

## Adventures at sea

1. **Underwater discoveries:** Getting to know sea animals
2. **Treasure hunting:** Photon on the hunt
3. **Sea or land:** Jump with us!
4. **Photon to the rescue:** We are counting on you...
5. **Sharing is caring:** Which islands got lucky?
6. **Robotic cruises:** Photon knows this sea like its own... edu mat
7. **Lines and angles:** How to measure them?
8. **Sea-Related terminology:** Foreign language practice
9. **A concert at sea:** Photon, we didn't know you can do that!
10. **Ahoy, weather!** In pursuit of sea storms





# 1. Underwater discoveries

## Goal:

- To understand marine ecosystems

## Required items:

- Information about marine animals present on the mat

## Activity:

Explain that the main goal of this activity is to program the robot to discover different sea animals by stopping at the fields on the mat where they are pictured. Students must correctly name them and learn key information about them.

While the students are getting information, the robot should have red ears, and when you are sure that the students are ready to answer all the questions, the robot should change its ears to green.

## List of animals presented on the mat:

- Fish:
  - Clownfish (Nemo),
  - Sailfish,
  - White shark,
  - Stingray,
  - Whale shark.
- Whales, orcas, and dolphins.
- Sea turtles.

- Seabirds:
  - Seagull,
  - Tern,
  - Puffin,
  - Thick-billed murre,
  - Pelican.

### Sample information:



#### Clown fish (just like the famous Nemo!)

Do you remember Nemo? Fish such as this one live in the ocean next to sea anemones. Anemones are sea corals (animals) with long arms (tentacles) and sting most fish, but are harmless for clownfish! For them, anemones make a safe home.



#### Sailfish

It is a fish with a large dorsal fin (known as the sail) and a characteristic long pointed beak (rostrum).  
NOTE! It can swim with speeds over 70 mph (110 km/h).



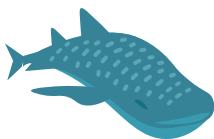
#### White shark

This is a large, well-known shark that is a very strong predator. It lives in many oceans and is one of the toughest water dwellers.



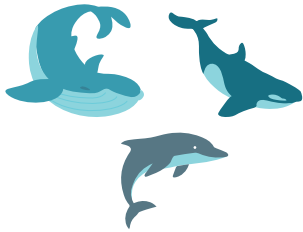
#### Stingray

It is a flat fish that hides in the sand at the bottom of the ocean. Interesting fact: This fish is a close relative of the shark!



#### Whale shark

It's interesting to know that whale sharks can cough! This way these fish cleans its filter apparatus. It also has the thickest skin of any animal in the world – it can be over 4 inches (10 cm) thick.



### Whales, orcas, and dolphins

Orcas, despite being large are in fact a type of dolphin! They are sometimes referred to as "killer whales." Whales are huge! The largest animal in the world is the blue whale. And the dolphins? They are very smart and love to learn new things.



### Sea turtles

These beautiful turtles can grow really big. Some weigh almost as much as a small car! They lay eggs on the beach. Baby turtles, as soon as they hatch, run to the sea.

### Seabirds:



**Seagull:** found over the sea and flying over beaches and harbours.



**Tern:** a slender bird with white feathers and a contrasting black cap on the head.



**Pelican:** has a large pouch-like beak to scoop up fish.



**Puffin:** has an orange beak and is a master diver. Scientists have discovered that puffins' beaks glow under ultraviolet (UV) light.



**Thick-billed murre:** it's a remarkable traveler! It travels thousands of miles between its summer and winter residences. On land, maintains an upright penguin-like posture.

## 2. Treasure hunting

### Goal:

- To develop problem-solving skills and logical thinking

### Required items:

- A story about a hidden treasure with encrypted information about the robot's route

### Activity:

Tell the children a story about a hidden treasure that includes information required to program the robot's path. The route should lead from the illustration of the pirate ship on the mat. The directions should be described using the points of the compass (cardinal directions).

In addition, give the children instructions with arrows indicating the number of moves of the robot or specific fields on the mat. The Photon Robot's goal is to find the treasure. The students, who have information about the route, program the robot accordingly.

### 3. Sea or land?

#### Goal:

- To develop programming skills
- To improve gross motor skills

#### Activity:

Ask your students to stand around the mat. Place the Photon Robot in the center of the mat. Start giving instructions to the children: You can say either "sea" or "land". The selected student takes over the tablet with the robot control interface and guides the Photon to the appropriate square on the mat representing Sea or Land. The rest of the children jump up to the nearest the area next to the map representing the Sea or Land (avoiding contact with the mat). The task is to follow instructions as quickly as possible.

For example: A boy takes control of the robot – the robot is positioned in the center of the mat. You give the command "land" – the boy programs/guides the Photon Robot in the direction of the land. The rest of the group jumps over to stand by the field with land on the mat. Who's faster?

The task ends when all the children had a chance to guide the robot.

## 4. Photon Robot to the rescue

### Goal:

- To learn and use the cardinal directions on maps

### Required items:

- A rescue mission letter with information about the route the robot must take to help. A sample letter can be seen below

*Dear Photon Robot*

*We need your help! There are regions on our map that require your intervention. You have to help all the stranded and provide them with the necessary supplies. Here are your instructions:*

- 1. Start your mission at the lighthouse.*
- 2. We agreed that you should visit the island closest to the lighthouse first. There are people who left some of their belongings in the city and they are waiting for your help. So visit the city first and then return the islanders their possessions.*
- 3. Return to the city on the coast. The people there lost their map some time ago and need your help finding it. As far as we know, the map was last seen aboard a pirate ship. Go to the sea and find it as soon as possible!*
- 4. Once you've recovered the map from the pirates and returned it to its owners, make your way to the coral reef. There, in one of the dark caves in the reef, careless divers got stuck and need ropes to get out. It looks like you will have to find them - you need to hurry!*
- 5. The last point of your mission is an island in the mid-western part of the map. Its residents have recently complained about the lack of supplies from the fishermen. I ask you on their behalf to deliver fish to their island. You can get fish from the boats working in the icy waters of the Ice Lands. It's quite a long crossing, but when you have to - you have to.*

*Fingers crossed! All the best.*

*The Rescue Team*

**Activity:**

Give the children the "Special rescue mission" letter you prepared. The rescue mission letter should specify the route the Photon Robot has to take.

Ask the children to program the robot, as it needs to follow the mission instructions closely and visit all the right places.

The four cardinal points are marked on the mat for children to use, but we suggest using a compass.

## 5. Sharing is caring

### Goal:

- To develop maths skills
- To help children understand the importance of sharing with others

### Activity:

Hand out the worksheets to the children and explain that their task is to guide the Photon Robot around the islands on the mat and determine which marine resources (such as fish and shells) belong to the nearest island. If the children agree that only one island should get all the resources around it, the Photon Robot's ears should turn red.

If the children agree that two or more islands can access these resources, the Photon Robot's ears should turn green. Then, they count and divide the resources equally among these islands. At the end of the task, the children should give the number and type of resources distributed to each island on the map.

## 6. Robotic cruises

### Goal:

- To develop presentation skills

### Activity:

Explain to the children that their task as a group is to prepare a story based on the objects shown on the map. The Photon Robot has to be the main character of the story.

You can start the class by specifying some other factors to include in their story, such as time and place. At the same time, you can leave everything to the students' imagination. Explain that the programmed route should be divided into 3 parts: introduction, main part, and conclusion. Mention that the robot can stop, change colour, respond to sounds or perform any other action.

Each team has to prepare a story and write it down. At the same time, the children program the robot to help them present their story. Writing the story and programming the robot could (but need not) be done interchangeably.

## 7. Lines and angles

### Goal:

- To improve math skills (calculating angles)
- To improve logical thinking skills

### Activity:

Point to the shoreline (angled lines) on the mat. Explain that the main task here is to measure the straight line angles of the shore - this will tell them the angles the Photon Robot must turn to travel along the line.

To make the activity more complex, ask the children to also measure the length of each piece of shore so that the robot can reach a particular point.

## 8. Sea-related terminology

### Goal:

- To improve active listening and speaking skills on a chosen topic

### Required items:

- Prepare short stories about the ocean /marine life (in a foreign language of your choice) featuring elements seen on the mat. A sample story with highlighted words is below.

*By the red and white **lighthouse**, the Photon Robot relaxed in peace, listening to the **birds**. All of a sudden, it saw something shiny on the **sand** where the **flock of birds** was getting ready to fly away. It was a bottle, and inside there was... a note?*

*Photon was curious to see what was inside. It took out the piece of paper and looked at it. The robot recognized the map. It was not just any map. It was the map of a **mysterious island** lost in time. As usual, the Photon Robot decided to set off for an adventure!*

*Photon looked at the **sea** and saw the distant shape of an island on the horizon – just like the one from the note. But the waters before the island, were full of hungry and scary **sharks**. After a while, the robot finally reached the island. Warm **sun** and palm trees swaying in the wind greeted this visitor. Under one of them, Photon found a **chest**! Could there be a real treasure inside?*

**Activity:**

Start by reading short stories to the children. This could be stories about sea voyages in a foreign language they are currently learning. Each story should mention the objects present on the map and other details (colours, sounds) for later tasks with the Photon Robot.

Then instruct the students to direct the Photon Robot to the field on the mat that contains the item from the story. To do this, instruct the children to program the robot accordingly, including the use of its lights and sounds.

Students say the word that describes the item they have memorised and indicate which other words from the story match the word after directing the robot to the appropriate square. As a means of help, you can read the story again.

You can combine this activity with a pronunciation activity, e.g., practising words that differ in pronunciation by only one sound, such as shark – sharp.

## 9. A concert at sea

### Goal:

- To understand the diversity of marine life
- To develop or improve musical skills

### Required items:

- Marine animals sounds – you need to upload them to the Photon Robot

### Activity:

Remember to upload the necessary sounds to the robot's internal memory before the class. Explain to the students that sea creatures produce a variety of distinct sounds (for example, the "singing" of a whale or the sounds of a dolphin) and introduce them to the prepared recordings.

The task here is to program the Photon Robot. It should move to fields with specific marine animals and then mimic their sounds. Encourage the children to create their own sea concert or melody made up of different sounds.

## 10. Ahoy, weather!

### Goal:

- To understand the basics of meteorology and the impact of weather on the sea

### Activity:

Explain how the weather affects the sea. Then explain that the children will need to program the robot to monitor different weather conditions over the sea (e.g., storms, winds, heat waves).

Whenever the Photon Robot visits these areas on the mat, it should change the colour of the ears backlight (e.g., red when it's hot or blue when it's stormy or freezing).