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Classroom Resource

Investigating Hedgerow Habitats

Science Foundation Ireland
SFI For what's next

Investigation

Investigating Hedgerow Habitats

The investigation of existing hedgerows is best suited to spring/summer when hedgerows are in full leaf, many are in bloom, and insect activity is high. However, it can also be done on an uncut hedge in early autumn when leaves and fruits are still on the hedges. The planting part of the project is best suited to autumn or winter but can be done at any time of the year.

Class Level - All levels (with adaptations)

Curriculum Links

Strand:	Environmental Awareness and Care; Living Things
Strand Unit:	Environmental Awareness; Science and the Environment; Caring for the Environment; Plant and Animal Life
Curriculum Objectives:	Recognise how actions of people may impact upon the environment; Identify and discuss a local, national or global environmental issue; Observe, discuss and appreciate the attributes of the local environment; Observe, discuss and identify a variety of plants and animals in different habitats in the immediate environment; Observe, identify and investigate the animals and plants that live in local environments; Explore some examples of the interrelationship of living and non-living aspects of local and other environments; Realise that there is personal and community responsibility for taking care of the environment
Skills Development:	Questioning; Observing; Exploring; Predicting; Planning; Investigating; Estimating and Measuring; Recording and Communicating; Collaborating; Ask questions that will identify problems to be solved (how many hedging plants required)
New words/vocabulary:	Hedgerow, Biodiversity, Boundary, Predator, Wildlife Corridor, Native, Pollinator, Invasive, Herbicide, Pesticide, Fungicide, Management, Habitat, Ecosystem
Focail nua:	Sceach (hedgerow); Gnáthóg (habitat); Fiadhúlra (wildlife)
Cross curricular links:	English (new words and procedural writing); Maths (capacity/weight); History (traditions around trees and plants)
Equipment/materials	• For planning hedgerow: Measuring tape (20m), metre sticks • For planting hedgerow: Hedging plants, spades, compost, Mypex (weed control fabric)

Engage

Prompt questions

- Hedgerow biodiversity video by Tipperary Farmer (5 mins) (https://www.youtube.com/watch?v=g9MDO_5q25U&feature=emb_logo; https://pollinators.ie/videos/)
- Managing hedgerows video by Tipperary Farmer (5 mins) https://www.youtube.com/watch?v=ZXETU0gZ9Y0&feature=emb_logo; https://pollinators.ie/farmland/
- Get a copy of the How-to-guide: Hedgerows for Pollinators available for free download from the All-Ireland Pollinator Plan website. Discuss this resource with the learners.
- Take a walk to a nearby park or any place in or near the school grounds with a hedgerow.
    - Ask the learners what a hedgerow is.
    - Can they find a hedgerow in the park/ school grounds?
    - What kinds of plants are in hedgerows – do they recognise any of them?
    - What is the purpose of hedgerows?
- Look at your school boundary – is there a hedgerow there? If you were a small bird or mammal, how would you safely get from one side of the school to the other without being seen by predators flying overhead?
- Looking at the hedgerow, imagine you were a hungry pollinator or other animal - could you find food in the hedgerow (flowers/fruit/ insects)?
- What are the benefits of planting hedgerows? Check out the Hedge Laying Association of Ireland website.
- What animal do you think of when you hear the word 'hedgerow'?
- Discuss books about the myths and folklore surrounding our native plants http://www.books.ie/ireland-s-trees-myths-legends-and-folklore or http://www.books.ie/ireland-s-wild-plants-myths-legends-and-folklore

Background information:

A hedgerow is a living structure comprising a line of trees and shrubs usually planted at the edges of fields as boundaries. They act as a substitute for woodland edges as there is little native woodland left in Ireland. Historically, hedgerows were planted in the countryside on farms to stop cattle and sheep escaping, and also to mark farm and townland. In the past, species growing in our native hedgerows were used for food, drink and herbal medicine.

Hedgerows are rich in biodiversity. They provide an important habitat for a wide range of animals, including, birds, mammals, and insects. They also provide a habitat for native wildflowers. Hedgerows provide food and shelter for insects, birds, bats and other wildlife. Hedgerows act as wildlife corridors or 'highways' for animals to move safely from one habitat to another and are a vital part of our countryside and urban landscape.

Threats to hedgerows include inappropriate management such as illegal cutting of hedgerows and spraying of chemicals (herbicides, pesticides, fungicides). The impact of cutting hedgerows at the wrong time of year includes removing essential flowers/berries/nuts before they develop and disrupting nesting sites. Further threats include hedgerow clearance for the development of land and for agricultural expansion.

Real World Application:

Hedgerows store carbon which helps mitigate climate change. It is illegal to cut hedgerows between 1st March and 31st August (Wildlife Act 1976). Cutting hedgerows during this period is potentially lethal to chicks nesting. It also removes vital food sources for insects (including pollinators), birds and other animals. Hedgerow cutting is only permitted during this period in cases of road safety concerns, i.e. hedgerows obscuring road signs, or impacting pedestrians, cyclists and motorists safe use of the road.

For creating a new hedgerow, hedging plants can be bought from nurseries/growers as bare root young plants (saplings). These saplings are dug up to order and are delivered bare rooted, i.e. not in a pot. This is a cheaper way to purchase a large quantity of hedging plants. In garden centres, the hedging plants are usually more mature and are in compost in plastic pots, i.e., the roots are not exposed.

When planting a hedgerow, it is best to plant in two rows that are staggered and to have a variety of native species. This will result in a fuller and thicker hedgerow which will provide a better and safer wildlife corridor and provide food and shelter for wildlife throughout the seasons.

Often when new housing/retail developments are planned and built, the planting of hedges or other planting schemes doesn't include many native plants or pollinator friendly plants. Gardeners and developers should always include native pollinator-friendly plants. Native Irish plants and animals have evolved together and are hugely dependent upon each other. Introductions of non-native (and potentially invasive) species can interfere with this delicate ecosystem.

Many companies and businesses have committed to support the All Ireland Pollinator Plan, which brings farmers, local authorities, schools, gardeners and businesses together to try to create an Ireland where pollinators can survive and thrive, including. Native hedgerow planting is one of the recommended actions of the plan.

Explore (All classes)

Once you have identified a hedgerow, allow the learners to walk along the hedgerow to explore. This is a great opportunity to use hand lenses or magnifying glasses to see the detail of the leaves, flowers, fruit, bark, insects, lichens, etc. Remind the learners to be careful of any thorny plants and nettles (don't grab at plants – examine them first for thorns before touching).

- How many different species of plant are growing there? (it is not necessary to know names, as the difference can been seen in the leaves/flower/fruit etc.).
- Are there any insects on the underside of the leaves or on the bark?
- Are there thorns on any of the plants?
- Are the leaves all the same shape and colour?
- What are the flowers/fruit like?
- How high is the hedge? (Learners can estimate the height of the hedge using their own body height).
- Learners can count the number of individual plants along a specified length of hedgerow (Look at the base of the hedge to see the individual trunks).
- Does the hedgerow connect to another habitat e.g. a field, a riverbank, a meadow, a woodland?
- Who is responsible for cutting the hedge?
- Do they like the hedge? Does it make the park/school look better than if there was none? Why?

If there is no hedgerow in the school grounds, the learners could consider where one could be planted. What method would you use to measure the area for planting a hedgerow?

Investigate

Starter Question (Older classes)

How much would it cost to plant a hedgerow along the school boundary? (Even if there is a hedgerow in place, the calculation can be carried out based on that hedgerow).

The learners will be investigating three aspects of hedgerow planting to calculate the cost:

1) What is the length of the school boundary where a hedgerow could be planted?
2) How many plants are needed to plant a hedgerow along this boundary?
3) How much will it cost?

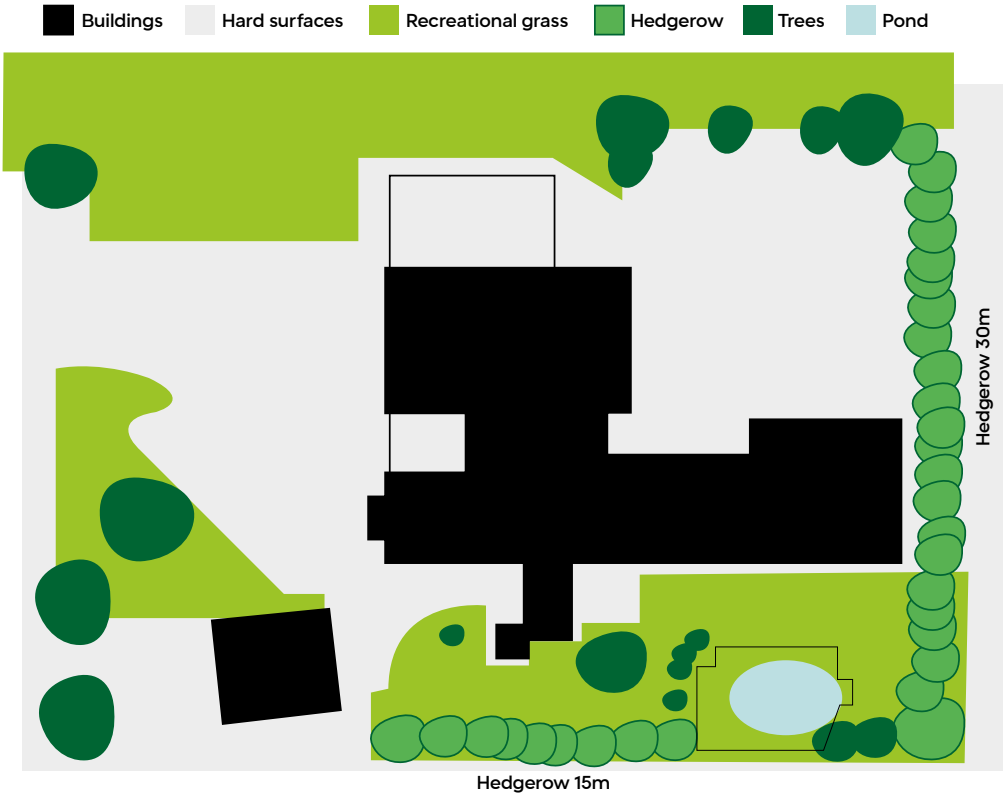
Prediction

Estimate the length of the school boundary where the hedgerow could be planted. It is important at this point to determine where the school boundary is and what part of it will be considered for hedgerow planting. Choose a start and finish point and then make the predictions.

Estimate the number of plants required and the estimated cost.

HEDGEROW SIZE AND COST CALCULATIONS		**Estimate**	**Actual**
Length of school boundary	Distance in metres		
Total number of plants needed (Remember you will need a double row of hedging)	2 plants per metre		
Total cost of plants for hedgerow	*Cost per plant (€)		

* Learners should estimate the cost of hedgerow plants. Find details of native hedgerow species in the *How-to-guide: Hedgerows for Pollinators* and research the cost from local nurseries or growers.



Conducting the investigation

Prior to starting the investigation consider the measurement method and cost per plant.

Measurement method:

Three methods of measurement will be used, with the results compared between groups at the end of the investigation. The learners will work in groups. Each group will use one method of measurement. These methods are:

1. Footsteps
2. Fence/wall widths
3. Measuring tape

Method 1: Using the metre sticks, the learners calculate how many footsteps are in one metre. This is best done with the learner using their normal walking stride, e.g. two strides per metre. They then walk the proposed boundary counting strides. One learner should do the walking and one should record. The learners should decide in advance how best to do this, as it is easy to lose count when walking a long distance.

How many footsteps in 1 metre?	How many footsteps in total?	Total length in metres

Method 2: Using the metre sticks, the learners calculate how many metres in one fence panel width (or between two wall pillars). Then count how many fences/wall pillars are in the proposed hedgerow area. The learners need to determine if all fences are the same width (or distance between wall pillars is equal). If there is a smaller fence/wall width at the end of the boundary, the learners need to decide how to include this in their calculations.

Width of one fence in metres	How many fences	Total length in metres

Method 3: Using a 20m measuring tape (or whatever size is available), the learners calculate the length of the boundary for the hedgerow.

Total length of measuring tape	Number of measuring tape lengths	Total length in metres

Cost per plant:

The learners can be told the cost by the teacher, or they can research the cost of native hedging plants online.

The learners need to remember that the hedgerow will be planted as double rows and should include this in their final calculation.

Interpreting data/results

- Did the results match the predictions?
- Was there much difference in the final results between the methods of measurement?
- How will you present individual group data?
- How will you present all groups data together?
- Were you surprised at the number of plants needed and/or the total cost?

Take the Next Step

Adapt for home:

This could be adapted to home if there is garden space to plant a small number of hedging plants. However, the calculation for hedging can be carried out in any space.

Adapt for junior level:

Junior learners can carry out the hedgerow exploration as outlined for Senior learners. Junior learners can count how many footsteps there are in a specified length of the school boundary/ fence.

Follow-up challenge/project/citizen science link:

- A hedgerow planting project is a fantastic project for the whole school. This allows the learners to take ownership of the hedgerow. This is a big project, so it is best undertaken with the help of an expert. The Heritage in Schools Scheme, which is run by the Heritage Council, has a list of experts that the school could contact. Be sure to use the *How-to-guide: Hedgerows for Pollinators*.
- Can you find out if any companies/businesses in your area have committed to support the All-Ireland Pollinator Plan? Learners can access the Junior All Ireland Pollinator Plan online to learn about the actions they could implement in their school. It doesn't have to be a hedgerow! There are many simple ways to help our pollinators and native plant species.
- Check out the craft of hedge laying on the Hedge Laying Association of Ireland website. The current emphasis on hedgerow planting, management and conservation has resulted in a revival of this traditional country craft.