Bud burst:
The opening of leaf buds in the spring brought on by the increasing temperatures.

Leaves fully open:
When a leaf has fully unfurled from the bud.

Leaf colouring:
When more than half of the leaves have changed their colour.

What is a phenophase?

A phenophase is a specific phase in the annual life cycle of a plant or animal, that has a clear starting and end point. For example, the period during which leaves are open fully on a plant.

PHENOLOGY is the study of how climate effects seasonal events in plant and animal life.

NATIONAL BOTANIC GARDENS
Phenology - Spring Watch Trail

Studying the growth of leaves, flowers and fruit through the seasons from bud burst in spring to leaf fall in autumn can tell us a lot about how our climate is changing. The study of these events is called **phenology**. Climate change causes the temperature to rise so we see leaves opening earlier in spring and butterflies appearing earlier too, and by studying it we can see the variations every year. You can become a 'citizen scientist' by recording leaf growth and bumblebees to help us monitor the effect of climate change on nature.

Name: _____ Age: _____ Date: _____ Time: _____

Spring ▉ Summer ▉ Autumn ▉ Winter ▉

1. Cherry - *Prunus*

The wild cherry *Prunus avium* starts to flower a little later than the blackthorn in April. It has white or pale pink flowers followed by glossy hanging cherries that ripen in the summer. These sour cherries provide food for larger birds especially starlings. Can you find any other *Prunus* trees?

Tick the boxes if you see any of these:

Dormant bud ▢ Bud burst ▢ Flowers ▢ Cherries ▢

Both the wild cherry and the blackthorn (stop 2) are also hedgerow plants. The blackthorn flowers earlier to avoid competition for pollinating insects, giving it more of a chance of being pollinated.

2. Blackthorn - *Prunus spinosa*

With their spiny thorns and dark bark, blackthorn *Prunus spinosa,* are covered in white flowers from March onwards. The flowers appear before the leaves and are one of the first sources of nectar and pollen for insects that emerge early in the spring. After the flowers are pollinated they will develop into dark purple sloes which provide great food for the birds in the autumn.

Tick the boxes if you see any of these:

Dormant bud ☐   Bud burst ☐   Leaves full ☐   Leaf colouring ☐   Leaf fall ☐

5. Willow - *Salix smithiana*

The willow tree, *Salix smithiana,* is one of the trees used by scientists to monitor 'bud burst' and other phenophases. Willows like to grow in damp places like this. They are home to lots of insects and so provide food for insect-eating birds in summer, especially the willow warbler. In spring, early flowers appear and produce nectar for bees, providing them with their first feast of the year.

Dormant bud ☐   Bud burst ☐   Leaves full ☐   Leaf colouring ☐   Leaf fall ☐

3. Oak - *Quercus*

Hundreds of insects, and many species of birds and mammals make their homes in oak trees. See can you find a young oak tree with the scientific name *Quercus robur*. There have been many uses for the oak down through the centuries from shipbuilding to barrel making.

Tick the box to show what phase most of the tree is in:

Dormant bud ☐   Bud burst ☐   Leaves full ☐   Leaf colouring ☐   Leaf fall ☐

6. Lime - *Tilia* 'Petiolaris'

Underneath the heart shaped glossy green leaves of the weeping lime, *Tilia* 'Petiolaris', you will find a dense layer of woolly hairs. The underneath of each leaf is also silver. In autumn these leaves turn a buttery yellow! Tick the box if you see any of these:

Dormant bud ☐   Bud burst ☐   Leaves full ☐   Leaf colouring ☐   Leaf fall ☐

4. Hazel - *Corylus*

In January and February you will see the long male yellow catkins like lambs tails on the hazel tree *Corylus avellana*. Part of the tiny red female flower, if pollinated, will turn into a hazel nut in the autumn. In the story *Fionn Mac Cumhaill and the Salmon of Knowledge,* the salmon got all its knowledge from eating the nuts from a magical hazel tree!

Tick the box if you can see any these:

Catkins ☐   Flower ☐   Dormant bud ☐   Leaves full ☐   Nuts ☐

Bumblebees

There are 21 different bumblebee species in Ireland and many are threatened with extinction. See how many you can find pollinating our spring flowers. Is the weather:

cold ☐   warm ☐   windy ☐   cloudy ☐   sunny ☐   rainy ☐

How many bumblebees can you count during your walk? ☐
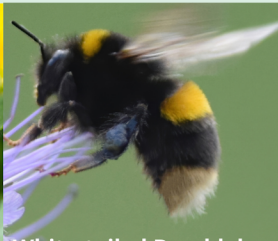How many different types (species) can you see? ☐
Do you see any of the bumblebees in the photos? ☐

Common Carder Bee   **Red-tailed Bumblebee**   **White-tailed Bumblebee**   **Garden Bumblebee**