

Lesson Plan 2: EXPLORERS MARINE SPATIAL PLANNING – THE PEOPLE & HOW WE USE THE OCEAN

Subject: Cross curricular – Science, Geography, Language

Class: 10-12 years

Time: Approx 120 min

Materials & Resources:

- PowerPoint Presentation: Marine Spatial Planning – Our Ocean Our Future
- Large map of Ireland – showing the boundaries of Ireland's National Marine Planning Framework area (on screen). A physical map may be provided as part of the Explorers outreach programme visiting the class.
- Pictures of marine activities laminated: fishing boats, cargo ships, wind farms, cruise ships, divers, marine animals, marine recreational beaches, and research vessels.
- Marine Spatial Planning Information sheets (booklet)
- Teachers Guide – New Words and Vocabulary for children
- [Explorers Marine Spatial Planning Interactive Map](https://ie-marine.maps.arcgis.com/apps/instant/atlas/index.html?appid=7ed7215587424aae89068bc61748fd06&webmap=b7ea84b3d7154322995e7981fcf3cd40) – Are you ready for an adventure! : <https://ie-marine.maps.arcgis.com/apps/instant/atlas/index.html?appid=7ed7215587424aae89068bc61748fd06&webmap=b7ea84b3d7154322995e7981fcf3cd40>

Other materials for the class:

- Children's workbook to take notes.
- Construction paper or large sheets of paper
- Markers, crayons, coloured pencils, Scissors (optional, for cutting out activity pictures), Glue or tape.

AIM: This lesson is divided into three parts. Firstly, children will develop their understanding of how we are all interconnected to the ocean through our economy, our environment, and our social connections. Secondly, the children will develop their digital skills learning and developing their own map packs highlighting the different marine activities and how we use the ocean. The children will identify the areas and challenges of using the same marine spaces. Finally, the children will plan creating their own Designated Maritime Area Planning Maps (DMaps) and develop an understanding of the benefits of marine spatial planning.

OBJECTIVES:

1. Learn about how we are interconnected to the ocean through our jobs, the environment, & our social connections.
2. Develop digital skills learning to use the Explorers Digital Marine Spatial Planning Map and investigate the questions relating to marine activities.
3. Learn about DMaps and the benefits of marine spatial planning.

LESSON PLAN PROCEDURES:

Class Discussion / Presentation / Activities:

Part 1: MARINE SPATIAL PLANNING – IDENTIFYING THE USERS OF THE OCEAN USING THE REAL MAP IRELAND & IMAGES

- Using the Power Point Presentation discuss with the students the different types of ways we use the ocean. Discuss how the different users can be put into different categories: Economy, Environment, and Social Connections.
- Identify and discuss who each of the stakeholders are: Marine stakeholders are not just one group of people.
- Explain a 'marine stakeholder' is anyone who has a strong interest or a direct connection to the ocean and its resources. They are the people who care about what happens in the sea because they are either a part of it, live near it, or depend on it for their jobs or way of life.
- Use the slide show and images provided and create an interactive game where the children can place the images on a physical map identifying where they think they should be placed. Some examples include:
 - **Economy:**
 - **Fishers:** Their livelihood depends on a healthy ocean. They want to make sure there are enough fish for them to catch now and in the future.
 - **Companies:** Businesses that use the ocean, like shipping companies, cruise lines, or companies that want to build offshore wind farms.
 - **Environment:**
 - **Scientists:** They study the ocean's wildlife and ecosystems. Their goal is to understand how the ocean works, how to protect it, and how we can use it in a sustainable way.
 - **Conservationists:** These people work to protect marine animals and their habitats. They want to create **Marine Protected Areas** and stop pollution.
 - **Social Connections:**
 - **Coastal communities:** People who live along the coast and whose culture, tourism, or local economy is connected to the sea.
 - **Government agencies:** The people who create and enforce the rules for the ocean, like the ones in the **National Marine Planning Framework**.

Class Discussion / Presentation / Activities:

Part 2: THE MARINE SPATIAL PLANNING – DIGITAL MAP ACTIVITY

[Class Discussion / Activities]

- Using the [Explorers Marine Spatial Planning Digital Map](#) have students complete the digital mapping activity either in teams or individually (depending on access to computers). Using the different map layers (marine activities listed below) and the Mapping Activity information sheets, they should answer the questions and examine the marine activities at each layer.

1. Ports of Ireland: Regional Port National – Tier 1 National – Tier 2	5. Offshore Wind Energy
2. Boundaries National Marine Planning Framework Area 12 NM Territorial Sea Limit	6. Marine Transport Marine Ships Cargo Ships Passenger Ferries Other vessels
3. Ocean Depth	7. Recreation Blue Flag Beaches Surf School Businesses Marina's
4. Seafood Fishing Ports Fishing Activity Fishing Grounds Aquaculture Site	8. Conservation Special Protection Areas – Birds Special Area of Conservation

- All the marine activities can be viewed on the map in the layers. Encourage the students to investigate the map under each of the eight headings (layers) and create a digital file of each map for their own map packs. Once they have completed their maps, get the students to create a map with all of the layers added.
- Examine the map layers. Students should create maps of their own coastal area and get them to mark on the digital map where marine activities occur:
 - Look at how many marine activities there are by layering them on the map.
 - Think about why some activities happen in specific areas.
 - Are different activities overlapping?
 - What does the map look like — busy, crowded or messy?
 - Can you find a spot for a future offshore wind farm?

- Discussion points and questions / answers for each map theme. Get the children to complete the Marine Spatial Planning Worksheet as they are exploring the map layers. The Activity Information Sheets and the Storybook may be used for more information for the children to source]:

1. PORTS OF IRELAND

General Information

A port is a harbour or area where ships can safely load and unload cargo and passengers. Some ports are represented by larger symbols than others to show that they handle more "tonnage," which is a way of measuring the weight of the cargo that goes through them.

Port Tiers

- Tier 1 ports are responsible for 15-20% of all national tonnage through Irish Ports: Dublin Port, Port of Cork, Shannon Foynes Port.
- Tier 2 ports are responsible for at least 2.5% of national tonnage: Rosslare, Waterford.
- Regional Ports are other ports of commercial importance: Bantry, Castletownbere, Killybegs, Drogheda, Galway, New Ross, etc.

Questions & Answers

- Why are towns and cities usually built near ports?
Answer: Towns and cities grew around ports because they were important centres for trade, travel, and jobs. The port makes it easy for businesses to get goods and for people to travel.

2. BOUNDARIES

General Information

The National Marine Planning Framework Area is the area covered by Ireland's Marine Spatial Plan, which is about seven times the size of our land! The 12 Nautical Mile (nm) Territorial Sea limit is the area that Ireland has complete control over, including the ocean, the seafloor, and the airspace above.

Questions & Answers

- How can we keep track of all the different activities in such a large area?
Answer: We use maps and modern technology to track all the different activities. Marine Spatial Planning (MSP) helps us organize everything so that different activities, like shipping and fishing, can coexist without getting in each other's way.

3. OCEAN DEPTH

General Information

0-80m depth contours show the shallower areas surrounding Ireland. It gets harder to build things on the seabed the deeper you go. Offshore contour lines show how deep the ocean is, just like contour lines on a map of the land show hills and valleys. These lines help us see the rise and fall of the seabed.

Questions & Answers

- Why is it important to know the depth of the ocean?

Answer:

- Fishing: You need to know how deep the seabed is so your net can reach the bottom.
 - Wind Turbines: Fixed-bottom wind turbines are built on the seafloor, and they can only be placed in shallower waters.
 - Habitats: Different animals and plants live at different ocean depths.
 - Safety: Ships need to know how deep the water is so they don't get stuck!
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- How deep does Ireland's ocean get?
 - Answer: Deeper than 3,000 meters (or 3 km)!

4. SEAFOOD

General Information

Different fish species are brought to different ports. A heatmap shows where vessels are fishing in Ireland's core fishing grounds, with the darkest purple areas showing the highest concentration of fishing vessels. Some areas of the sea are important spawning and nursery grounds for marine species, which is where fish lay their eggs and where young fish grow. Aquaculture is the farming of fish and other marine life in a controlled environment.

Questions & Answers

- Why are fish often brought to the nearest port?

Answer: To save time and money, and to keep the fish as fresh and high-quality as possible.

- Why might fish choose specific areas as spawning/nursery grounds?

Answer: They look for places with more food and less risk from predators.

- Why is it important to protect these areas?

Answer: It is important to protect these areas to give young fish a chance to grow, join the adult population, and reproduce themselves. If too many fish are caught before they reproduce, the population will decline.

5. OFFSHORE WIND

General Information

A map shows the locations of existing and planned wind farms in Ireland. The Offshore Wind Speed shows the average potential wind speed, which is higher further offshore and on the west coast compared to the east.

Questions & Answers

- What are the considerations when choosing a site for wind farms?

Answer:

- They need a suitable wind resource (a place with strong winds).
- They need a good seabed type and a shallow depth (less than 80 meters).
- They need to be close to large ports for building and maintenance.
- They need to be close to an available grid to send electricity to homes and businesses.

6. MARINE TRANSPORT

General Information

Vessel Density shows the routes most frequently used by ships and ferries.

Questions & Answers

- What is the difference between the cargo ship and passenger ferry density?

Answer: Cargo ship routes are more spread out, going to many different international destinations. Passenger ferries follow more direct, frequent routes between major ports.

- Where do most of the journeys originate from?

Answer: They start from the largest ports, like Dublin and Rosslare.

- Where might they be going?

Answer: They travel to destinations in France, England, and Wales.

7. RECREATION

General Information

Activities like visiting Blue Flag Beaches, Surf Schools, Marinas, and going Sailing show our connection to the sea. These activities all occur in coastal areas, close to land.

Questions & Answers

- Could other uses of the marine areas interfere with these?

Answer: Yes, large ships, wind farms, or fishing boats could interfere with areas used for swimming and sailing.

- Could these have a negative impact on marine areas?

Answer: Yes, litter, pollution from boats, and damage to natural habitats are all potential negative impacts.

8. CONSERVATION

General Information

Special Protected Areas-Birds are areas that protect birds, and they are mostly located very close to land. Special Areas of Conservation (SACs) protect important habitats and species.

Questions & Answers

- Why are Special Protected Areas for birds mostly close to land?

Answer: It is easier for scientists to monitor birds that are close to the coast. It is very difficult to consistently monitor birds far out at sea.

- Why are there so many SACs in coastal areas?

Answer: Endangered marine species and habitats are typically found in coastal, sheltered, shallow areas. These areas are also where most human activity occurs, so they face more pressure from pollution and fishing. Protecting them helps balance human needs with nature's needs.

Part 3: IDENTIFY THE AREAS AND CHALLENGES OF USING THE SAME MARINE SPACES

When Ocean Activities Collide!

[Class Discussion / Activities]

- The ocean is a busy place! Think about all the things happening: fishing boats, ships traveling to and from faraway places, wind farms making clean energy, and amazing marine animals like whales, dolphins, basking sharks, and cold-water corals.
- When lots of different things are happening in the same place, what might happen? (Guide the students towards answers "problems", "challenges", "conflicts").
- Ask the class to discuss in teams the challenges and how the different marine activities might be in conflict with each other or how some areas could work together.
- Have each group share one of their problem scenarios and their thoughts on it.

Part 4. INTRODUCING THE IDEA OF MARINE SPATIAL PLANNING (MSP)

[Discuss / Activities]

- How can we make sure everyone can use the ocean, but also keep it healthy and safe for all the amazing creatures that live there?
- This is where something clever comes in called **Marine Spatial Planning**.
Let us break down the words:
 - **Marine:** What does that mean? (Ocean!)
 - **Spatial:** This means 'about space' or 'about areas.'
 - **Planning:** What does planning mean? (Thinking ahead, making decisions, organizing).
- So, Marine Spatial Planning is like creating a *map* or a *plan* for the ocean, deciding where different activities should happen so they do not cause problems and so we can protect the ocean.
- It is about finding a **balance** between using the ocean for our needs and keeping it healthy for animals and future generations.
- Imagine you are organising a big playground in your school – you would not put the swings or the canteen for food right on top of the soccer field, would you? You would plan it out. You would have designated areas for different things – and have a plan for where everything goes.

Marine Spatial Planning: Design Your Own Ocean Map

Subject: Environmental Science, Geography, Social Studies

Grade Level: Primary/Middle School (Ages 9-13)

Learning Objectives

By the end of this lesson, students will be able to:

- Define Marine Spatial Planning (MSP) and its purpose.
- Identify various human activities that take place in the ocean.
- Recognize potential conflicts between different ocean users.
- Work collaboratively to create a sustainable marine plan.
- Articulate the environmental, economic, and social benefits of MSP.

Materials

- Large pieces of paper or construction paper for each group.
- Colored pencils or markers.
- Appendix A: Ocean Activity Cards (printed and cut out).
- Appendix B: Ocean Problem Cards (printed and cut out).
- Appendix C: Solution/MSP Cards (printed and cut out).
- Whiteboard or blackboard.

Lesson Procedure

Step 1: Introduction to Ocean Planning (10 minutes)

1. Begin with a discussion. Ask students to think about how they use a shared space like a playground or a sports field. "What happens if everyone wants to play a different game in the same spot at the same time?"
2. Introduce the concept of Marine Spatial Planning (MSP) as a way to manage our "shared ocean playground." Explain that it's a process of deciding where different activities—like fishing, shipping, and wind farms—should happen to keep the ocean healthy and prevent conflicts.
3. Explain that the Designated Maritime Area Plan (D-MAP) is a real-life example of this, focusing on specific areas for activities like offshore wind farms in Ireland.

Step 2: The Challenge: Design Your Own Ocean Map (15 minutes)

1. Divide the class into small groups and give each group a large piece of paper.
2. Instruct each group to draw a picture of Ireland in the center of their paper, imagining it's a portion of the ocean surrounding the country.
3. Explain their task: they are now Marine Spatial Planners, and their job is to decide where to place different activities on their "ocean."

Step 3: Planning & Problem Solving (20 minutes)

1. Provide each group with the Ocean Activity Cards (Appendix A).
2. Ask the groups to cut out the cards (or draw their own symbols) and place them on their maps. Encourage them to discuss their decisions as a group.
3. Circulate among the groups. Ask guiding questions:
 - "Where would you put a protected area for wildlife?"
 - "What would be a good place for fishing boats?"
 - "What if you put the protected area right next to a shipping lane? What might happen?"
4. Once they have placed their activity cards, introduce a challenge. Give each group an Ocean Problem Card (Appendix B).
5. Ask them to read the problem and find a way to rearrange the cards on their map to solve it. This is where they apply the principles of MSP.
6. Finally, provide the corresponding Solution/MSP Card (Appendix C) to show them how real-life MSP can help solve these complex problems.

Step 4: Share and Reflect: Our Ocean Plans (10 minutes)

1. Have each group briefly share their final "ocean plan" with the class.
2. Ask them to explain some of their decisions and how they resolved the problem on their card.
3. Encourage a discussion about their collaborative process. "Who did you have to think about when you were making your plan?" Guide them to consider fishermen, scientists, government officials, and local communities.

Step 5: Why It Matters: Benefits of MSP (10 minutes)

1. Bring the class together for a brainstorm session.
2. Ask, "Why do you think having a plan for the ocean would be a good idea? What are some of the benefits?"

3. Write their ideas on the board and guide the discussion to include the key benefits:
 - Reduce Conflicts: Fewer arguments over ocean space.
 - Protect the Environment: We can create special marine protected areas.
 - Support Economic Growth: Businesses like shipping and clean energy can grow in a smart way.
 - Improve Decision-Making: Everyone works together to make better choices.

Conclusion & Wrap-Up (5 minutes)

Remind students that MSP is a way to make smart decisions so our oceans stay healthy for everyone, now and in the future. It's up to all of us to help take care of the ocean, and MSP is an important tool for that.

Appendix A: Ocean Activity Cards

- Fishing Boat: (Picture of a fishing boat with nets)
- Cargo Ship: (Picture of a large cargo ship)
- Offshore Wind Farm: (Picture of offshore wind turbines)
- Cruise Ship: (Picture of a large cruise ship)
- Scuba Diver: (Picture of a person scuba diving)
- Whale/Dolphin Habitat: (Picture of a whale or dolphin)
- Coral Reef: (Picture of a colorful coral reef)
- Research Vessel: (Picture of a science research boat)
- Beach/Swimming Area: (Picture of people swimming at a beach)

Appendix B: Ocean Problem Cards

- Problem 1: A fishing boat is trying to catch fish in an area where a group of endangered sharks likes to feed. What could happen?
- Problem 2: A big cargo ship needs to get through a busy shipping lane, but there are lots of small recreational boats (kayaks, sailboats) in the way. What might happen?
- Problem 3: A company wants to build an offshore wind farm to make clean energy, but that area is also a very important place for a local aquaculture farm. How is this a problem?
- Problem 4: Divers love to go snorkeling around a beautiful marine bay, but the bay is also home to many rare and sensitive marine animals. How can too many people hurt the reef?

Appendix C: Solution/MSP Cards

- Solution 1: Through Marine Spatial Planning, a special "no-fishing" zone was created around the sharks' feeding grounds, keeping the wildlife safe while still allowing fishing in other areas.
- Solution 2: MSP helped create clear "shipping lanes" for big cargo ships and designated "recreational zones" for small boats, so everyone knows where they can safely go.
- Solution 3: With MSP, a solution was found where the wind farm and aquaculture farm could share the same space, with careful rules to protect both activities.

- Solution 4: Marine Spatial Planning led to the creation of a "marine protected area" around the sensitive bay, with rules about how many people can visit and what activities are allowed, to keep the ecosystem healthy.