How can we save super seagrass?

SEND

Sarah Banks and Dr Andrew Folkard

Sandside Lodge School, Ulverston

Specialist knowledge for teachers

Seagrasses are a unique form of coastal vegetation, in that they are the only rooted plants that can grow when fully submerged by salt water. This means they are different from saltmarsh plants or mangroves, which have to have part of their bodies, or spend part of the time, above water. They are also different from things like seaweeds, kelp or corals, which do not have roots and just attach themselves to rocks. These unique characteristics, of being rooted, able to grow fully-submerged by water and able to survive in salt water, mean that seagrasses form dense 'meadows' that can extend all the way from the intertidal zone (where they are able to survive drying out as the tide recedes) out to the point where sunlight no longer reaches the seabed (because they need to photosynthesize). In clear water, this can be up to tens of metres deep.

Seagrass meadows perform many vital functions because of their uniqueness. Physically, their roots stabilise the seabed, and their leaves dissipate wave energy. So, they are extremely effective as a defence against coastal erosion. Chemically, they are excellent oxygenators of the water, making it healthier for respiring fauna such as fish. They also punch above their weight in terms of sequestering carbon, taking it out of the atmosphere (reducing the greenhouse effect) and burying it in thick layers of roots and dead plants that build up in the seabed beneath them. Biologically, they are excellent places to feed, raise young, hunt, hide or just mooch about for all sorts of organisms, from worms and snails that live on the leaves, to seahorses, many species of fish, up to charismatic megafauna such as manatees, dolphins, sharks, octopuses and turtles.

There are approximately 60-70 species of seagrass – exactly how many is still a topic of research.

They are very old: they first came into being around 120 million years ago, during the Cretaceous Period, so are nearly twice as old as Tyrannosaurus Rex! Partly because of the movement of tectonic plates over that long time, they are very widespread. They are found as far apart as New Zealand and Iceland, and at all longitudes around the Earth. They are more common and more species-rich in the tropics but are also found abundantly in temperate regions.

Like many coastal marine species, a combination of sea level rise and coastal erosion, construction and pollution means that seagrass meadows are in decline across the world. This is exacerbated by a wasting disease that specifically affects seagrass, particularly the genus Zostera, which is commonly found in the North Atlantic Ocean. The combination of seagrasses' importance, uniqueness and decline means that it is vital to work to conserve and expand existing meadows and to educate everyone about their value.

Around the UK, seagrasses are found in many places. They are particularly abundant along the south coast of England, but are also found in many other places, including Morecambe Bay, where healthy seagrass communities grow in places like the Walney Channel. The meadows here are made up of two species: Zostera marina (eelgrass) and Zostera noltii (dwarf eelgrass). They are partly sub-tidal but partly inter-tidal, so you can go and see them, especially during the summer, if you walk approximately north from Roa Island up the coastline, or east from the southern end of Walney Island. If you do this, remember to wear waterproof clothing, wellies (which will get very muddy) and follow the golden rule of only ever going into the intertidal zone when the tide is going out!

Curriculum aims and objectives

This Super Seagrass topic aims to give experiences and teach children about conservation in their local environment, encouraging them to ask questions about what they can do to help an environmental issue. The resources include lots of sensory activities that can be adapted easily for any class. They will create a structure that can be used to encourage more sea grass to grow! Then take the structure and place it in the coastal area.

Although it is specifically written for UKS2, this would suit KS3/4 SEND pupils too. Primarily geography-focused, this project has lots of elements of science and PSHE.

Prior knowledge: The children have some knowledge of beaches and items that belong there.

Using Wilson Smith P levels, this project covers the full range of P levels in the curriculum areas specified, working up from P4.

NC – Geography: Pupils should develop knowledge about their locality and use basic geographical vocabulary to refer to key physical features, including: beach, cliff, coast, forest, hill, mountain, sea, ocean, river, soil, valley, vegetation, season and weather

NC – Science: Pupils should be able to identify and name a variety of plants and animals in their habitats. Science enquiry - to ask simple questions and recognise that they can be answered in different ways. To be able to observe closely and use simple equipment.

Other topics include PSHE and Sustainability and climate change; what contributes to climate change and how we can help tackle this.

Head

This topic enriches children's vocabulary, learning what causes harm to the environment. Positively thinking: 'What can we do about it?'.

Heart

Pupils learn in a sensory way enabling the children to gain a wider understanding of the coastal area. Building a connection to the local coastal area, questioning and connecting positively: 'How do we feel about it?'.

Hands

Pupils use their hands in the sensory sessions to give the children more understanding and a sensory experience. Using hands to create devices, do other activities to help the environment. Learning outside – visiting coastal areas.

Ultimately pupils will show an understanding of ways that we harm a specific area of our world and create a device to support this environmental issue.

Examples in practice

Sensory Story Plan: Peter Plaice and the Sea Grass that Needs Saving

Summary: Peter Plaice is a young fish and is growing up in the Barrow estuary area. Peter and his other fishy friends decide to go exploring and they come across things that you wouldn't normally see in the water, and they don't know what they are… e.g. a bike with a wonky wheel, a tyre, a broken umbrella lots and lots of plastic bottles. The water began to look dirty (use hidden item and revealed to show some of the items). Where would they normally be used?

When Peter Plaice and his friends got back to their 'home' area something looked different… Compare original picture with new one of much less sea grass. Can the children spot the differences?

Peter Plaice began to feel ill and he had nowhere to hide because the sea grass was disappearing. Why was it disappearing and what can be done about it?

At the end… There are some children from Sandside Lodge School who are learning about sea grass and how it helps the environment. They have an idea on how to help!

Background information: Seagrass is an underwater flowering plant. It is the only marine flowering plant able to survive and pollinate fully submerged. Once found widespread across the UK, our seagrass beds have declined by over 40% since the 1930s. This is mainly due to coastal development, pollution and wasting disease, as well as physical disturbance.

Seagrass form beds, or meadows, in shallow coastal areas (intertidal and subtidal regions) where they receive plenty of light. They also prefer sheltered bays and lagoons protected from significant wave action.

Fish begin life as eggs, also called roe. Once the eggs hatch, the young fish initially rely on a yolk sac for nutrition and are referred to as alevins or sac fry. During this stage, they remain mostly hidden and immobile – in plants like seagrass, absorbing nutrients from the yolk sac until they are ready to feed independently.

Info on seagrass - **https://www. gov. uk/government/publications/seagrass-protection-and-recovery**

Adaptations to extend impact

This project can be adapted to anywhere in a SEND school KS2 and upwards and could be used in other coastal regions with similar seagrass meadows.

It could be developed to a higher level in terms of what causes the pollution and what else they can do about it via debate and research.

It could be adapted to think about types of creatures/plants that live in the sea, or change/extend the task of making a sea grass support – looking at what shouldn't be in the sea or on our beaches.