Seafood in Schools – Sustainability
Teacher Notes

Aim: The focus of this lesson will be on sustainability in the Scottish seafood industry, introducing the idea of fish by-products and the methods that are put in place by the industry to ensure Scottish seafood has a long future. This will also look at how we can reduce fish waste by making the best and informed choices when adding seafood to our diet.

Curriculum Links (Mapping)
CfE *HWB 3-29a*: I can explain the importance of eating a variety of foods, and the role of different food groups in keeping me healthy. *HWB 3-34a*: I can explore the factors that affect food choices and suggest ways to overcome barriers to making healthy eating choices. *HWB 4-29a*: I can analyse how my food choices impact my physical, mental, and social well-being, and can make informed decisions based on my findings *HWB 4-34a*: I can critically assess the factors that influence my food choices, and develop strategies to make healthier choices. Interdisciplinary Links – if using the lesson plan wider than Home Economics lessons: *SCN 3-05a*: I can explain how human activities can affect the sustainability of natural resources. *SOC 3-18a*: I can explain how people in Scotland contribute to the economy, and identify key industries such as farming, fishing, and tourism. *SOC 3-17a*: I can describe the importance of Scotland's natural resources and how they contribute to the global economy. *TCH 3-09a*: I can investigate a range of technologies used to develop sustainable practices in industries such as agriculture, food production, and aquaculture. *SCN 4-07a*: I can investigate the impact of human activity on biodiversity and ecosystems and suggest ways to manage these impacts. *TCH 4-09a*: I can evaluate the sustainability of different technologies used in food production, including aquaculture and fisheries.

SOC 4-18a: I can describe how Scotland's industries contribute to the national and global economy, and explain the factors that influence them.	
Learning Intentions Young people will: • understand the concept of sustainability in the seafood industry: learn about the practices used in the Scottish seafood industry to ensure sustainability and the long-term health of fish stocks. • learn about methods for reducing seafood waste: recognise the importance of making informed choices when consuming seafood to minimise waste, and how these choices contribute to sustainability. • reflect on the future of the Scottish seafood industry: understand how sustainable practices in fishing and aquaculture ensure that Scottish seafood remains available for future generations.	**Success Criteria** Young people will be able to: • explain the importance of sustainability in the seafood industry. • discuss methods for reducing seafood waste and explain why this is important for sustainability. • make informed choices about seafood and reflect on personal food choices • explain how sustainable practices contribute to the Scottish seafood industry and its future.

	Description	**Resources**	**Time**
1.	**Introduction – Seafood for a Sustainable Future** As we explore the world of seafood, it's important to recognise that the choices we make in the foods we eat can have a big impact on the environment. Sustainable seafood refers to fish and shellfish that are caught or farmed in ways that maintain fish populations, protect marine ecosystems, and ensure that seafood remains available for future generations.	*Sustainability* Presentation Slide 2	

	Scottish seafood is known for its commitment to sustainability, with strict regulations and practices that prioritise environmental health. By choosing Scottish seafood, we're not only supporting local economies but also contributing to the protection of our oceans and the long-term health of marine life. Let's dive into how sustainable fishing practices work and why they matter for the future of our planet.		

2.	**Discuss – Protecting Our Seas**
	Sustainability in Scottish Seafood – discuss with learners that when we eat seafood, it's important to think about where it comes from and how it's caught. Sustainable seafood practices ensure that marine life is protected for future generations, and this is something Scotland takes seriously.
	• Wild-Caught Seafood from Sustainable Fisheries
	  ○ 79% of wild-caught seafood comes from sustainably managed fisheries. This means that the fish we consume are harvested in ways that maintain healthy fish populations and ensure the health of marine ecosystems. These fisheries follow strict regulations to avoid overfishing and protect biodiversity.
	  ○ A range of fishing gears are used in commercial fishing. Every type of gear has some effect on the ocean environment however, if carefully managed, virtually all gear types can be used responsibly and sustainably.
	• Marine Protected Areas (MPAs)
	  ○ 37% of Scotland's seas are designated as Marine Protected Areas (MPAs). These are areas where human activities, like fishing or pollution, are regulated to protect important marine habitats and species. MPAs help ecosystems thrive, so fish populations can recover and grow.
	• High-Quality Coastal Waters
	  ○ In 2024, the Scottish Environment Protection Agency (SEPA) classified 98% of Scotland's coastal waters as high-quality
		Sustainability Presentation Slide 3
		
		Our Seas, Our Future – Management & Regulation https://seafoodscotland.org/our-seas-our-future/management-regulation/
		
		MSC – Fishing Methods & Gear Types https://www.msc.org/what-we-are-doing/our-approach/fishing-methods-and-gear-types
		
		Marine Protected Areas – Scottish Government https://www.gov.scot/policies/marine-environment/marine-protected-areas/	

	status. This reflects the health of Scotland's marine environment, demonstrating effective management practices that keep the waters clean and support the sustainability of local fisheries. • Fishing Quotas: ○ Governments set and agree quotas, which limit the species, amount and size of fish that can be caught – this helps prevent overfishing, protects vulnerable species, supports balanced ecosystems, and ensures the long-term health of fish populations. To engage the class, you can ask the following questions to encourage discussion and critical thinking: • Why is it important for seafood to come from sustainably managed fisheries? • What do you think happens to fish populations if fisheries aren't managed sustainably? • How do Marine Protected Areas (MPAs) help in protecting marine life? • Why do you think it's important that 98% of Scotland's coastal waters are classified as high quality?		
3.	**Discussion – Reducing the carbon footprint** Helping learners to understand the positive environmental impact of seafood choices, with a focus on the carbon footprint of farmed seafood, shellfish farming, and seaweed farming. • Lower Carbon Emissions: Seafood, particularly farmed fish, generally has a much lower carbon footprint than other farmed animal proteins [*see slide for related figures*]. Fish are more efficient at converting feed into protein. They require less energy, water, and land than terrestrial animals, which makes them a more sustainable protein choice.	*Sustainability* Presentation Slide 4	

	• Environmental Benefits of Shellfish Farming: Shellfish farming (e.g., mussels, oysters, scallops) is one of the most environmentally friendly forms of aquaculture. These species are filter feeders, meaning they clean the water as they grow, improving water quality around them. Shellfish do not require additional feed, as they naturally filter plankton and nutrients from the water, and shellfish farms create habitats for marine life, improving biodiversity and promoting the health of coastal ecosystems. The Scottish shellfish farming sector is worth an estimated £37million at first sale value. • Seaweed Farming and Carbon Sequestration: Seaweed farming is incredibly beneficial for the environment, as seaweed absorbs large amounts of CO_2 from the atmosphere during its growth. In fact, seaweed can absorb more CO_2 than land-based plants per hectare. Seaweed farming does not require freshwater, land, or fertilisers, making it a highly sustainable method of production. Additionally, it helps reduce ocean acidification and provides a habitat for marine life. Additional Tips for Delivery: • interactive activities: have learners research or discuss how sustainable seafood choices can be part of a larger strategy to tackle climate change. • relate to local impact: in areas with active shellfish and seaweed farming, highlight how these practices benefit local ecosystems and economies.		
4.	**Discussion – Fighting Waste** Help students understand the importance of reducing seafood waste by exploring fish by-products, recycling fishing waste, and eating a variety of species. This section also covers practical tips for reducing waste in household cooking.	*Sustainability* Presentation Slide 5 Fishing for Litter scheme https://fishingforlitter.org/	

	• Fish by-products are parts of the fish that are often not eaten, such as fish skins, bones, heads, and off-cuts. These parts were traditionally considered waste but are now being innovatively used in various food products and supplements.
	• Fish Waste can be used in various ways such as being recycled into natural fertilisers, helping to nourish crops while reducing chemical fertiliser. In some cases, fish waste can be converted into biofuels, reducing the reliance on fossil fuels and contributing to renewable energy sources.
	• Fishing & litter: some fishing communities partner with organisations that specialise in recycling fishing gear and waste materials. Old nets, ropes, and other fishing waste are being repurposed into products like clothing, bags, and building materials. The *Fishing for Litter* initiative encourages fishermen to collect waste, particularly plastics, from the sea while out fishing. They then bring the waste back to shore for proper disposal or recycling. This helps to reduce ocean pollution and raises awareness about the environmental impact of plastic waste.
	• Many people consume a limited range of fish species, such as cod, salmon, and tuna. Overfishing of these species can lead to depletion of stocks. By choosing a wider variety of fish, such as sardines, mackerel, or pollock, we can help alleviate the pressure on overfished species.
	• Practical tips for reducing seafood waste at home:
	  ○ Use all parts for the fish - use the fish bones to make homemade stocks or broths. This is an easy way to make use of parts that would otherwise be thrown away.
	  ○ Repurpose leftovers - leftover fish can be used in fish cakes, salads, or pasta dishes. This helps ensure that no food goes to waste.		

	○ Storage tips - properly store fish in the fridge or freezer to extend its shelf life and reduce spoilage. Freezing fish is an excellent way to preserve it for later use. ○ Choose smaller portions - by cooking smaller portions of seafood, you can avoid excess waste from uneaten food, while still enjoying a variety of dishes. Additional Tips for Delivery: Interactive activities: encourage learners to brainstorm and share ways they can reduce seafood waste at home or ask them to research innovative fish waste recycling projects around the world. Relate to local impact: if possible, highlight any local or regional initiatives that aim to reduce seafood or general food waste.		
5.	**Activity – Cooking Session** This cooking and tasting session offers learners the opportunity to get hands-on with preparing delicious dishes using sustainable fish while also learning valuable techniques for reducing food waste. By working with fresh, sustainable Scottish seafood, learners will not only discover how easy and tasty it can be to include fish in their meals but also understand how their food choices can positively impact the environment. During the session, pupils will explore how to prepare and cook a variety of seafood dishes, focusing on utilising portions of fish to minimise waste. They will gain practical experience in cooking different types of seafood and learn how to make the most of fish by incorporating into economical family meals. By exploring new types of seafood and embracing the idea of reducing waste, students will gain a deeper appreciation for the diversity of fish and how to incorporate them into a sustainable, healthy diet.	*Recipe Cards*	
6.	**Discussion – How Can You Help?**	*Sustainability* Presentation Slide 6	

	Sustainable seafood has a lower environmental impact, and making informed choices can help reduce overfishing and preserve biodiversity in our oceans. • Accreditations: sustainability certifications are designed to ensure that seafood is sourced from responsibly managed fisheries or aquaculture operations. These certifications help consumers make choices that support the long-term health of marine ecosystems, fair labour practices, and sustainable fishing methods. The MSC Blue Label is perhaps the most widely recognised certification for wild-caught seafood. • By choosing lesser-known but equally nutritious fish, such as sardines, coley, pollock, and hake, we can help reduce pressure on overfished species. Many of these lesser-known fish are still abundant, often with lower carbon footprints and more sustainable fishing practices. Eating a wider variety of species encourages diversity in the fishing industry and ensures a more sustainable seafood market. • Scotland has made significant efforts to promote sustainable seafood, such as implementing Marine Protected Areas, regulating fishing quotas, and supporting local sustainable fisheries. Scotland is known for its commitment to protecting the marine environment and providing high-quality, responsibly sourced seafood. By becoming informed consumers, we can all contribute to preserving marine life and ensuring future generations can enjoy seafood. Here are some questions to help with discussions: • Why do you think it's important to eat seafood that is certified as sustainable? • How can eating a variety of fish, beyond the 'top 5', help reduce overfishing?	Our Seas, Our Future - Accreditation https://seafoodscotland.org/our-seas-our-future/accreditation/	

	• What can you do to make more sustainable choices when buying seafood in your local supermarket or restaurant? • How can we encourage others to make informed choices about sustainable fish? • What are some benefits of supporting local Scottish fisheries and sustainable seafood practices?		
7.	**Activity – Reflect on your learning from the presentation** Using the worksheet, pupils should answer the questions drawn from information provided in the presentation – this will include	*Worksheet – Sustainability*	

Additional Resources

Seafood Scotland can support with seafood products to use in your lesson – please contact enquiries@seafoodscotland.org to discuss availability in your area.

The full range of Seafood in Schools recipe cards across different species are available on the Seafood in Schools webpage for download.

Appendix

Additional Links

Good Fish Guide (Marine Conservation Society): https://www.mcsuk.org/goodfishguide/

BBC Article on the 'Big Five' species eaten in the UK: https://www.bbc.co.uk/food/articles/five_types_fish

Sustainable Seafood Swaps (Marine Conservation Society): https://www.mcsuk.org/ocean-emergency/sustainable-seafood/seafood-buying-guides/5-sustainable-seafood-swaps/