

Learning Intentions

For students to:

- Analyse evidence and draw and justify conclusions
- Work effectively in a group
- Use new vocabulary such as phenology

Context:

- Poem by William Wordsworth
- Phenology information sheet

Resources

Provided

- Poem by William Wordsworth 'Daffodils'
- Worksheet for students
- Case study on Cherry blossom festivals

Needed

- Computers for research

Links to National Curriculum subjects

Geography KS2

Enquiry and skills (1a, 1c, 1e, 2a)
 Knowledge and understanding of places (3c, 3d, 3e)
 Patterns and processes (4b)
 Environmental change and sustainable development (5a, 5b)
 Breadth of study (6e)

Geography KS3

Enquiry and skills (1a, 1c, 1d, 1f, 2a)
 Knowledge and understanding of places (3d)
 Patterns and processes (4a, 4b)
 Environmental change and sustainable development (5a, 5b)
 Breadth of study (6d, 6k)

6. Blooming early

Overview

'Blooming early' encourages students to become aware of the effects of climate change on flowering times. Students explore why daffodils are blooming earlier each year and consider the implication for future cultural festivals.

Teaching activity

Questions that link personal meanings to certain dates in the calendar can be useful starters for a lesson about climate change, particularly if the lesson goes on to look at changes on the macro scale such as melting polar ice caps, which may not be part of the learners' experiences. Plants are so much a part of our everyday lives that we often miss the problems they face with climate change. It is only when we need them for a particular day that the problem stands out. Our own important days are also often linked to particular plants and can be a useful way of connecting students' thoughts to their environment.

- Read the poem 'Daffodils' by William Wordsworth to the students (see over).
- Ask the students what time of year they think Wordsworth wrote this poem. Explain to them that the poem was first written 200 years ago.
- Show the students the quotes from Hilary, and Glenys. What do they think is the reason for daffodils flowering earlier in the year? Kew Gardens has an information sheet about Phenology, which looks at the influence of climate on flowering times (<http://www.kew.org/ksheets/pdfs/K36-black.pdf>). There is evidence that daffodils have flowered earlier and earlier over the last 50 years.
- Ask the students what flowers are around for their birthday. What flowers might be around for their birthday in 25 years time, if the climate continues to warm. This could lead to an interesting discussion about flower cultivation.

My name is Hilary and I own a flower shop in North Wales. People here buy daffodils for St David's day on the 1st March. Usually, I can buy daffodils from local growers in time for the big day. I buy daffodils from Aalsmeer in the Netherlands, they have an enormous flower auction every day and lorries come over on a Tuesday with fresh flowers for my shop. Sometimes I buy daffodils from The Netherlands to celebrate St David's day. If we have a mild spring, like two years ago, then it is a problem, because the daffodils have finished, or people already have them in their gardens, and don't want to buy mine. If the daffodils get any earlier then I will have to buy them from colder places further north, from Scotland!

Hilary, 2009

My name is Glenys I remember daffodils in the garden for birthday parties as a child 50 years ago, but sometimes now there are no daffodils there on my birthday. Sometimes they are so early that they have finished by the middle of March. This year because the snow lasted a long time, there were more daffodils about than usual on my birthday.

Glenys, 2009

“I Wondered Lonely As A Cloud”

William Wordsworth

I wandered lonely as a Cloud
That floats on high o'er vales and Hills,
When all at once I saw a crowd,
A host, of golden Daffodils;
Beside the Lake, beneath the trees
Fluttering and dancing in the breeze.

Continuous as the stars that shine
And twinkle on the milky way,
They stretched in never-ending line
Along the margin of a bay:
Ten thousand saw I at a glance,
Tossing their heads in sprightly dance.

The waves beside them danced;
but they
Out-did the sparkling waves in glee:-
A Poet could not but be gay
In such a jocund company:
I gazed---and gazed---but little thought
What wealth the show to me had
brought:

For oft when on my couch I lie
In vacant or in pensive mood,
They flash upon that inward eye
Which is the bliss of solitude,
And then my heart with pleasure fills,
And dances with the Daffodils.

Published in *Collected Poems*, 1815

Follow up activity

Using the information from Kew's phenology sheet ask students to draw a pictogram that shows the change in flowering dates for a range of plants. Ask them to predict which month these plants might flower in 25 years time.

Encourage the students to use the internet to find out more information about other festivities which use flowers and rely on them being in season (See the case study below on the flowering cherry festival in Japan).

Keep a school phenology diary, encouraging students to note flowering times of plants around the school.

Assessment

Pupil worksheets assessed for levels of response

- No recognition of role of climate change on plants and flowering times
- Some recognition of role of climate change on plants and flowering times
- Notice made of small details and an awareness of the role of climate change in the timings of flowering times
- Awareness of the role of a responsible citizen to alter the factors which are causing the change in flowering times.

Visits to botanic gardens

This activity is very well suited to a botanic garden as it relies on knowledge of plant flowering times.

Case study: Cherry blossom festivals

Phenology is the study of the timing of natural events – like when flowers first appear, when leaves first start to grow on trees, when insects appear and when birds come back from their migrations. It can also be used to study the end of a season – for example, when leaves fall from trees.

For hundreds of years people have recorded and documented these kinds of events and it's becoming even more important in light of climate change. Spring is happening earlier and earlier each year – so phenological records are becoming increasingly important because they are proof that the natural world is already responding to climate change. Of all the characteristics of plants that relate to climate change, the timing of flowering is the one for which there are the most observations.

One example of this comes from Japan. In Japan cherry blossom festivals, called 'Hanami', are hugely popular and culturally significant. Every year, since the 9th Century, huge festivals and celebrations are held throughout the country as the blossom appears on the cherry trees. During modern festivals, people of all ages spend time outdoors, enjoying the beauty of the cherry blossoms by day and by night, with their family, friends, and workmates. Festival activities include eating seasonal foods, such as bamboo shoots, rice cakes with red beans, and wild vegetables, playing games, listening to musical instruments and singing.

Because of this the flowering times of cherry blossom have been recorded and documented for over around 1,200 years. This unbroken record can help us to reconstruct the past climate and demonstrate the local increase in temperature associated with climate change and urbanisation. All together, the flowering record shows a six-week range in flowering dates from as early as late March to as late as early May. Extreme flowering dates are scattered throughout this period.

However, after approximately 1830 flowering times become progressively earlier. By the 1990s average flowering times had become earlier than at any time previously during the entire flowering record.

This record is probably the longest annual record of phenology from anywhere in the world and shows that cherries are currently flowering earlier than they have at any time during the previous 1200 years and that this is due to temperature increases.

Ref: Richard Primack and Hiroyoshi Higuchi; *Climate Change and Cherry Tree Blossom Festivals in Japan*, *Arnoldia*, 65:2, 14-23

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- Which month of the year was Wordsworth wandering in the Lake District?
- Read the quotes below from Hilary and Glenys. What do you think is the reason for daffodils flowering earlier in the year?

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- Every year, for the past 50 years, scientists at Kew Gardens have collected information on the flowering times of plants. There is evidence that daffodils have flowered earlier and earlier over the last 50 years. See the Phenology Information Sheet from Kew Gardens.
- What flowers are around for your birthday? What flowers might be around for your birthday in 25 years time, if the climate continues to warm?
- In pairs, discuss the way in which your families use flowers to celebrate certain days, or use the internet to find out about flowers and festivals. What happens if the flower is difficult to find? Some good information is available about red roses for St Valentine's Day for example. Red roses are specially flown in from Kenya as roses do not usually flower in Britain in February.