



UNDERWATER GARDENER ACTIVITY GUIDE AGES 11-14



OVERVIEW

This activity guide introduces the topic of Underwater gardening, allowing you to explore ways to plant seagrass.

- **Lesson Objective:** to actively participate in seagrass conservation.
- **Curriculum links:** Geography/Science

LEARNING TIPS

Contact Project Seagrass for any guidance on how and where to plant a seagrass meadow.

Be extra cautious whilst working at sea!

This 'Underwater gardener' guide can be used in partnership with the Project Seagrass activities: '**Marine restoration**', '**Plant biology**' (anatomy, photosynthesis and reproduction), '**Stakeholder roleplay**' for seagrass restoration, '**Coastal protection**', '**Water filtration**' and '**Hide & seek**'.

KEY INFORMATION

- Outdoor activity (at a seagrass meadow)
- Group activity
- Time – 2/3 hours for two consecutive days (at low tide)
- Practical

KEY WORDS

Intertidal Zone–

Area on the beach, covered by high tide but exposed at low tide.

Spathe –

The part of the seagrass plant containing seeds, like a seed pod.



FUN FACT!

Up to 92% of the UK's seagrass meadows have been lost in just the last century



INTRODUCTION

Seagrass Seed Collection - *Walking & Snorkelling*

Ever wanted to be an underwater gardener? Well today is your time to shine! Check out this video: https://www.youtube.com/watch?v=fC1QxOBkx-g&ab_channel=RAZORScienceShow, on how Seagrass Ocean Rescue did it, so you know what to expect!

Seagrasses are marine flowering plants, living in shallow and sheltered coastlines. They can grow up to 10 meters deep in the UK but are often found in the **intertidal** (where the beach is exposed when the tide goes out). Seagrasses are very different to seaweeds. Their bright green leaves form underwater meadows, which are key for our **fisheries**, are an important **carbon store** and provide us with **coastal protection**.



Head to Project Seagrass' YouTube channel for some videos in seagrass meadows, so you know what it will look like underwater! It feels just like grass in your garden.

The seeds are at the top of a special leaf called a '**spathe**'; they look like tiny peas in a pod. The easiest way to spot them is looking for strands that are a yellow/green colour, and are skinnier, more like string (cylindrical) and tend to be taller than the flat leaves. The seeds once matured and ready to pick, are small ovals a couple of millimetres in size, squeezed in a line with about 10 others.



Seagrass anatomy and cut point for seed collection:

1



Identify seed spathe

2

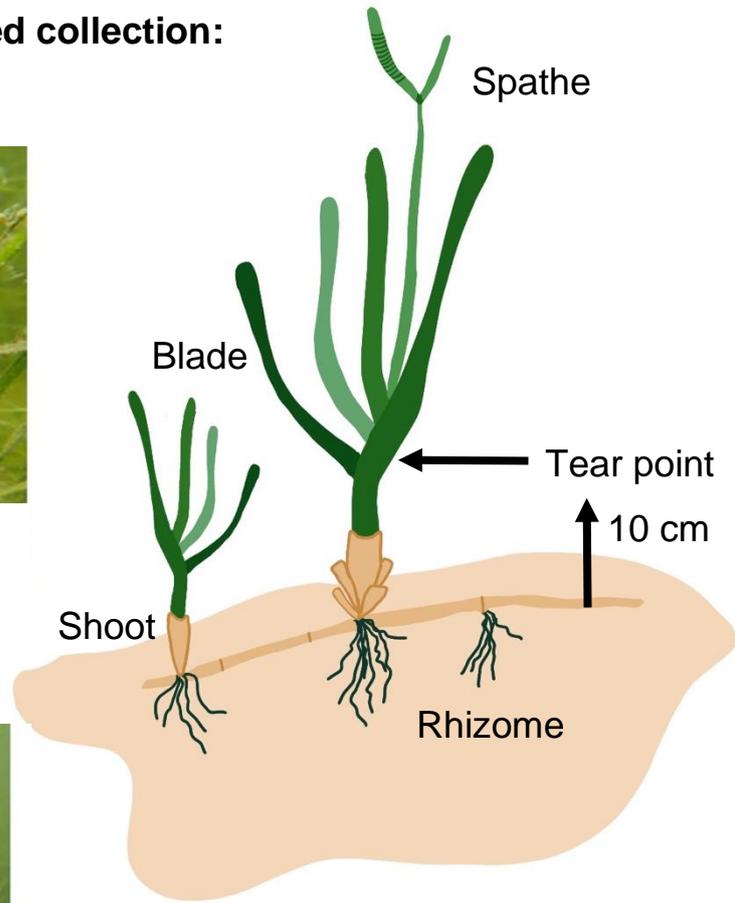


Pick gently from 10cm above the shoot

3



Add seeds to mesh bag and repeat!



The seagrass likes to grow in sheltered bays with a soft sediment like sand or mud. The easiest way to find somewhere suitable to plant seeds is to plant next to existing seagrass. When the seeds naturally drop from the plant, most are washed away to sea, where they won't be able to grow. By putting the seeds in biodegradable hessian bags, they stay near the meadow allowing it to expand much quicker, boosting the fantastic habitat. It also stops crabs from eating the seeds!

The hessian bags will need half filling with sand from the beach in which the seeds will be planted. Seeds are then added, and the bags are filled to the top with more sand. Adding the sand gives the seeds something for the roots to grow into (like soil for plants on land). The weight of the sand will also help keep the seeds in place. The sand won't be enough to stop the seeds being carried away with tide, so the bags need to be pinned to the seabed using bamboo stakes or tied to ropes that are weighed down by larger sandbags.



ACTIVITY:

Always ensure calm sea conditions and full knowledge of currents and tides in the area. If you feel uncertain whether conditions are safe, then do not enter the water and keep the class to intertidal picking. Low tide is also recommended for the snorkelling work to reduce the need to duck dive.

- Ensure site appropriate permits are in place including landowner permission.
- Two days will be needed to complete this seagrass planting activity as it relies on low tides (preferably when its light).
- Before going onto the beach, everyone should be provided with a thorough health and safety briefing on the shore, as well as how to identify and pick seeds. A laminated picture of seagrass seeds may be helpful for correct ID.
- Emphasise that the quality rather than quantity of seeds is key! Immature ones will not develop into new plants.

YOU WILL NEED:

Contact Project Seagrass prior to the activity for help with permits, planning and gear.

Snorkelling gear including mask, snorkel, wetsuit as a minimum (Extras surface marker buoys, fins, booties, gloves and hoods).

Wellies, waders or wetsuit booties for intertidal collectors.

Towels and warm clothes to change into.

First aid kit (see snorkelling and intertidal health and safety guide).

Mesh collection bag.

Scissors or dive knife (optional).

Sealable storage box.

Hessian bags.

Buckets.

Bamboo stakes (minimum size of 15 cm) or biodegradable twine.



HEALTH AND SAFETY

Follow intertidal and snorkelling guidelines and complete risk assessment.

Do not consume seeds or sand.

Take care with the bamboo stakes not to spike yourself.

Follow the coastal tips guide for planning your intertidal or snorkelling seed collection.



Day 1 – Seed collection

- 1) If snorkelling, attach your mesh bag to your wet suit or around your wrist to stop it floating away. Likewise, attach your surface marker buoy if you are using one.
- 2) Try to find a patch of bare seabed, that is in arms reach whilst floating on the surface. Timing your snorkel with the low tide will make this much easier! (Duck diving can be tried if the staff feel confident to supervise this).
- 3) Pick every third mature seagrass seeding shoots, then add to your mesh bag. This reduces the risk of over picking a site.
- 4) Mature seeding shoots are those where the seed has become rounded and fully formed rather than green and pointy. Each seed spathe may contain up to 20 seeds. Some shoots will have multiple branches of spathes, meaning multiple spathes can be picked in one go.
- 5) Pick the shoot of a seeding plant 10 cm above the seabed. To do this, pinch below the picking point to stop any damage to the rest of the plant and tear at the picking point. **Do not pull up**, only gentle tearing! You may find it easier to do this by using scissors.
- 6) The process is the same whether you are walking on an exposed meadow or snorkelling.
- 7) Keep the seed shoots in the mesh bag throughout the collection.
- 8) On the beach it is time to snip the seed pods as short as possible. Cut above and below the spathe so just the seed pod is left.
- 9) Transfer the trimmed seeds to watertight boxes filled with local sea water. Lunch boxes work well!
- 10) Keep the boxes in a in a cool place, out of direct sun light.



Day 2 – Planting

- 1) Head to the beach a couple of hours before low tide.
- 2) Set up a bag filling station with empty hessian bags, sand scoops (or hands) and a bucket filled with seawater to use as a dunk tank.
- 3) Fill each of the hessian bags about halfway with dry sand.
- 4) Add 4-5 of the trimmed spathes, from the previous day, into the bag, then top the bag up with sand and tie the drawstrings firmly shut.
- 5) Once filled put the bags straight in the dunk tank to keep the seeds wet.
- 6) Once the tide is at its lowest point it is time to plant the bags! This can be done in one of two ways:

Planting method 1:

- 1) Wade out on a low tide, to about hip height, where there is a gap of bare sand or mud, in or next to a seagrass meadow.
- 2) Planting should take place in threes: (these roles can be rotated).
 - a. Person one to carry the bags.
 - b. Person two to pierces the hessian bag so that the bamboo stake comes through to the other side of the bag. Take care not to stab yourself!
 - c. Person three is responsible for planting. Holding the top of the stake, push the bag into the sediment as far as possible. If the water is clear enough, dig a small hole in the sand for the bag to sit in before pushing the stake into the ground.



Planting method 2:

- 1) After a good soak the bags are ready to be tied onto twine.
- 2) Get everyone into one big line, spaced roughly a meter apart and then feed the twine out along the line. Leave an extra 2m of twine at either end.
- 3) Each participant now ties a seed filled bag on to the twine at their meter mark. To do this pinch the twine creating a 3 cm loop. Put the loop through one of the bags drawstrings and tie a double knot.
- 4) Repeat this until you have around 30 bags on a line (cut the twine with 2m spare from the last bag).

- 5) Tie a large hessian bag filled with more sand from the beach on to each end of the line. These need to be a minimum of 7kg to hold the line in place whilst the seeds grow!
- 6) Once it is nearly low tide then it's time to plant! Have someone on either end supporting the large sandbags, and a couple of people to support the small seeded bags. Wade straight out until chest height, get the line taught and drop it to the seabed.
 - a. If conditions allow get an adult to take the large sandbag at each end of the line, then have the children support the seed bags. Walk out together in a big line until you reach the planting spot!
 - b. If getting the children in the water isn't suitable then the line with the bags can be fed into a large plastic box or tub, taken to the water's edge and fed out slowly by hand whilst walking. Remember to tie a large sandbag on each end!
- 7) Incredible, you've planted a whole new part of a seagrass meadow and helped create a home for so much wildlife! Please send Project Seagrass pictures so we can shout about your amazing achievement!



- Upload any seagrass snaps to our spotter app! <https://seagrassspotter.org/>
- How to plant a seagrass meadow. <https://www.seawilding.org/how-to-videos>
- Information about Seagrass Ocean Rescue. <https://www.projectseagrass.org/seagrass-ocean-rescue/>
- Seagrass videos. <https://www.youtube.com/channel/UCGSHPIN3rgaE04a0bgzCYjw>