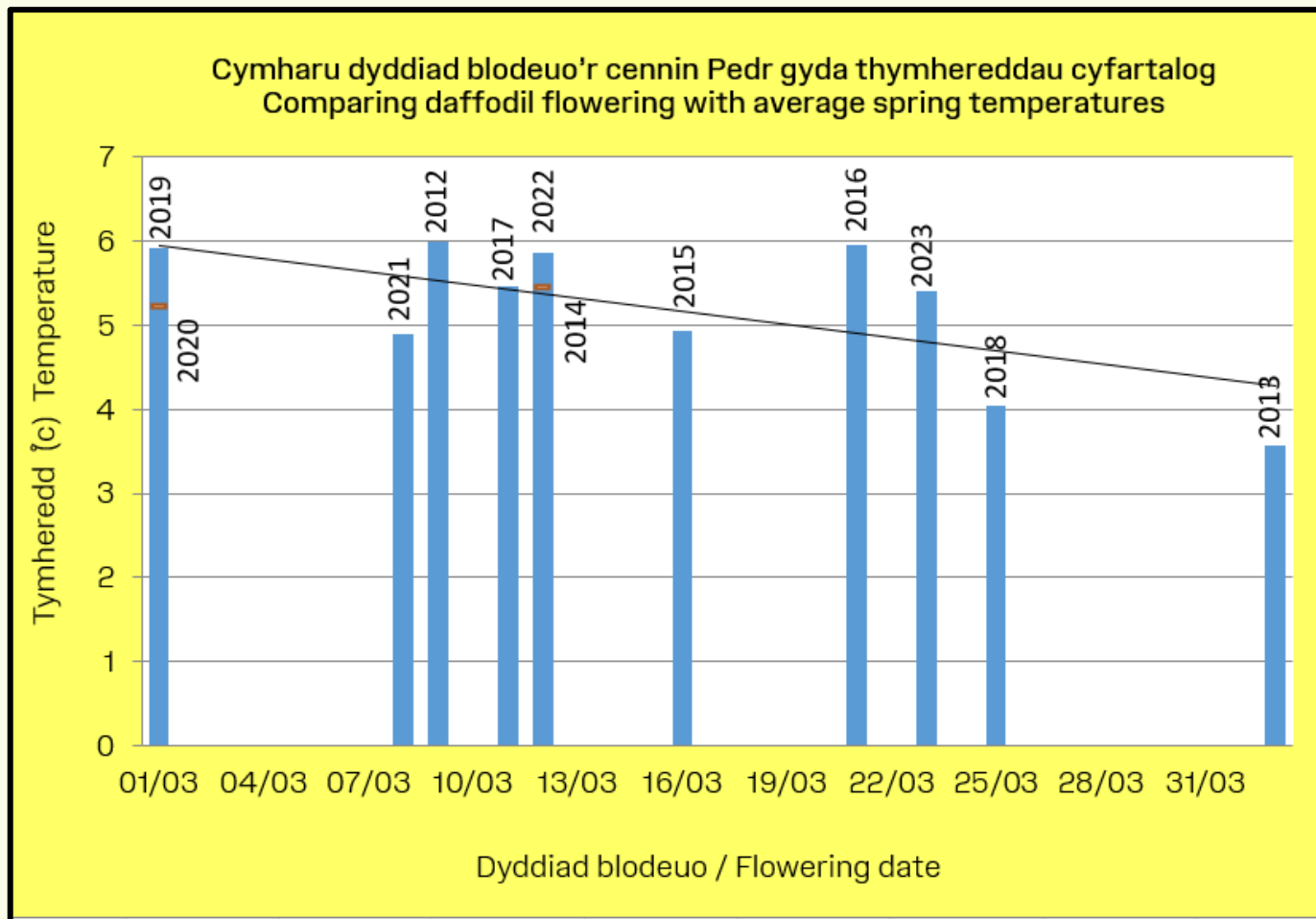
**How does the weather effect  
flowering dates for daffodils?**



The bar chart shows that 2023 saw later than average flowering dates for the daffodil when compared to previous years.



The chart shows the effects of temperature on flowering dates for the daffodil. The height of the blue lines illustrates the temperature and where they are on the graph relates to the average flowering date for that year. The black line running across the graph shows the trend, this indicates the pattern we would expect to see from our results.



The trend shows that daffodils flower later when temperatures are lower. But there are some exceptions, can you spot them?

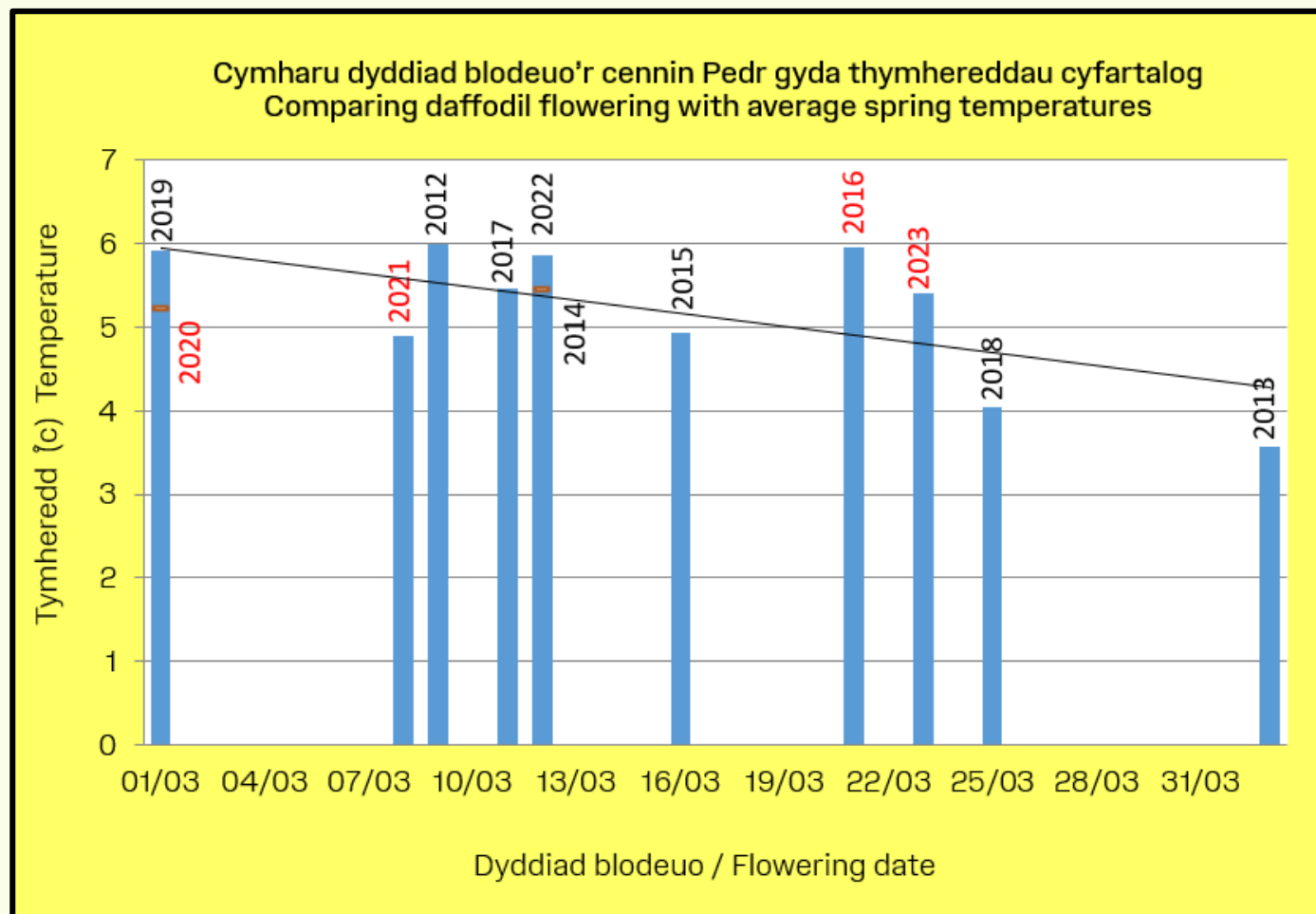
Top tip: The black line is only an indication of the pattern we'd expect to see. Years don't have to meet this line exactly to fit our trend.



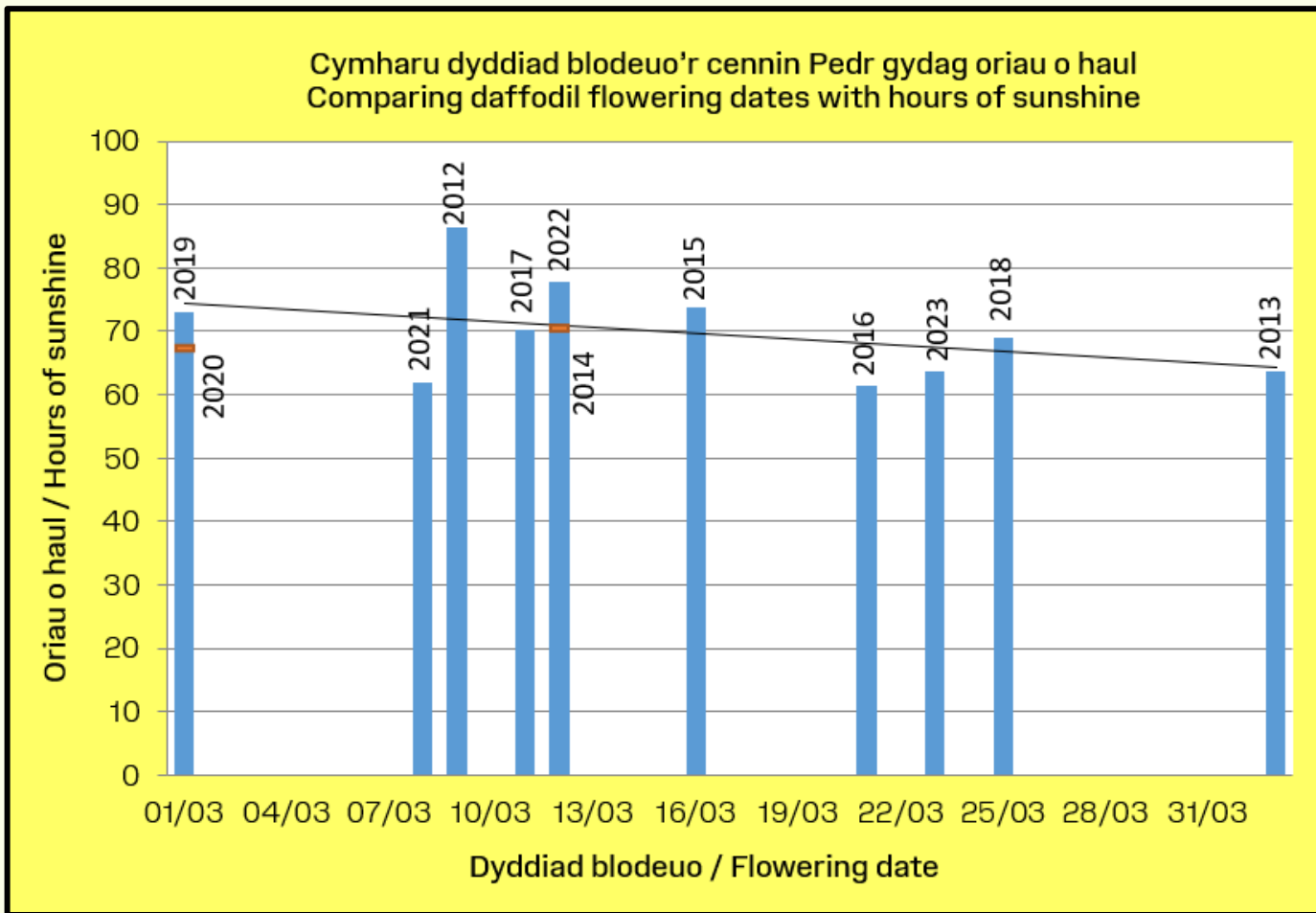


Q: What years don't fit the trend?

A: 2016, 2020, 2021 & 2023

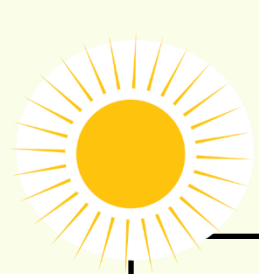


We would have expected daffodils to flower earlier than they did in 2016 and 2023. However, 2016 saw lower than average temperatures for February and March and 2023 saw lower than average temperatures for December. We would have expected daffodils to flower later in 2020 and 2021. However, 2020 saw the highest temperatures of our project for January and above average temperatures for February and 2021 saw above average temperatures for March.



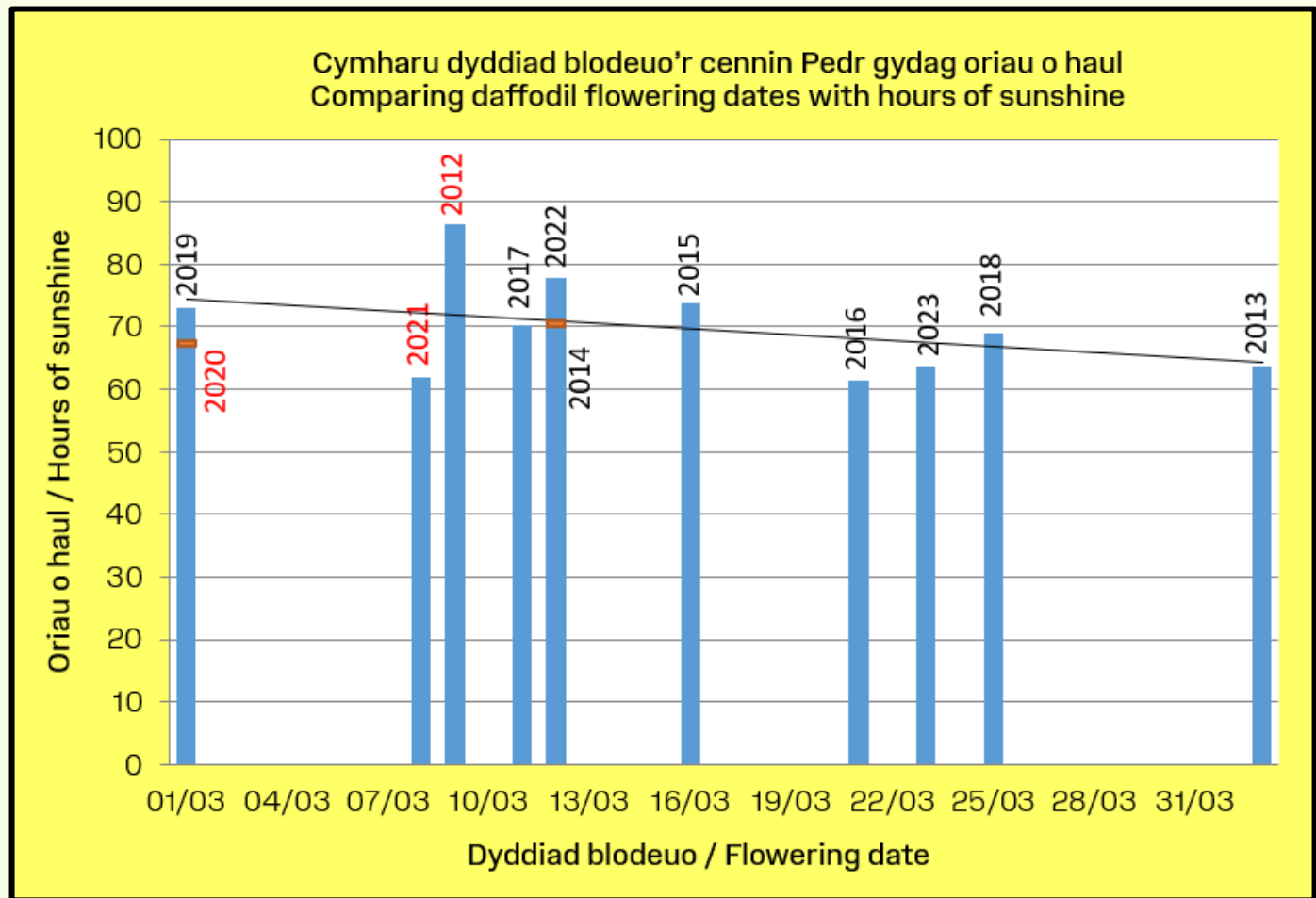
The trend shows that when hours of sunshine are lower, daffodils open later. But there are some exceptions, can you spot them?

Top tip: The black line is only an indication of the pattern we'd expect to see. Years don't have to meet this line exactly to fit our trend.



Q: What years don't fit the trend?

A: 2012, 2020 and 2021

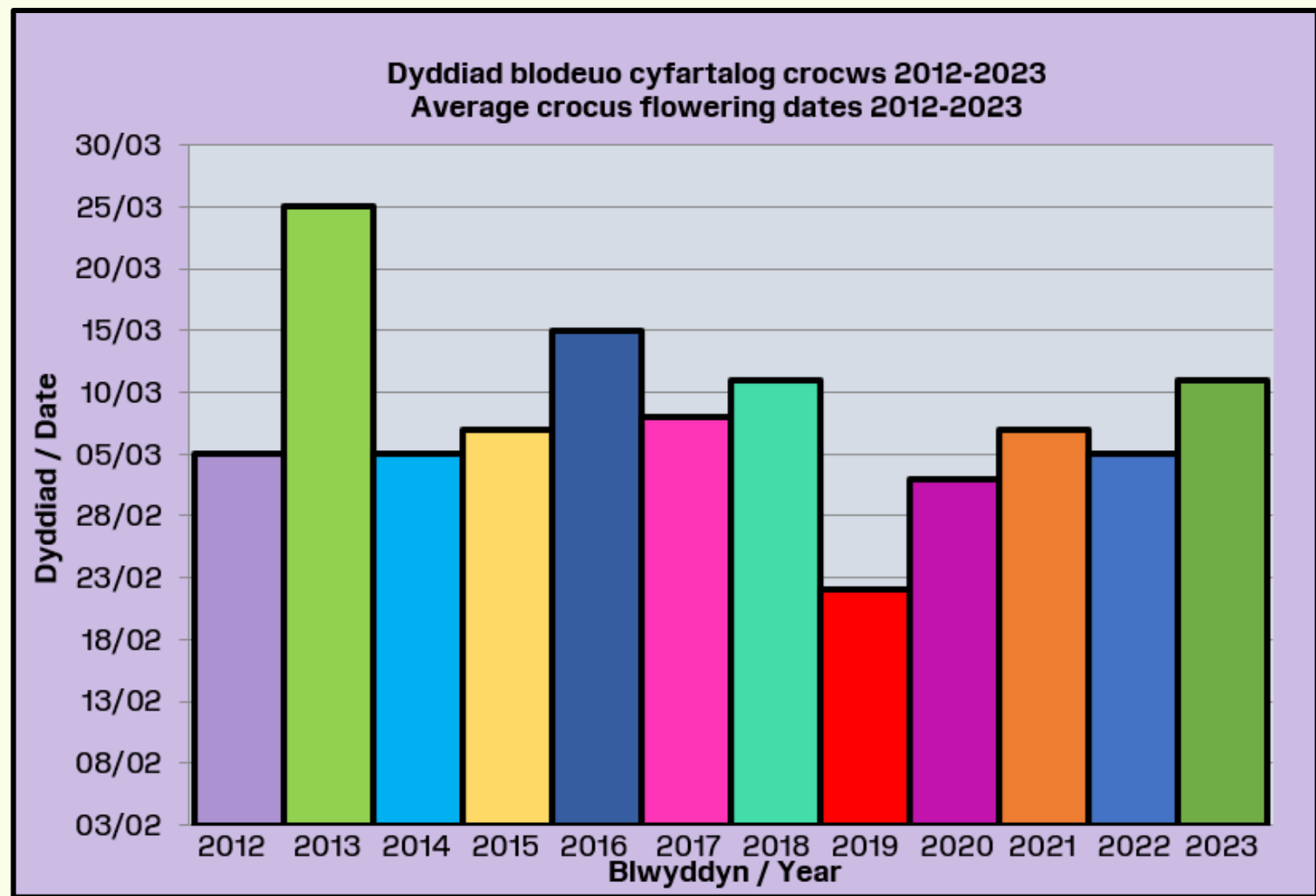


**Possible explanation:** We would have expected daffodils to flower earlier in 2012 because this year saw the highest hours of sunshine. However, hours of sunshine and temperatures were below average in December and February of this year.

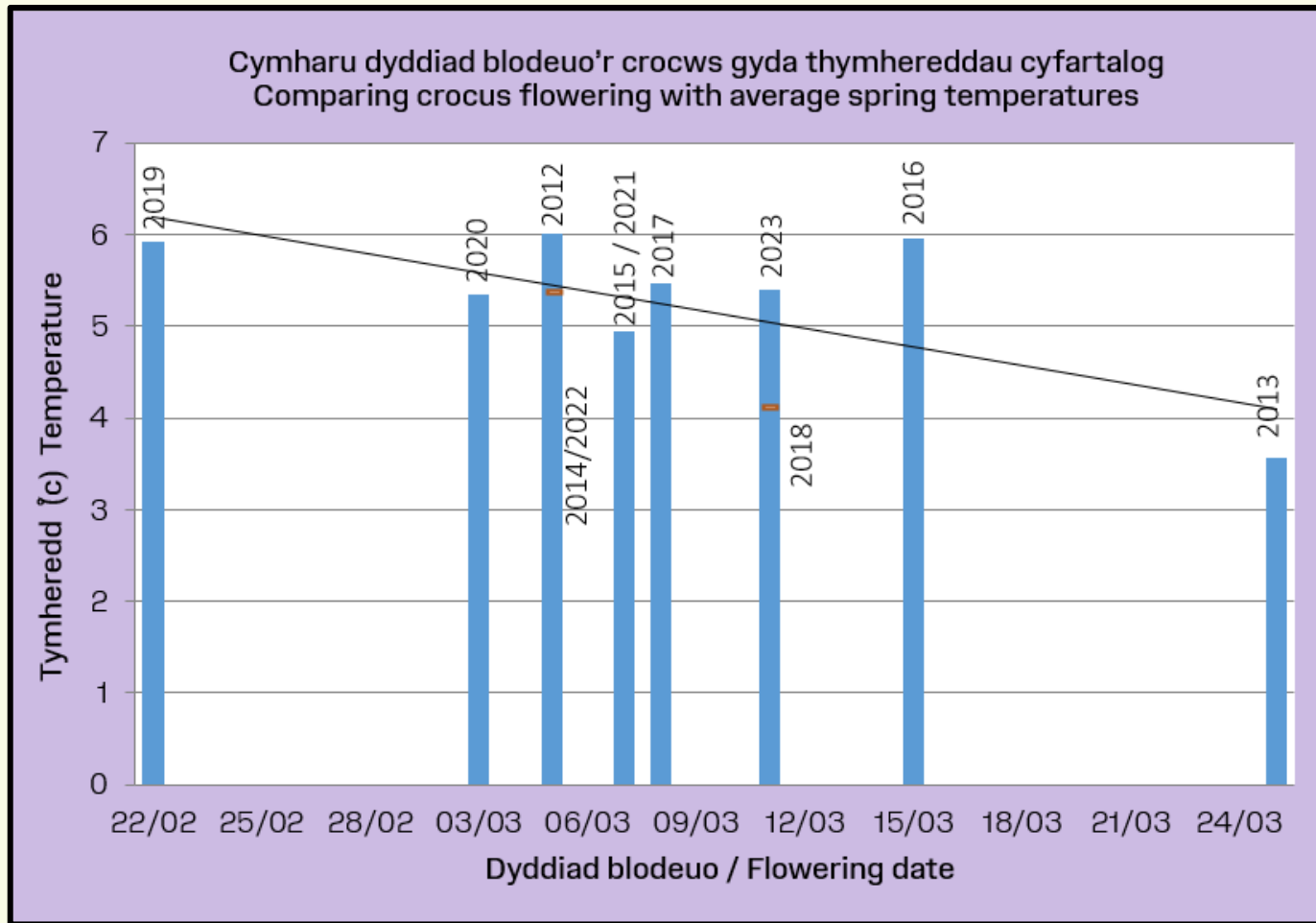
We might have expected plants to flower later in 2020 and 2021, but 2020 saw the warmest January of the project and 2021 saw temperatures and hours of sunshine increase sharply for February and March.



How does the  
weather effect  
flowering dates for  
the crocus?



We can see from the bar chart that crocus plants flowered earliest in 2019 and latest in 2013. 2023 saw later than average flowering dates for the crocus.

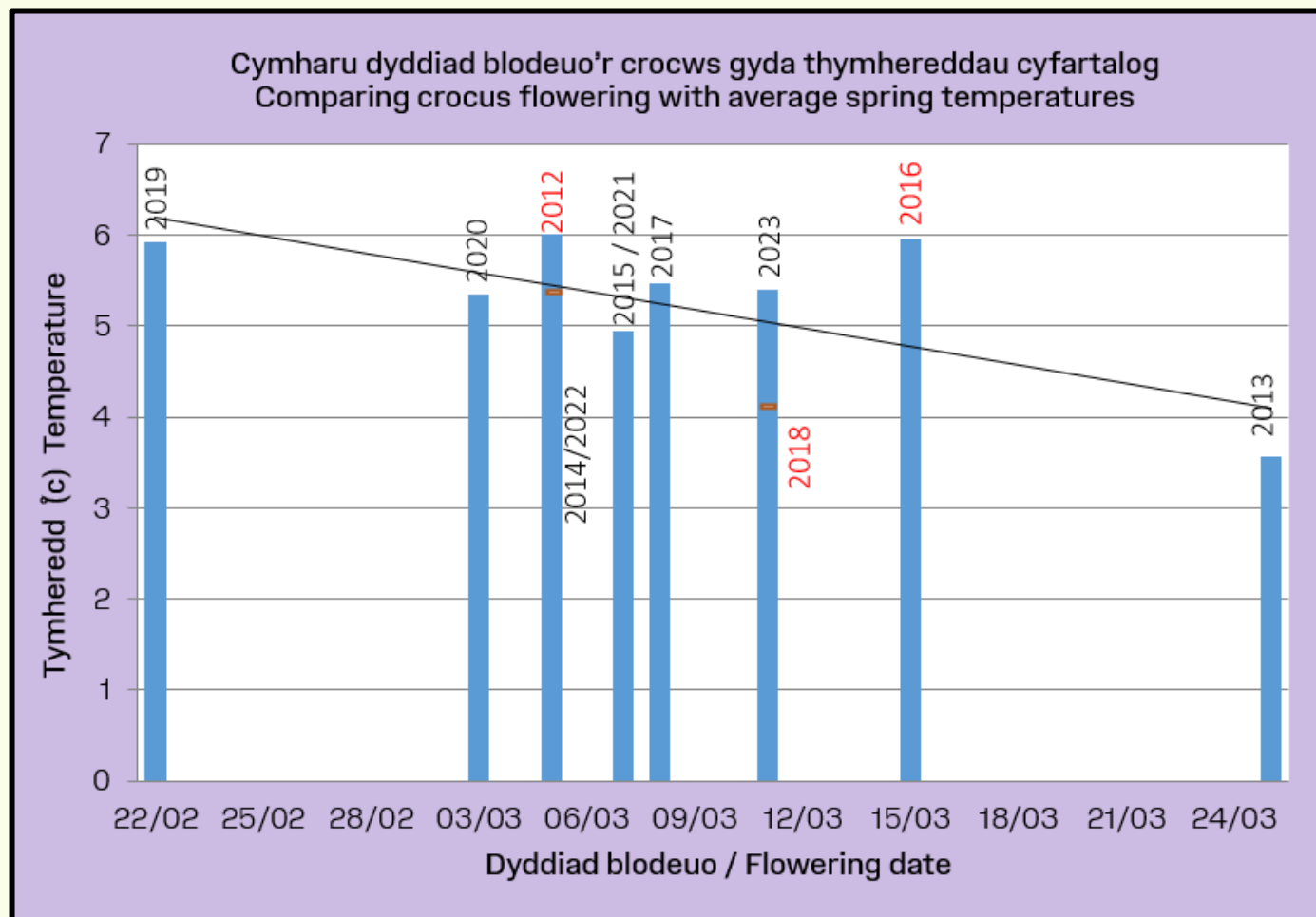


The trend shows that crocus flowers open later when temperatures are lower. There are some exceptions, can you spot them? What might be the cause?



**Q: What years don't fit the trend?**

**A: 2012, 2016 & 2018**

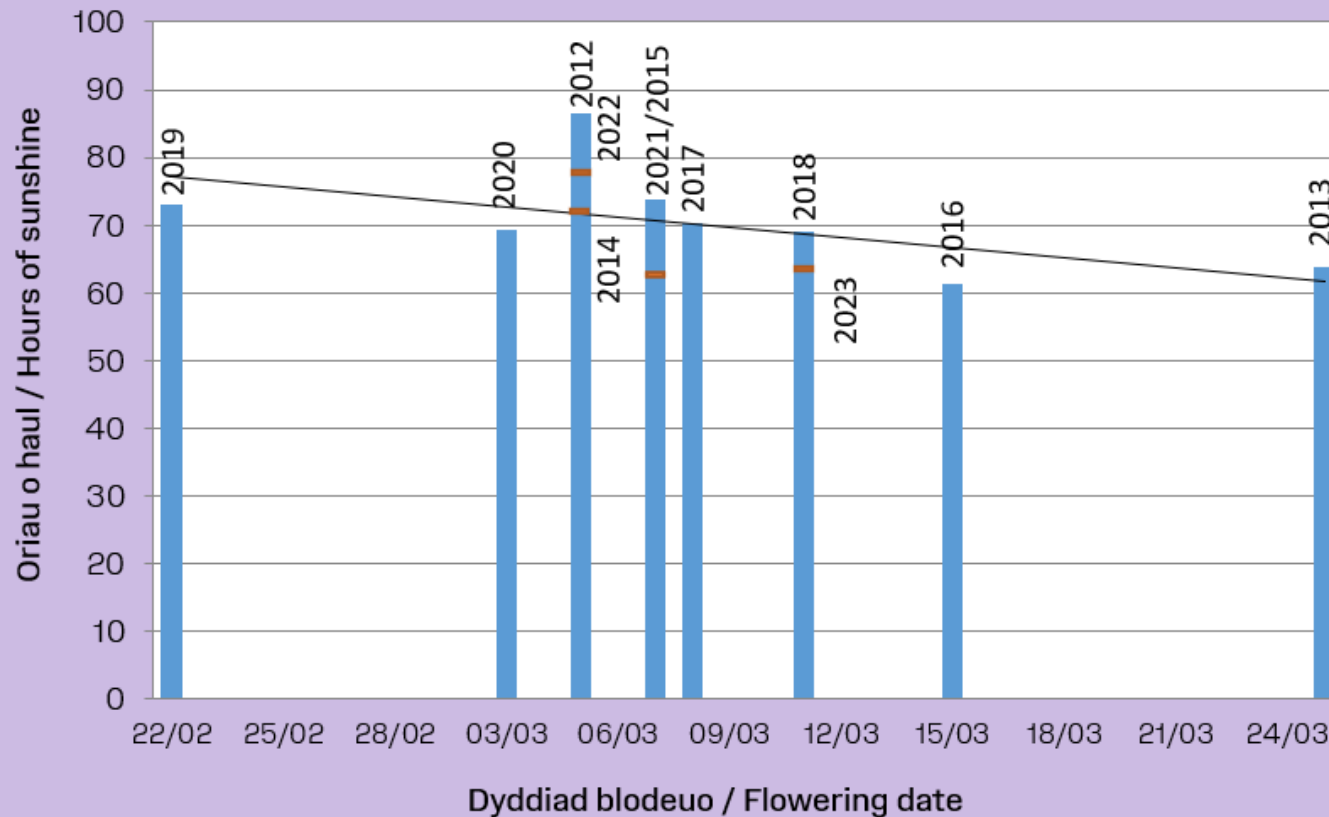


**Possible explanation:** We might have expected plants to flower earlier in 2012 & 2016. By looking at our other graphs we can see that 2016 and 2012 saw a sharp decrease in temperature in February.

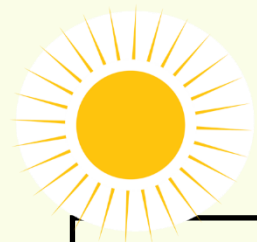
We might have expected plants to flower later in 2018. However, this year saw the highest hours of sunlight for January since our project began. This may have impacted on the flowering dates of our plants.



Cymharu dyddiad blodeuo'r crocws gydag oriau o haul  
Comparing crocus flowering dates with hours of sunshine

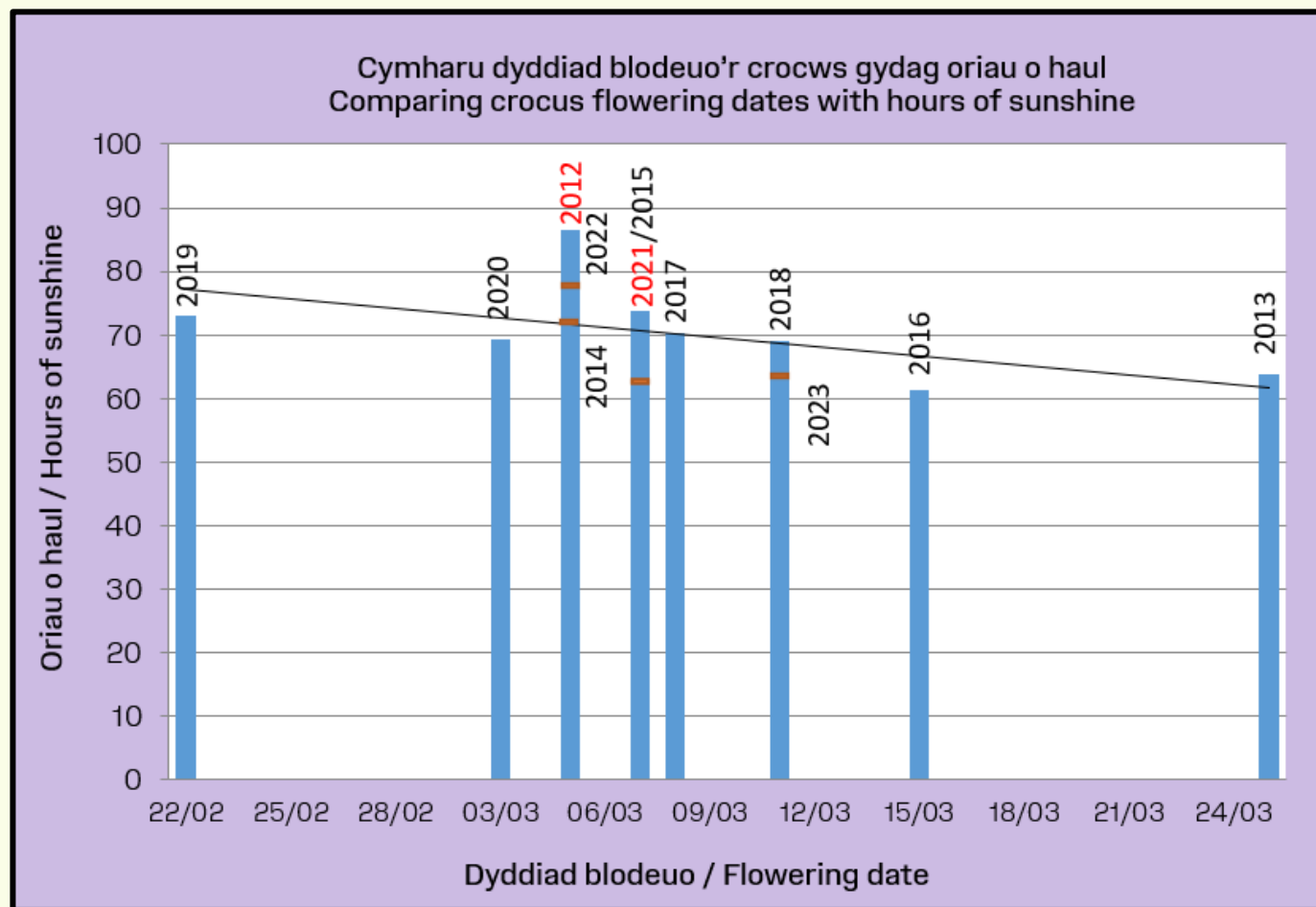


The trend shows that crocus flowers open later when there is less sunshine. There are some exceptions, can you spot them?



Q: What years don't fit the trend?

A. 2012 & 2021



**Possible explanation:** We might have expected plants to flower earlier in 2012 as it had high overall temperatures and hours of sunshine. However, it had lower than average temperatures and hours of sunshine for February.

We might have expected plants to flower later in 2021. However, a look at our earlier graphs shows that this year saw higher than average temperatures for January and March. It's likely that this impacted on the flowering dates of our plants.

# Finding a trend can be difficult, but some things are clear...

- Bulbs rely on both sunshine and warmth to flower.
- The seasons are becoming more unpredictable as the planet warms.



# Download the results yourself to...

- ▶ Make graphs and frequency charts to calculate the mean.
- ▶ See if flowers opened later in schools that recorded colder weather.
- ▶ See how temperature, sunshine and rainfall affect average flowering dates.
- ▶ Look for trends between different locations.

Visit: <https://museum.wales/spring-bulbs/>



# Digital Resources

Visit the [Spring Bulbs for Schools website](#) and [The Edina Trust website](#) for an array of teaching resources relating to the project.

[Amgueddfa Cymru - National Museum Wales](#) have digital resources that relate to collections across their seven Museums. Schools in Wales can also access resources on the [Hwb website](#).

The above pages all have links to our Kahoot quizzes!

# Kahoot!

